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Technical Memorandum

To: Tim Crowley
Public Works, City of Hamilton

From: Lance Lumbard; Suzy Baird; Michael Coveney, PhD
Wood Environment & Infrastructure Solutions (Wood)

Date: September 17, 2021

Ref: WW20101062 City of Hamilton – Chedoke Creek Remediation Project

Re: Comparison of Sediment Contaminants in Surficial and Deep Layers in Chedoke Creek and Princess Point Sediment Cores and Recommended Dredge Target Modifications

1.0 INTRODUCTION

This technical memorandum provides a comparison of select sediment contaminants in existing surficial soft sediments and deep firm sediment layers that may be exposed following dredging within Chedoke Creek and the Princess Point Embayment. The existing surficial sediments in these areas show some metal concentrations that exceed the Provincial Sediment Quality Guidelines (PSQG) Severe Effect Levels (SELs) or the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CSQG) Probable Effect Levels (PELs). Examples are nickel at multiple sites, and cadmium, zinc, mercury, and lead at several locations. This information is summarized in the previous technical memorandum titled "Evaluation of Chedoke Creek and Princess Point Sediment Cores and Preliminary Estimate of In-Situ Total Phosphorus and Total Nitrogen Mass, City of Hamilton" and dated July 7, 2021. The focus of this comparison is to determine whether removal of sediment to a particular depth will leave a new surface sediment that 1) is similar in its contamination profile to the original sediment, 2) shows less-severe contamination, or 3) shows more-severe contamination. The information in this technical memorandum is supplemental to the previous technical memorandum (referenced above, dated July 7, 2021) and includes recommendations about locations and depths of potential sediment removal operations.

2.0 METHODS

Soft sediment cores were collected using a piston tube sampler and sectioned for analyses as described in the July 7, 2021 technical memo. During the April 2021 sampling effort, five sediment core intervals including 0-15 cm, 15-30 cm, 30-45 cm, 30-45 cm, and 45-60 cm were collected for the majority of locations shown in Figure 1. Analysis of these samples indicated that additional samples were needed from deeper intervals at select locations. Wood collected the deeper core samples in August 2021 using a hand auger beginning at the subsequent depth interval where the piston core samples terminated at select locations in Chedoke Creek. In addition, new soft sediment cores were collected at two new locations in Princess Point, and at two new locations in Cootes Paradise (Figure 1). Depth intervals were not identical at each location because samplers encountered hard substrate, likely gravel or rocks, in some areas. Samples were submitted to the analytical laboratory, Bureau Veritas, for analysis of metals and polycyclic aromatic hydrocarbons (PAHs).

Contaminant concentrations in the surficial intervals (April 2021) were compared to contaminant concentrations in deeper intervals (August 2021 for Chedoke Creek and April and August 2021 for Princess Point). We analyzed data for potentially toxic metals and PAHs. In addition to examining concentrations, we normalized concentrations with respect to potential toxicity by calculating hazard quotients (HQs), the ratio of the concentration of a substance to its environmental quality guideline. We compared concentrations to two quality guidelines: the PSQG SEL¹ and the CSQG PEL². A sediment concentration exceeding the SEL (HQ > 1) is considered heavy contamination.¹ The SEL was derived from long-term effects that the contaminant may have on sediment organisms. A sediment concentration exceeding the PEL (HQ > 1) is frequently associated with adverse biological effects for aquatic life.² We emphasize that because the SEL and PEL are high-level guidelines, even low values could indicate risk to sensitive organisms. We chose these quality guidelines for comparison because of the known existing contamination of surficial sediments in these areas. We wanted to examine the potential for improvement or worsening of the current contamination levels if sediments were removed.

3.0 RESULTS

3.1 PAHs

PAH compounds showed low concentrations at both Chedoke Creek and Princess Point sites (Appendix A and Appendix B). We calculated HQs using SEL and PEL guidelines as described above, and no samples in either area exceeded either of these guidelines. The maximum HQ for both SEL

¹ Provincial Sediment Quality Guidelines (PSQGs) – Ontario, available at: <https://www.ontario.ca/document/guidelines-identifying-assessing-and-managing-contaminated-sediments-ontario/identification-and-assessment> (accessed September 2021)

² Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CSQG), available at: <https://ccme.ca/en/resources/sediment> (accessed September 2021)

and PEL in all PAH samples was 0.011 for Chedoke Creek and 0.02 for Princess Point. We also examined HQs for PAH values using a much lower sediment quality guideline – the PSQG Lowest Effect Level (LEL)¹. The LEL indicates a sediment concentration that can be tolerated by the majority of sediment-dwelling organisms. As concentrations exceed LELs, sensitive organisms are expected to be affected. A significant number of PAH values exceeded the LELs, especially for Princess Point samples. However, these levels of PAHs are not unexpected in an industrial setting. We used the higher-level guidelines SEL and PEL for PAHs as we did for metals for consistency and to reflect the industrial nature of the Chedoke Creek watershed. As stated above, we found no exceedances of SEL or PEL for PAHs. Because PAH concentrations were much lower than their SELs and PELs compared to metals, only metal data will be used to refine dredge targets as discussed below.

3.2 CHEDOKE CREEK METALS

Chedoke Creek metals concentrations with comparison to HQs based on the SELs and PELs are included below for the surficial (0-15 cm) sample and deep sample intervals collected at select locations. The raw sample concentration data is included in Appendix A (April 2021 data) and Appendix B (August 2021 data). Tables 1 and 2 below show metals HQs, with light green indicating HQs < 0.5, darker green indicating HQs between 0.5 and 1 ($0.5 \leq \text{HQ} \leq 1.0$), and orange indicating HQs greater than 1.0.

3.2.1 SEL HQs

Hazard quotients calculated using SELs for Chedoke Creek metal concentrations are included in Table 1. The nickel HQs were the most common HQs greater than 1.0.

3.2.2 PEL HQs

Hazard quotients calculated using PELs for Chedoke Creek metal concentrations are included in Table 2. HQs exceeded 1 for cadmium, lead, mercury and zinc; no PEL is available for nickel.

3.3 PRINCESS POINT METALS

Princess Point metals concentrations with comparison to HQs based on the SELs and PELs are included below. The raw sample concentration data is included in Appendix A (April 2021 data) and Appendix B (August 2021 data). Tables 3 and 4 below show metals HQs, with light green indicating HQs < 0.5, darker green indicating HQs between 0.5 and 1 ($0.5 \leq \text{HQ} \leq 1.0$), and orange indicating HQs greater than 1.0.

3.3.1 SEL HQs

Hazard quotients calculated using SELs for Princess Point metal concentrations are included in Table 3. Like in the Chedoke Creek samples, the nickel HQ was frequently greater than 1. Other metals producing HQs > 1 included cadmium, chromium, copper, nickel, and zinc. Lead and mercury HQs exceeded 1 at only one location (PP-C21).

3.3.2 PEL HQs

Hazard quotients calculated using PELs for Princess Point metal concentrations are included in Table 4. HQs exceeded 1 for cadmium, chromium, copper, lead, mercury, and zinc (no PEL is available for nickel).

Table 1 – Chedoke Creek Metal SEL HQs

Location	Interval (cm)	HQ (SEL)							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
CC-C13	0-15	0.1	0.1	0.2	0.5	0.1	0.0	1.2	0.3
	75-90	0.2	0.6	0.3	0.7	0.7	0.1	5.3	0.6
	90-105	0.2	0.1	0.3	0.6	0.2	0.0	1.7	0.4
CC-C17	0-15	0.1	0.1	0.2	0.7	0.1	0.0	1.2	0.3
	75-90	0.1	0.1	0.1	0.3	0.1	0.0	0.7	0.1
CC-C19	0-15	0.2	1.5	0.4	0.8	0.5	0.1	2.2	0.5
	75-90	0.1	1.1	0.3	0.8	0.3	0.1	1.9	0.3
	90-105	0.2	1.1	0.3	0.9	0.3	2.3	1.8	0.3
CC-C20	0-15	0.2	3.0	0.6	1.2	0.6	0.2	3.4	0.5
	105-120	0.2	1.0	0.3	0.7	0.4	0.1	1.8	0.3
	120-135	0.1	0.8	0.2	0.6	0.4	0.1	1.5	0.3
CC-C23	0-15	0.1	0.0	0.2	0.4	0.2	0.6	1.1	0.2
	105-120	0.1	0.3	0.2	0.6	0.3	0.5	1.8	0.3
	120-135	0.1	0.3	0.2	0.8	0.5	0.1	2.1	0.3
CC-C26	0-15	0.1	0.1	0.2	0.8	0.3	0.1	0.7	0.2
	105-120	0.1	0.3	0.2	0.6	0.4	1.0	1.4	0.3
	120-135	0.1	0.4	0.2	0.6	0.4	0.2	1.8	0.3

Table 2 – Chedoke Creek Metal PEL HQs

Location	Interval (cm)	HQ (PEL)							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
CC-C13	0-15	0.3	0.2	0.3	0.3	0.4	0.2	NO PEL AVAILABLE	0.7
	75-90	0.4	1.6	0.4	0.4	1.9	0.5		1.6
	90-105	0.4	0.1	0.3	0.3	0.6	0.2		0.9
CC-C17	0-15	0.2	0.3	0.3	0.4	0.3	0.2		0.7
	75-90	0.1	0.4	0.1	0.2	0.3	0.1		0.2
CC-C19	0-15	0.3	4.3	0.4	0.5	1.3	0.6		1.2
	75-90	0.3	3.1	0.3	0.4	0.8	0.5		0.9
	90-105	0.3	3.1	0.4	0.5	0.8	9.5		0.8
CC-C20	0-15	0.4	8.6	0.7	0.7	1.5	0.9		1.4
	105-120	0.3	2.7	0.3	0.4	1.0	0.6		0.8
	120-135	0.3	2.2	0.3	0.4	1.0	0.3		0.8
CC-C23	0-15	0.2	0.1	0.2	0.2	0.6	2.5		0.6
	105-120	0.3	0.9	0.3	0.3	0.7	2.1		0.7
	120-135	0.3	0.9	0.3	0.4	1.3	0.4		0.7
CC-C26	0-15	0.2	0.2	0.2	0.5	0.8	0.2		0.6
	105-120	0.2	0.8	0.3	0.3	1.2	4.1	0.7	
	120-135	0.3	1.1	0.3	0.4	1.2	0.6	0.8	

Table 3 – Princess Point Metal SEL HQs

Location	Interval (cm)	HQ (SEL)							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
PP-C01	0-15	0.1	0.1	0.3	0.7	0.2	0.1	1.3	0.5
PP-C01	15-30	0.1	0.1	0.2	0.5	0.2	0.1	1.2	0.4
PP-C01	30-45	0.1	0.1	0.2	0.6	0.3	0.2	1.2	0.3
PP-C01	45-60	0.1	0.2	0.3	0.5	0.4	0.2	1.5	0.3
PP-C02	0-15	0.1	0.1	0.1	0.6	0.1	0.1	0.8	0.2
PP-C02	15-30	0.1	0.1	0.2	0.6	0.2	0.1	1.1	0.3
PP-C02	30-45	0.1	0.1	0.2	0.7	0.4	0.1	1.3	0.3
PP-C03	0-15	0.1	0.1	0.1	0.5	0.2	0.0	0.9	0.2
PP-C03	15-30	0.1	0.1	0.2	0.6	0.3	0.3	1.0	0.3
PP-C03	30-45	0.1	0.1	0.2	0.5	0.4	0.2	1.3	0.3
PP-C03	45-60	0.1	0.2	0.2	0.6	0.3	0.3	1.2	0.2
PP-C03	60-75	0.3	4.0	0.8	1.5	0.8	0.5	4.6	0.9
PP-C03	75-90	0.2	3.7	0.7	1.5	0.6	0.3	2.8	0.7
PP-C04	0-15	0.1	0.1	0.3	0.8	0.2	0.1	1.3	0.5
PP-C04	15-30	0.2	0.1	0.2	0.5	0.2	0.1	1.2	0.4
PP-C04	30-45	0.1	0.1	0.2	0.5	0.2	0.1	1.2	0.3
PP-C04	45-60	0.2	0.2	0.3	0.7	0.5	0.2	1.6	0.4
PP-C05	0-15	0.1	0.1	0.3	0.8	0.2	0.1	1.4	0.5
PP-C05	15-30	0.2	0.1	0.2	0.5	0.2	0.1	1.2	0.4
PP-C05	30-45	0.1	0.1	0.2	0.5	0.3	0.1	1.2	0.3
PP-C05	45-60	0.2	0.4	0.4	0.9	0.6	0.2	2.1	0.6
PP-C06	0-15	0.1	0.1	0.3	0.7	0.2	0.1	1.4	0.5
PP-C06	15-30	0.1	0.1	0.2	0.5	0.2	0.1	1.2	0.4
PP-C06	30-45	0.2	0.3	0.3	0.7	0.4	0.2	1.6	0.5
PP-C06	45-60	0.3	2.2	0.5	0.9	0.8	0.2	3.9	0.7
PP-C06	60-75	0.2	1.8	0.4	0.9	0.6	0.4	3.5	0.6
PP-C07	0-15	0.1	0.1	0.2	0.5	0.1	0.1	1.2	0.4
PP-C07	15-30	0.1	0.1	0.2	0.5	0.2	0.1	1.1	0.3
PP-C07	30-45	0.1	0.1	0.2	0.6	0.2	0.1	1.2	0.4
PP-C07	45-60	0.1	0.1	0.2	0.5	0.3	0.3	1.2	0.3
PP-C07	60-75	0.1	0.1	0.2	0.5	0.3	0.2	1.2	0.3
PP-C08	0-15	0.1	0.1	0.2	0.5	0.1	0.0	1.0	0.3
PP-C08	15-30	0.1	0.1	0.1	0.4	0.1	0.0	0.8	0.2
PP-C08	30-45	0.1	0.1	0.2	0.4	0.2	0.0	0.9	0.2
PP-C08	45-60	0.1	0.1	0.2	0.4	0.2	0.2	1.0	0.2
PP-C09	0-15	0.2	0.1	0.3	0.6	0.2	0.1	1.3	0.5
PP-C09	15-30	0.2	0.2	0.3	0.7	0.2	0.2	1.4	0.5
PP-C09	30-45	0.2	0.2	0.3	0.6	0.3	0.2	1.4	0.4
PP-C09	45-60	0.2	0.2	0.3	0.7	0.5	0.2	1.8	0.5
PP-C09	60-75	0.2	0.6	0.5	1.2	0.7	0.2	2.4	0.7
PP-C11	0-15	0.2	0.2	0.3	0.8	0.2	0.1	1.6	0.6
PP-C11	15-30	0.2	0.3	0.3	0.8	0.3	0.1	1.7	0.6
PP-C11	30-45	0.2	0.4	0.4	1.0	0.5	0.2	2.1	0.7
PP-C11	45-60	0.2	2.4	0.7	1.4	0.7	0.3	4.2	0.8
PP-C11	60-75	0.3	5.3	1.0	1.9	0.8	0.5	4.1	1.2
PP-C11	75-90	0.3	4.8	1.4	1.7	0.7	0.4	4.0	1.2
PP-C12	0-15	0.1	0.1	0.2	0.5	0.2	0.4	1.1	0.3
PP-C12	15-30	0.1	0.1	0.2	0.4	0.2	0.1	1.1	0.3
PP-C12	30-45	0.1	0.1	0.2	0.5	0.2	0.2	1.1	0.3
PP-C20	0-15	0.2	0.3	0.4	0.9	0.3	0.1	1.7	0.7
PP-C20	15-30	0.2	0.8	0.5	1.1	0.5	0.2	2.4	0.7
PP-C20	30-45	0.2	2.6	0.8	1.6	0.8	0.3	4.2	1.0
PP-C20	45-60	0.3	5.4	1.7	2.4	0.8	0.5	4.5	1.5
PP-C20	60-75	0.2	2.3	0.9	1.5	0.6	0.3	3.0	1.0
PP-C21	0-15	0.2	2.2	0.8	2.1	0.6	0.4	2.8	1.1
PP-C21	15-30	0.4	5.0	1.8	4.6	1.2	1.1	4.4	2.7
PP-C21	30-45	0.3	0.4	0.3	1.2	0.7	0.9	1.9	1.2
PP-C21	45-60	0.2	1.0	0.5	1.3	0.4	0.4	2.1	0.9

Table 4 – Princess Point Metal PEL HQs

Location	Interval (cm)	HQ (PEL)							Nickel	Zinc
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury			
PP-C01	0-15	0.3	0.3	0.3	0.4	0.4	0.3		1.2	
PP-C01	15-30	0.3	0.3	0.3	0.3	0.5	0.3		1.0	
PP-C01	30-45	0.3	0.4	0.3	0.3	0.8	0.7		0.9	
PP-C01	45-60	0.3	0.4	0.3	0.3	1.0	0.6		0.9	
PP-C02	0-15	0.2	0.2	0.2	0.3	0.3	0.6		0.6	
PP-C02	15-30	0.2	0.3	0.3	0.3	0.6	0.3		0.7	
PP-C02	30-45	0.2	0.3	0.3	0.4	1.1	0.6		0.8	
PP-C03	0-15	0.2	0.2	0.2	0.3	0.4	0.1		0.5	
PP-C03	15-30	0.2	0.3	0.2	0.3	0.8	1.0		0.7	
PP-C03	30-45	0.2	0.4	0.2	0.3	1.1	0.9		0.8	
PP-C03	45-60	0.2	0.6	0.2	0.3	0.9	1.3		0.6	
PP-C03	60-75	0.5	11.4	1.0	0.9	2.3	1.9		2.4	
PP-C03	75-90	0.4	10.6	0.9	0.9	1.8	1.4		1.9	
PP-C04	0-15	0.3	0.2	0.3	0.4	0.4	0.3		1.2	
PP-C04	15-30	0.3	0.3	0.3	0.3	0.4	0.2		0.9	
PP-C04	30-45	0.3	0.3	0.3	0.3	0.7	0.6		0.9	
PP-C04	45-60	0.3	0.7	0.4	0.4	1.4	0.9		1.1	
PP-C05	0-15	0.3	0.3	0.3	0.5	0.5	0.4		1.2	
PP-C05	15-30	0.3	0.3	0.3	0.3	0.5	0.4		1.0	
PP-C05	30-45	0.3	0.3	0.3	0.3	0.7	0.5		0.9	
PP-C05	45-60	0.4	1.1	0.5	0.5	1.8	1.0		1.5	
PP-C06	0-15	0.3	0.3	0.3	0.4	0.5	0.2		1.2	
PP-C06	15-30	0.3	0.3	0.3	0.3	0.5	0.5		1.0	
PP-C06	30-45	0.3	0.9	0.4	0.4	1.2	0.8		1.2	
PP-C06	45-60	0.5	6.3	0.6	0.5	2.1	1.0		1.8	
PP-C06	60-75	0.4	5.1	0.5	0.5	1.8	1.5		1.6	
PP-C07	0-15	0.3	0.2	0.3	0.3	0.4	0.2		1.0	
PP-C07	15-30	0.3	0.3	0.3	0.3	0.4	0.2		0.8	
PP-C07	30-45	0.3	0.3	0.3	0.3	0.6	0.4		0.9	
PP-C07	45-60	0.2	0.3	0.3	0.3	0.7	1.0		0.7	
PP-C07	60-75	0.2	0.3	0.3	0.3	0.9	0.6		0.7	
PP-C08	0-15	0.2	0.2	0.2	0.3	0.3	0.2		0.7	
PP-C08	15-30	0.2	0.1	0.2	0.2	0.4	0.2		0.5	
PP-C08	30-45	0.2	0.2	0.2	0.2	0.4	0.2		0.5	
PP-C08	45-60	0.2	0.3	0.2	0.2	0.6	0.8		0.6	
PP-C09	0-15	0.3	0.4	0.3	0.3	0.5	0.3		1.2	
PP-C09	15-30	0.3	0.5	0.4	0.4	0.7	0.7		1.2	
PP-C09	30-45	0.3	0.5	0.3	0.4	0.8	0.8		1.0	
PP-C09	45-60	0.3	0.5	0.4	0.4	1.4	0.8		1.3	
PP-C09	60-75	0.4	1.7	0.6	0.7	2.0	1.0		1.9	
PP-C11	0-15	0.3	0.6	0.4	0.5	0.6	0.3		1.6	
PP-C11	15-30	0.4	0.8	0.4	0.5	0.8	0.5		1.5	
PP-C11	30-45	0.4	1.2	0.5	0.6	1.4	0.8		1.7	
PP-C11	45-60	0.5	6.9	0.9	0.8	1.9	1.2		2.1	
PP-C11	60-75	0.6	15.1	1.2	1.1	2.3	1.9		3.2	
PP-C11	75-90	0.5	13.7	1.7	1.0	1.9	1.6		3.1	
PP-C12	0-15	0.2	0.2	0.3	0.3	0.5	1.6		0.9	
PP-C12	15-30	0.2	0.3	0.2	0.2	0.4	0.2		0.7	
PP-C12	30-45	0.2	0.3	0.3	0.3	0.5	0.8		0.9	
PP-C20	0-15	0.4	1.0	0.4	0.5	0.7	0.5		1.7	
PP-C20	15-30	0.4	2.4	0.6	0.6	1.3	0.8		1.9	
PP-C20	30-45	0.5	7.4	1.0	0.9	2.1	1.2		2.6	
PP-C20	45-60	0.6	15.4	2.1	1.3	2.2	2.1		3.8	
PP-C20	60-75	0.5	6.6	1.0	0.9	1.5	1.2		2.5	
PP-C21	0-15	0.4	6.3	1.0	1.2	1.6	1.7		2.9	
PP-C21	15-30	0.7	14.3	2.2	2.6	3.3	4.5		7.0	
PP-C21	30-45	0.5	1.1	0.4	0.7	1.9	3.7		3.2	
PP-C21	45-60	0.4	2.9	0.6	0.7	1.2	1.6		2.3	

NO PEL AVAILABLE

4.0 SUMMARY

For Chedoke Creek, Wood examined the pattern of exceedances of SEL or PEL metal guidelines and selected the optimal dredge target elevation for sediment removal based on exceedance values. The optimal exposed new sediment layer interval varied from 75 – 90 cm to 120 – 135 cm at various sites (Table 5). We assessed the overall effect of removal of sediment to target depths by comparing numbers of exceedances of the SEL and PEL guidelines for existing surficial soft sediments and for the new firm sediment layer at the proposed dredging target elevations. For Chedoke Creek, this comparison showed a potential decline in total SEL/PEL exceedances from fifteen to twelve (Table 6)

For Princess Point sites, total exceedances increased with the proposed sediment removal. Wood evaluated two target dredging depths: exposing the 30 - 45 cm interval and exposing the 45 - 60 cm interval. For Princess Point, the comparison of total SEL/PEL exceedances at the existing surface (0 – 15 cm) versus the 30 – 45 cm interval showed a potential increase from 27 to 33 (Table 7). Exposing the 45 – 60 cm sediment interval increased potential SEL/PEL exceedances from 25 to 45 (Table 8) (the number of surficial, baseline exceedances in these two cases changed because fewer sites were available with data at 45 – 60 cm). Metal concentrations within the new locations collected at PP-C20 and PP-C21 were among the highest of any locations collected from the Princess Point embayment.

Table 9 includes metal and PAHs concentrations from the additional samples collected in Cootes Paradise near the fishway in August 2021 (Figure 1). Raw data is included in Appendix B. Although the concentrations of metals and PAHs at these locations do not appear to preclude dredging, dredging in this area would not be economical given the distance to the dredge material management area.

Table 5 – Chedoke Creek Target Exposed Intervals

Location	Target Exposed Interval
CC-C13	90-105
CC-C17	75-90
CC-C19	75-90
CC-C20	105-120
CC-C23	120-135
CC-C26	120-135

Table 6 – Count of SEL and PEL Exceedances in Chedoke Creek Existing Surficial Interval and Target Exposed Intervals

Interval	Count
Existing Surficial Interval	15
Target Exposed Interval	12

Table 7 – Count of SEL and PEL Exceedances in Princess Point in 0 – 15 cm and 30 – 45 cm Intervals

Interval (cm)	Count
0 – 15	27
30 – 45	33

Table 8 – Count of SEL and PEL Exceedances in Princess Point in 0 – 15 cm and 45 – 60 cm Intervals

Interval (cm)	Count
0 – 15	25
45 – 60	45

Table 9 – Metal and PAH Concentrations in Cootes Paradise Samples Collected in August 2021

Analyte	Sample Location								
	CP-C09-0-15	CP-C09-15-30	CP-C09-30-45	CP-C09-45-60	CP-C09A-60-75	CP-C10-0-15	CP-C10-15-30	CP-C10-30-45	CP-C10-45-60
Metals (ug/g)									
Arsenic	5	5.8	6.2	5.9	5.8	4.6	5.8	5.9	5.4
Cadmium	1	1.2	1.8	1.2	1.4	0.77	0.93	1.2	1.1
Chromium	26	28	30	28	28	24	26	26	25
Copper	59	57	65	58	60	53	52	52	52
Lead	44	54	90	55	68	40	42	57	49
Mercury	0.084	0.15	0.26	0.16	0.22	0.091	0.12	0.14	0.11
Nickel	24	24	27	25	25	22	25	25	24
Zinc	350	340	360	340	340	320	320	310	310
PAHs (ug/g)									
Acenaphthene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Acenaphthylene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Anthracene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Benzo(a)anthracene	0.29	0.31	0.25	0.3	0.37	0.18	0.17	0.27	0.22
Benzo(a)pyrene	0.39	0.41	0.29	0.4	0.43	0.23	0.2	0.31	0.28
Benzo(ghi)perylene	0.43	0.36	0.25	0.35	0.36	0.21	0.2	0.26	0.26
Benzo(k)fluoranthene	0.2	0.22	0.16	0.21	0.22	<0.15	0.12	0.17	0.15
Chrysene	0.33	0.39	0.3	0.38	0.43	0.21	0.18	0.3	0.27
Dibenzo(a,h)anthracene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Fluoranthene	0.93	0.95	0.75	0.9	1.1	0.53	0.47	0.78	0.63
Fluorene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Indeno(1,2,3-cd)pyrene	0.41	0.37	0.26	0.36	0.36	0.21	0.2	0.28	0.26
1-Methylnaphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
2-Methylnaphthalene	<0.20	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Naphthalene	<0.10	<0.10	<0.10	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10
Phenanthrene	0.22	0.27	0.32	0.24	0.44	<0.15	0.13	0.34	0.19
Pyrene	0.75	0.77	0.6	0.73	0.89	0.42	0.38	0.61	0.52

5.0 RECOMMENDATIONS

Revised dredging recommendations for Chedoke Creek and Princess Point are included below. These recommendations supersede the recommendations included in the previous technical memorandum titled "Evaluation of Chedoke Creek and Princess Point Sediment Cores and Preliminary Estimate of In-Situ Total Phosphorus and Total Nitrogen Mass, City of Hamilton" and dated July 7, 2021.

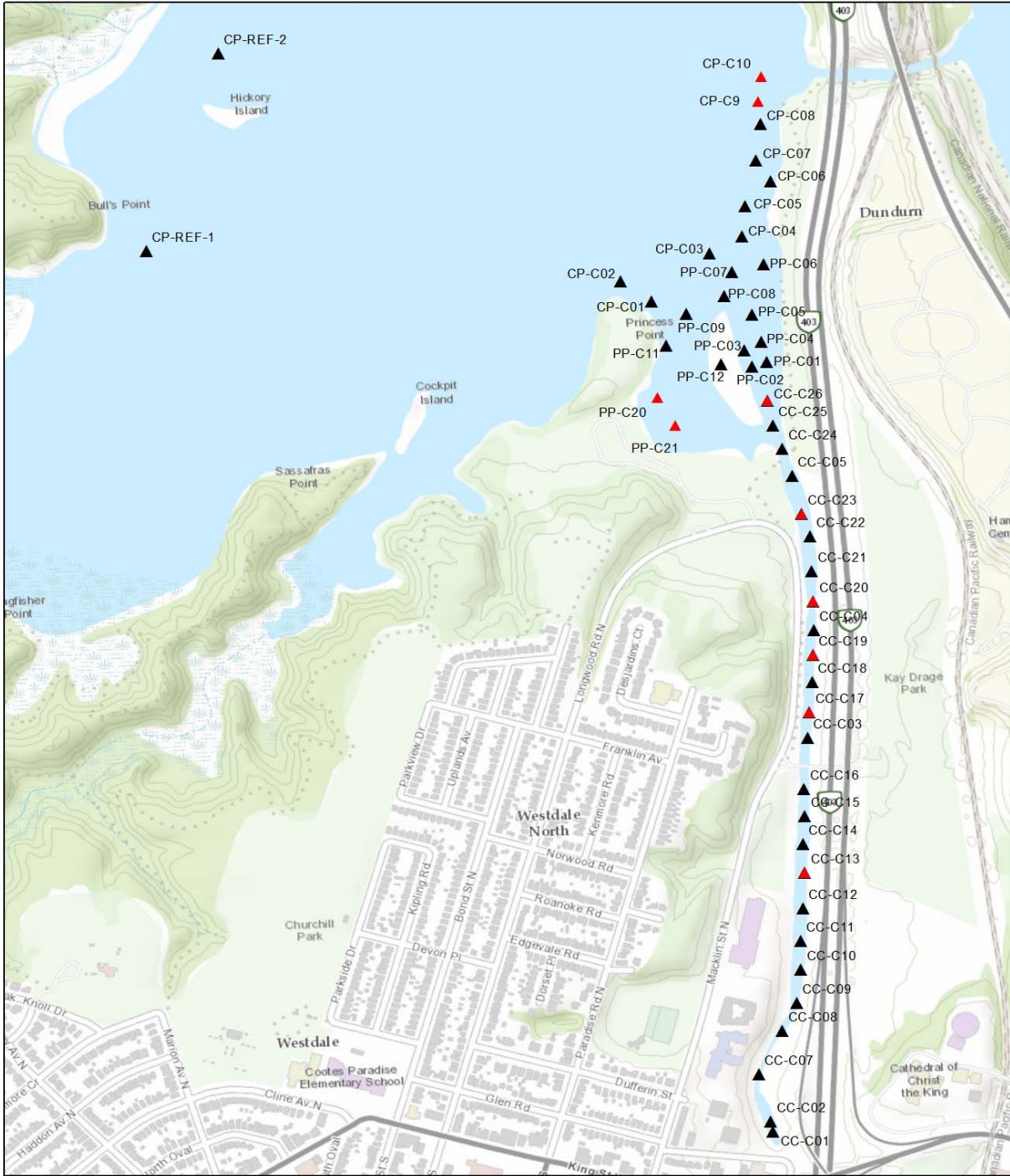
Recommendations for Chedoke Creek:

- Proceed with dredging in zones 2 and 3 as shown in Figure 2.
- Target dredge elevations for sediment removal will be determined using the top of the exposed target interval shown in Table 5.

Recommendations for Princess Point:

- Dredging is not recommended in zones 4 or 5 due to underlying metal contaminants.
- Sediments near the fishway may be suitable for dredging as part of future restoration efforts, but the distance from this site to the dredge material management area is cost prohibitive.

Revised material quantities and load reductions associated with the revised dredge template will be provided with the 90% design plans. While removal of the Princess Point embayment from the dredge template reduces the potential mass reductions stated in the previous technical memorandum, dredging to deeper target depths within Chedoke Creek should provide at least 50% of the maximum total phosphorus and total Kjeldahl nitrogen load reduction estimates and is consistent with the original concept plan for targeted dredging within Chedoke Creek.



<p>Data sources: ESRI, USGS, Wood 2021</p> <p>Created by: SB Checked by: LL</p>	<p>Legend</p> <ul style="list-style-type: none"> ▲ Sediment Sample Locations (April 2021) ▲ Sediment Sample Locations (August 2021) <p>0 0.125 0.25 0.5 Kilometers</p>	<p>Sediment Sample Locations</p>
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Figure 1. Chedoke Creek, Cootes Paradise, and Princess Point Sediment Sample Locations



Figure 2. Recommended Dredge Zones

Appendix A

Sediment Analysis Results Tables – April 2021

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C08			CC-C09	CC-C10			CC-C11							
Sample ID	CC-C08WEST-15-30	CC-C08WEST-30-45	CC-C08CENTRE-0-15	CC-C09-EAST-0-15	CC-C10-CENTRE-0-15	CC-C10-EAST-0-15	CC-C11-WEST-0-15	CC-C11-WEST-15-30	CC-C11-CENTRE-0-15	CC-C11-CENTRE-15-30	CC-C11-CENTRE-30-45	CC-C11-CENTRE-45-60	CC-C11-EAST-0-15	CC-C12WEST-0-15	
BV Labs Sample ID	PGU180	PGU181	PGU178	PHJ586	PHJ588	PHJ587	PHJ594	PHJ595	PHJ590	PHJ591	PHJ592	PHJ593	PHJ589	PGU172	
Matrix	Sediment	Sediment	Sediment	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Sediment	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/8/21 8:30	4/8/21 8:30	4/8/21 12:45	4/9/21 9:10	4/9/21 9:50	4/9/21 10:10	4/9/21 10:45	4/9/21 10:45	4/9/21 12:00	4/9/21 12:00	4/9/21 12:00	4/9/21 12:00	4/9/21 13:12	4/7/21 12:25	
Parameter Name	Units														
PHYSICAL															
Moisture	%	28	19	17	19	20	18	44	22	16	19	29	30	17	45
ANIONS & NUTRIENTS															
Total Ammonia-N	ug/g	<20	26	<20	<20	<20	<20	167	129	<20	<20	<20	<20	<20	139
Nitrogen (N)	%	0.08	0.03	0.034											0.2
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	803	298	339	570	269	241	2230	754	344	258	801	919	269	1960
Nitrite (N)	ug/g	<0.5	<0.5	<0.5											<0.5
Nitrate (N)	ug/g	<2	<2	<2											<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3											<3
METALS															
Acid Extractable Aluminum (Al)	ug/g	9400	11000	9400	8000	9000	8400	10000	7400	8300	8800	12000	16000	8700	10000
Acid Extractable Antimony (Sb)	ug/g	0.59	<0.20	0.38	0.7	3.4	0.46	0.9	0.63	0.38	1.2	5.1	2	1.2	1
Acid Extractable Arsenic (As)	ug/g	7.1	4.8	4.4	4	5.6	6.9	4.5	4.1	4.4	6.5	6.8	5.3	5.5	4.6
Acid Extractable Barium (Ba)	ug/g	80	76	190	70	130	86	120	92	130	140	190	190	87	120
Acid Extractable Beryllium (Be)	ug/g	0.5	0.55	0.51	0.42	0.54	0.48	0.55	0.44	0.48	0.56	0.71	0.82	0.45	0.57
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	1.1
Acid Extractable Boron (B)	ug/g	14	8.3	24	12	20	17	23	18	18	20	32	16	17	22
Acid Extractable Cadmium (Cd)	ug/g	0.47	0.11	0.48	0.23	0.67	0.61	0.65	0.45	0.65	1.4	25	13	0.83	0.68
Acid Extractable Calcium (Ca)	ug/g	71000	87000	64000	66000	71000	79000	66000	72000	71000	66000	48000	20000	65000	64000
Acid Extractable Chromium (Cr)	ug/g	21	18	22	15	27	21	27	22	21	27	39	33	19	28
Acid Extractable Cobalt (Co)	ug/g	8.6	11	9.3	7.1	8.7	8	8.5	6.8	7.6	10	16	13	7.6	8.7
Acid Extractable Copper (Cu)	ug/g	39	32	59	33	130	58	84	65	59	89	140	62	40	90
Acid Extractable Iron (Fe)	ug/g	23000	25000	28000	18000	29000	23000	23000	21000	25000	30000	25000	26000	25000	23000
Acid Extractable Lead (Pb)	ug/g	23	12	42	20	74	21	40	31	50	260	120	59	94	38
Acid Extractable Magnesium (Mg)	ug/g	18000	14000	25000	17000	22000	24000	25000	23000	25000	20000	14000	7700	17000	25000
Acid Extractable Manganese (Mn)	ug/g	530	680	590	510	630	600	540	530	520	690	570	350	580	540
Acid Extractable Molybdenum (Mo)	ug/g	1.1	<0.50	0.92	0.74	1	0.81	1.2	0.87	0.92	1	0.88	0.51	0.95	1.4
Acid Extractable Nickel (Ni)	ug/g	20	23	22	17	21	19	22	18	19	27	51	41	19	25
Acid Extractable Phosphorus (P)	ug/g	730	780	930	780	870	780	1200	960	910	960	1400	1000	980	1300
Acid Extractable Potassium (K)	ug/g	1900	2000	2400	1600	2100	1900	2200	1700	1700	1800	2000	2200	1500	2200
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.55
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	4.4	0.22	0.51	<0.20	<0.20	0.56	3.6	1.3	2.8	1
Acid Extractable Sodium (Na)	ug/g	180	200	280	560	670	290	370	180	270	200	250	170	320	470
Acid Extractable Strontium (Sr)	ug/g	130	160	97	140	96	100	120	120	95	92	88	48	120	120
Acid Extractable Thallium (Tl)	ug/g	0.15	0.11	0.11	0.096	0.1	0.098	0.18	0.11	0.1	0.094	0.14	0.14	0.099	0.2
Acid Extractable Tin (Sn)	ug/g	1.6	<1.0	1.2	2.8	11	4	4.6	4.8	2	49	20	9.2	11	4.2
Acid Extractable Uranium (U)	ug/g	0.91	0.61	0.56	0.52	0.59	0.7	0.68	0.6	0.53	0.73	0.83	0.52	0.66	
Acid Extractable Vanadium (V)	ug/g	23	24	25	20	26	22	24	21	24	25	27	29	22	24
Acid Extractable Zinc (Zn)	ug/g	220	66	270	130	340	270	340	230	260	250	400	210	210	370
Acid Extractable Mercury (Hg)	ug/g	0.072	<0.050	<0.050	0.053	11	0.1	0.1	0.051	0.49	1	0.58	0.16	0.061	0.67
PAHs															
Acenaphthene	ug/g	<0.050	<0.0050	<0.050	<0.050	0.06	<0.050	<0.10	<0.050	<0.050	0.062	0.1	0.16	<0.050	<0.10
Acenaphthylene	ug/g	<0.050	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	0.051	<0.050	<0.10
Anthracene	ug/g	<0.050	<0.0050	<0.050	0.066	0.085	<0.050	0.15	0.091	<0.050	0.077	0.26	0.26	0.057	0.11
Benzo(a)anthracene	ug/g	0.21	0.0064	0.13	0.27	0.37	<0.050	0.61	0.34	<0.050	0.12	0.38	0.98	0.11	0.56
Benzo(a)pyrene	ug/g	0.23	0.0071	0.12	0.28	0.36	<0.050	0.78	0.38	<0.050	0.09	0.35	1.1	0.096	0.67
Benzo(b,j)fluoranthene	ug/g	0.38	0.014	0.16	0.44	0.54	<0.050	1.3	0.6	0.093	0.13	0.52	1.5	0.14	0.96
Benzo(g,h,i)perylene	ug/g	0.21	0.0091	0.083	0.19	0.27	<0.050	0.68	0.32	0.05	0.061	0.25	0.7	0.068	0.5
Benzo(k)fluoranthene	ug/g	0.11	<0.0050	0.06	0.15	0.19	<0.050	0.43	0.19	<0.050	0.19	0.53	0.53	0.052	0.33
Chrysene	ug/g	0.22	0.011	0.13	0.31	0.36	<0.050	0.89	0.38	0.064	0.11	0.34	0.78	0.099	0.69
Dibenzo(a,h)anthracene	ug/g	<0.050	<0.0050	<0.050	<0.050	0.056	<0.050	0.12	0.053	<0.050	<0.050	0.055	0.22	<0.050	<0.10
Fluoranthene	ug/g	0.74	0.027	0.34	0.87	1.3	0.05	2.7	1.2	0.22	0.38	1.1	1.6	0.34	2.1
Fluorene	ug/g	<0.050	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	0.1	0.18	<0.050	<0.10
Indeno(1,2,3-cd)pyrene	ug/g	0.21	0.0061	0.089	0.2	0.27	<0.050	0.66	0.31	<0.050	0.065	0.29	0.78	0.068	0.51
Methylnaphthalene, 2-(1-)	ug/g	<0.071	<0.0071	<0.071	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	0.056	<0.050	<0.10
1-Methylnaphthalene	ug/g	<0.050	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	0.056	<0.050	<0.10
2-Methylnaphthalene	ug/g	<0.050	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	0.055	0.076	<0.050	<0.10
Naphthalene	ug/g	<0.050	<0.0050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	0.081	<0.050	<0.10	<0.10
Phenanthrene	ug/g	0.21	0.015	0.13	0.39	0.66	<0.050	1.1	0.51	0.056	0.51	0.19	1.3	0.23	0.82
Pyrene	ug/g	0.57	0.024	0.25	0.65	0.85	<0.050	2	0.83	0.16	0.28	0.72	1.1	0.26	1.6
SIZE DISTRIBUTION															
< -1 Phi (2 mm)	%	82	98	73				93	80	60	71	87	99	47	
< 0 Phi (1 mm)	%	76	97	63				91	72	52	54	78	98	34	
< +1 Phi (0.5 mm)	%	74	97	50				89	66	40	32	66	97	24	
< +2 Phi (0.25 mm)	%	72	94	35				76	49	19	11	55	92	15	
< +3 Phi (0.12 mm)	%	67	90	27				60	27	10	6.2	51	83	9.2	
< +4 Phi (0.062 mm)	%	62	86	25				49	19	7.6	5	46	77	6.9	
< +5 Phi (0.031 mm)	%	54	78	23				38	15	6.3	4.1	37	67	5.5	
< +6 Phi (0.016 mm)	%	42	64	20				27	11	4.9	3.1	30	57	4.2	
< +7 Phi (0.0078 mm)	%	25	40	14				16	6.5	3	2	20	39	2.6	
< +8 Phi (0.0039 mm)	%	20	37	12				13	5.5	2.5	1.6	17	34	2.1	
< +9 Phi (0.0020 mm)	%	14	25	8				8.7	3.8	1.7	1.2	13	26	1.5	
Gravel	%	18	2.2	27				6.9	20	40	29	13	0.8	53	

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C12				CC-C13											
Sample ID	CC-C12WEST-15-30	CC-C12WEST-30-50	CC-C12CENTRE-0-15	CC-C12EAST-0-15	CC-C13WEST-0-15	CC-C13WEST-15-30	CC-C13WEST-30-45	CC-C13CENTRE-0-15	CC-C13CENTRE-15-30	CC-C13CENTRE-30-45	CC-C13EAST-0-15	CC-C13EAST-15-30	CC-C13EAST-30-50	CC-C14-WEST-0-15	CC-C14-WEST-15-30	
BV Labs Sample ID	PGU174	PGU175	PGU177	PGU176	PGU163	PGU164	PGU165	PGU166	PGU167	PGU168	PGU169	PGU170	PGU171	PIX228	PIX229	
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Soil	Soil	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/7/21 12:25	4/7/21 12:25	4/7/21 12:10	4/7/21 11:45	4/7/21 17:10	4/7/21 17:10	4/7/21 17:10	4/7/21 16:30	4/7/21 16:30	4/7/21 16:30	4/7/21 15:00	4/7/21 15:00	4/7/21 15:00	4/19/21 11:00	4/19/21 11:00	
Parameter Name	Units															
PHYSICAL																
Moisture	%	20	43	23	18	42	20	23	16	15	16	16	21	42	44	18
ANIONS & NUTRIENTS																
Total Ammonia-N	ug/g	37	98	38	74	207	87	72	<20	48	59	<20	36	141	91	<20
Nitrogen (N)	%	0.072	0.24	0.068	0.058	0.21	0.067	0.083	0.03	0.03	0.052	0.03	0.064	0.28	0.25	0.036
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	715	2380	677	578	2130	665	832	302	303	521	304	640	2780	2490	360
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																
Acid Extractable Aluminum (Al)	ug/g	11000	14000	7700	8900	9600	9700	12000	8600	8900	8400	7000	9800	13000	12000	9700
Acid Extractable Antimony (Sb)	ug/g	3.5	5.6	1	1.5	1.2	7.7	2.9	0.45	2.9	2.6	5.4	3.3	5.2	1.4	0.91
Acid Extractable Arsenic (As)	ug/g	5.8	6.6	5	7.4	5.1	6.3	7.9	4.5	5.7	4.6	4.6	7.1	8.4	5.1	4.3
Acid Extractable Barium (Ba)	ug/g	160	250	120	120	110	160	210	110	110	160	110	150	280	120	92
Acid Extractable Beryllium (Be)	ug/g	0.62	0.71	0.5	0.5	0.56	0.56	0.68	0.48	0.49	0.52	0.44	0.54	0.67	0.55	0.5
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	1.3	1.1	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	1.3	<1.0
Acid Extractable Boron (B)	ug/g	33	41	22	22	21	22	22	22	25	26	18	27	38	20	20
Acid Extractable Cadmium (Cd)	ug/g	18	37	1.7	3.6	0.82	4.3	22	0.58	4.9	10	0.42	19	44	0.97	0.65
Acid Extractable Calcium (Ca)	ug/g	53000	36000	63000	57000	59000	62000	57000	67000	68000	65000	60000	58000	50000	66000	72000
Acid Extractable Chromium (Cr)	ug/g	38	44	33	25	30	33	46	25	26	30	22	35	66	33	26
Acid Extractable Cobalt (Co)	ug/g	13	17	8.7	8.6	8.9	9.5	14	8.4	11	11	7	12	17	8.8	8.4
Acid Extractable Copper (Cu)	ug/g	120	100	46	95	85	100	200	52	93	98	49	87	150	99	63
Acid Extractable Iron (Fe)	ug/g	25000	24000	27000	26000	24000	26000	29000	25000	24000	23000	26000	24000	24000	25000	27000
Acid Extractable Lead (Pb)	ug/g	110	95	120	140	52	180	170	37	180	100	170	110	180	55	120
Acid Extractable Magnesium (Mg)	ug/g	16000	11000	22000	18000	24000	21000	17000	23000	20000	22000	20000	16000	13000	26000	24000
Acid Extractable Manganese (Mn)	ug/g	600	490	580	580	540	580	670	580	710	650	530	650	610	550	550
Acid Extractable Molybdenum (Mo)	ug/g	1	0.79	2.3	1.1	1.5	1.6	1.5	0.81	0.92	1	0.9	0.92	1.3	1.5	1.2
Acid Extractable Nickel (Ni)	ug/g	39	59	33	24	24	28	44	21	42	32	18	42	61	25	22
Acid Extractable Phosphorus (P)	ug/g	1300	1200	980	1100	1400	1400	1900	1100	980	1300	1100	1300	2200	1500	960
Acid Extractable Potassium (K)	ug/g	2200	2100	1700	1800	2000	2000	2200	1900	1600	1600	1600	1600	2000	2100	2000
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	0.61	0.56	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	0.68	<0.50
Acid Extractable Silver (Ag)	ug/g	3.1	3.1	5.9	3.8	1.1	2.7	6	<0.20	0.95	2.7	0.28	2.3	9.8	0.88	<0.20
Acid Extractable Sodium (Na)	ug/g	350	240	310	340	360	250	290	260	260	270	330	260	390	250	270
Acid Extractable Strontium (Sr)	ug/g	93	78	91	96	120	110	100	94	95	100	96	100	120	110	110
Acid Extractable Thallium (Tl)	ug/g	0.16	0.15	0.11	0.12	0.21	0.17	0.2	0.11	0.097	0.13	0.11	0.12	0.17	0.21	0.13
Acid Extractable Tin (Sn)	ug/g	24	20	5	26	6.6	19	26	4.1	8.5	12	22	30	33	8.5	32
Acid Extractable Uranium (U)	ug/g	0.72	0.78	0.54	0.54	0.7	0.74	0.74	0.58	0.56	0.75	0.55	0.97	0.75	0.78	0.69
Acid Extractable Vanadium (V)	ug/g	25	28	24	25	24	24	28	23	22	22	26	23	28	24	21
Acid Extractable Zinc (Zn)	ug/g	360	370	230	290	410	360	510	220	250	320	190	320	580	430	270
Acid Extractable Mercury (Hg)	ug/g	0.63	0.33	19	0.21	0.36	1.4	0.74	0.092	0.27	0.36	<0.050	0.45	1	0.26	0.059
PAHs																
Acenaphthene	ug/g	0.43	0.15	0.05	<0.050	<0.10	0.088	0.4	<0.050	0.076	0.067	0.0074	0.18	0.58	<0.10	<0.050
Acenaphthylene	ug/g	<0.050	<0.010	0.0079	<0.050	<0.10	<0.050	0.055	<0.050	0.091	<0.0050	<0.0050	<0.050	<0.10	<0.10	<0.050
Anthracene	ug/g	0.35	0.047	0.052	<0.050	<0.10	0.13	0.32	<0.050	0.091	0.092	0.017	0.24	0.45	0.25	0.058
Benzo(a)anthracene	ug/g	1.5	0.098	0.14	0.11	0.45	0.35	1.2	0.061	0.2	0.23	0.065	0.64	0.98	0.87	0.2
Benzo(a)pyrene	ug/g	1.2	0.084	0.13	0.17	0.54	0.38	0.99	0.056	0.18	0.22	0.063	0.48	0.89	1	0.19
Benzo(b,j)fluoranthene	ug/g	1.6	0.11	0.18	0.25	0.86	0.5	1.4	0.085	0.24	0.27	0.094	0.62	1.3	1.6	0.29
Benzo(g,h,i)perylene	ug/g	0.62	0.057	0.086	0.16	0.44	0.26	0.58	<0.050	0.12	0.13	0.045	0.25	0.53	0.95	0.15
Benzo(k)fluoranthene	ug/g	0.63	0.042	0.054	0.079	0.24	0.17	0.54	<0.050	0.077	0.099	0.026	0.23	0.38	0.55	0.099
Chrysene	ug/g	1.6	0.089	0.15	0.14	0.56	0.36	1.4	0.084	0.21	0.23	0.068	0.55	0.95	1	0.22
Dibenzo(a,h)anthracene	ug/g	0.18	0.015	0.022	<0.050	<0.10	0.062	0.16	<0.050	<0.050	0.034	0.01	0.076	0.14	0.2	<0.050
Fluoranthene	ug/g	4.8	0.32	0.48	0.45	1.6	1	4.1	0.28	0.62	0.68	0.25	1.9	3	3.3	0.67
Fluorene	ug/g	0.32	0.086	0.04	<0.050	<0.10	0.086	0.33	<0.050	0.072	0.063	0.0051	0.18	0.55	<0.10	<0.050
Indeno(1,2,3-cd)pyrene	ug/g	0.78	0.065	0.097	0.15	0.44	0.29	0.68	<0.050	0.13	0.15	0.049	0.3	0.61	0.96	0.16
Methylnaphthalene, 2-(1-)	ug/g	0.19	0.044	0.013	<0.071	<0.14	<0.071	0.48	<0.071	<0.071	0.049	<0.0071	<0.071	0.69	<0.14	<0.071
1-Methylnaphthalene	ug/g	0.088	0.013	0.0068	<0.050	<0.10	0.054	0.2	<0.050	<0.050	0.025	<0.0050	<0.050	0.32	<0.10	<0.050
2-Methylnaphthalene	ug/g	0.11	0.031	0.0064	<0.050	<0.10	<0.050	0.28	<0.050	<0.050	0.024	<0.0050	<0.050	0.36	<0.10	<0.050
Naphthalene	ug/g	0.089	0.032	0.0056	<0.050	<0.10	<0.050	0.35	<0.050	<0.050	0.014	<0.0050	<0.050	<0.10	<0.10	<0.050
Phenanthrene	ug/g	4.2	0.39	0.23	0.14	0.62	0.63	3.8	0.14	0.42	0.41	0.065	1.4	2.5	1.4	0.24
Pyrene	ug/g	3.5	0.24	0.35	0.34	1.2	0.78	2.9	0.21	0.47	0.49	0.18	1.4	2.2	2.4	0.46
SIZE DISTRIBUTION																
< -1 Phi (2 mm)	%					85	64	74	77	65	65	64	84	99		
< 0 Phi (1 mm)	%					75	44	54	64	51	47	53	69	99		
< +1 Phi (0.5 mm)	%					66	29	44	48	37	33	37	54	98		
< +2 Phi (0.25 mm)	%					60	22	39	27	21	23	18	41	97		
< +3 Phi (0.12 mm)	%					57	18	38	17	17	16	10	36	96		
< +4 Phi (0.062 mm)	%					53	15	37	14	12	12	7.9	31	89		
< +5 Phi (0.031 mm)	%					45	13	34	13	10	10	7	27	80		
< +6 Phi (0.016 mm)	%					35	9.5	30	11	7.8	7.9	5.6	22	63		
< +7 Phi (0.0078 mm)	%					22	5.9	21	8	4.9	5.1	3.9	15	41		
< +8 Phi (0.0039 mm)	%					18										

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C16										CC-C03				
	Sample ID	CC-C15-EAST-30-45	CC-C15-EAST-45-60	CC-C16-WEST-0-15	CC-C16-WEST-15-30	CC-C16-CENTRE-0-15	CC-C16-CENTRE-15-30	CC-C16-CENTRE-30-45	CC-C16-CENTRE-45-60	CC-C16-EAST-0-15	CC-C16-EAST-15-30	CC-C03-WEST-0-15	CC-C03-WEST-15-30	CC-C03-WEST-30-45	CC-C03-CENTRE-0-15
BV Labs Sample ID	PHJ598	PHJ599	PHJ611	PHJ612	PHJ607	PHJ608	PHJ609	PHJ610	PHJ605	PHJ606	PHY922	PHY923	PHY924	PHY919	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/9/21 14:00	4/9/21 14:00	4/12/21 14:30	4/12/21 14:30	4/12/21 13:30	4/12/21 13:30	4/12/21 13:30	4/12/21 13:30	4/12/21 15:30	4/12/21 15:30	4/13/21 11:30	4/13/21 11:30	4/13/21 11:30	4/13/21 10:30	
Parameter Name	Units														
PHYSICAL															
Moisture	%	36	62	50	37	26	23	29	32	28	24	56	27	25	21
ANIONS & NUTRIENTS															
Total Ammonia-N	ug/g	56	<20	37	<20	34	39	88	89	<20	34	425	85	69	<20
Nitrogen (N)	%														
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1730	7260	3060	1410	631	349	778	1300	961	558	3800	753	613	388
Nitrite (N)	ug/g														
Nitrate (N)	ug/g														
Nitrate + Nitrite (N)	ug/g														
METALS															
Acid Extractable Aluminum (Al)	ug/g	10000	10000	10000	9700	8400	8900	10000	13000	8100	11000	12000	7200	8200	7800
Acid Extractable Antimony (Sb)	ug/g	1.9	2.8	1.3	1.9	0.58	0.62	4.1	4.6	0.85	3.6	1.4	0.83	1.5	0.56
Acid Extractable Arsenic (As)	ug/g	4.7	6.3	5.2	5.4	3.3	4.5	6.3	8	4.2	7.6	5.4	4.2	3.6	3.1
Acid Extractable Barium (Ba)	ug/g	120	180	120	91	89	100	94	230	94	170	120	83	76	89
Acid Extractable Beryllium (Be)	ug/g	0.54	0.51	0.55	0.53	0.48	0.52	0.57	0.64	0.44	0.56	0.61	0.41	0.42	0.44
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	1.4	1.4	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	2.2	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	17	26	20	17	19	22	19	39	19	26	20	13	9.7	17
Acid Extractable Cadmium (Cd)	ug/g	9.6	6.1	0.81	0.93	0.45	0.89	11	32	0.65	20	0.87	1.4	8.3	0.34
Acid Extractable Calcium (Ca)	ug/g	49000	47000	65000	70000	69000	74000	65000	59000	69000	64000	64000	65000	63000	70000
Acid Extractable Chromium (Cr)	ug/g	24	24	33	31	23	25	30	53	25	40	35	27	20	22
Acid Extractable Cobalt (Co)	ug/g	9.6	9.4	9.1	8.8	7.4	8.7	13	16	7.3	13	9.5	7.2	8.3	6.6
Acid Extractable Copper (Cu)	ug/g	55	100	100	75	47	46	89	140	55	140	130	87	46	49
Acid Extractable Iron (Fe)	ug/g	22000	22000	24000	23000	22000	26000	24000	26000	22000	28000	25000	22000	19000	21000
Acid Extractable Lead (Pb)	ug/g	68	170	41	120	50	110	110	180	43	120	49	76	42	80
Acid Extractable Magnesium (Mg)	ug/g	8800	13000	24000	23000	23000	26000	18000	15000	21000	17000	24000	19000	10000	23000
Acid Extractable Manganese (Mn)	ug/g	590	420	520	500	510	590	740	700	500	650	530	470	570	490
Acid Extractable Molybdenum (Mo)	ug/g	0.7	1.3	1.8	1.3	1	0.92	1.2	0.96	4.4	2.2	1.5	0.52	0.96	
Acid Extractable Nickel (Ni)	ug/g	29	36	25	23	20	22	35	50	18	43	26	19	22	18
Acid Extractable Phosphorus (P)	ug/g	1100	910	1400	910	820	1000	1200	1900	1000	1200	1700	850	870	830
Acid Extractable Potassium (K)	ug/g	1600	1600	1900	1700	1900	1900	1900	2200	1700	2100	2000	1300	1400	1700
Acid Extractable Selenium (Se)	ug/g	<0.50	0.56	0.65	0.51	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	0.76	<0.50	<0.50	<0.50
Acid Extractable Silver (Ag)	ug/g	1.1	1.1	0.7	0.47	0.23	0.65	2.8	6.5	0.29	2.5	0.99	0.33	0.92	<0.20
Acid Extractable Sodium (Na)	ug/g	300	510	510	410	320	380	560	740	370	510	560	150	140	250
Acid Extractable Strontium (Sr)	ug/g	94	94	120	120	110	120	110	120	120	120	130	100	110	100
Acid Extractable Thallium (Tl)	ug/g	0.12	0.14	0.2	0.19	0.12	0.12	0.13	0.18	0.14	0.17	0.27	0.16	0.11	0.13
Acid Extractable Tin (Sn)	ug/g	12	21	5	4.3	3	9	12	26	11	110	4.9	5.5	5.8	5.7
Acid Extractable Uranium (U)	ug/g	0.57	0.7	0.77	0.76	0.64	0.66	0.66	0.66	0.6	0.67	0.83	0.59	0.5	0.58
Acid Extractable Vanadium (V)	ug/g	25	22	25	25	19	23	24	29	22	27	27	23	21	21
Acid Extractable Zinc (Zn)	ug/g	230	320	430	360	200	250	270	540	260	470	520	280	170	180
Acid Extractable Mercury (Hg)	ug/g	0.17	0.23	0.18	0.5	0.064	3.8	0.34	0.66	0.1	0.33	0.22	0.082	0.085	<0.050
PAHs															
Acenaphthene	ug/g	0.49	0.46	<0.10	0.051	0.074	<0.050	0.16	0.25	0.09	0.023	<0.10	<0.050	<0.050	<0.050
Acenaphthylene	ug/g	<0.050	<0.15	<0.10	<0.050	<0.050	<0.050	<0.20	<0.20	<0.050	0.0057	<0.10	<0.050	<0.050	<0.050
Anthracene	ug/g	0.26	0.69	0.14	0.1	0.13	<0.050	0.2	0.37	0.18	0.037	0.17	<0.050	<0.050	0.092
Benzo(a)anthracene	ug/g	0.48	0.93	0.81	0.62	0.25	0.12	0.52	0.94	0.44	0.09	0.7	0.23	0.16	0.29
Benzo(a)pyrene	ug/g	0.38	0.78	1	0.75	0.2	0.12	0.51	0.89	0.43	0.087	0.86	0.26	0.15	0.25
Benzo(b)fluoranthene	ug/g	0.55	1.1	1.8	1.3	0.32	0.19	0.78	1.4	0.68	0.14	1.6	0.46	0.23	0.37
Benzo(g,h,i)perylene	ug/g	0.23	0.38	0.98	0.69	0.11	0.09	0.37	0.66	0.33	0.071	0.84	0.24	0.12	0.17
Benzo(k)fluoranthene	ug/g	0.21	0.39	0.61	0.44	0.11	0.065	0.28	0.48	0.24	0.046	0.52	0.16	0.091	0.12
Chrysene	ug/g	0.42	0.87	1.1	0.67	0.27	0.15	0.5	0.95	0.42	0.097	0.98	0.26	0.12	0.3
Dibenzo(a,h)anthracene	ug/g	0.053	<0.15	0.15	0.12	<0.050	<0.050	0.084	0.16	0.064	0.019	0.14	<0.050	<0.050	<0.050
Fluoranthene	ug/g	1.5	3.2	3	2.1	1.1	0.53	1.5	2.9	1.5	0.31	2.7	0.86	0.49	0.95
Fluorene	ug/g	0.29	0.36	<0.10	<0.050	0.085	<0.050	0.19	0.37	0.079	0.017	<0.10	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	ug/g	0.25	0.43	0.91	0.66	0.12	0.082	0.38	0.7	0.32	0.07	0.77	0.23	0.13	0.19
Methylnaphthalene, 2-(1-)	ug/g											<0.14	<0.071	<0.071	<0.071
1-Methylnaphthalene	ug/g	0.061	<0.15	<0.10	<0.050	<0.050	<0.050	0.18	0.36	<0.050	0.0056	<0.10	<0.050	<0.050	<0.050
2-Methylnaphthalene	ug/g	<0.050	<0.15	<0.10	<0.050	<0.050	<0.050	0.18	0.45	<0.050	0.0058	0.1	<0.050	<0.050	<0.050
Naphthalene	ug/g	<0.050	<0.15	<0.10	<0.10	0.086	<0.050	<0.10	<0.20	<0.050	<0.0050	<0.10	<0.050	<0.050	<0.050
Phenanthrene	ug/g	1.3	2.9	1.1	0.56	0.9	0.22	1	2	0.66	0.11	1	0.25	0.075	0.47
Pyrene	ug/g	0.96	2.4	2.1	1.5	0.75	0.38	0.97	1.9	1	0.22	1.8	0.6	0.37	0.7
SIZE DISTRIBUTION															
< -1 Phi (2 mm)	%	91	98			92	83	94	97			99	91	97	95
< 0 Phi (1 mm)	%	89	95			82	66	84	89			98	79	94	85
< +1 Phi (0.5 mm)	%	87	91			63	42	71	77			97	62	88	60
< +2 Phi (0.25 mm)	%	82	87			39	21	63	70			95	36	79	32
< +3 Phi (0.12 mm)	%	70	83			22	13	60	68			93	25	65	21
< +4 Phi (0.062 mm)	%	59	76			15	9.3	49	64			86	21	47	17
< +5 Phi (0.031 mm)	%	51	66			12	7.6	38	53			77	19	35	14
< +6 Phi (0.016 mm)	%	40	56			9.9	6.1	29	42			58	14	24	12
< +7 Phi (0.0078 mm)	%	27	39			6.6	3.8	18	26			31	8.3	14	7.9
< +8 Phi (0.0039 mm)	%	22	32			5.6	3.1	16	22			23	6.2	12	6.6
< +9 Phi (0.0020 mm)	%	16	23			3.9	2.1	11	15			9.1	1.8	8.5	4.7
Gravel	%	8.8	2.4			7.5	17	6.3	3.1			0.76	8.7	2.6	5.2
Coarse Sand	%	14	12			60	65	32	28			5.2	60	24	67
Fine Sand	%	18	9.8			17	8.5	13	5.2			7.6	10	26	11
Silt	%	37	43			9.3	6.2	33	42			63	15	35	10
Clay	%	22	32			5.6	3.1	16	22			23	6.2	12	6.6
Loss on Ignition	%w/w	6.1	32.2			2.9	1.6	3.3							

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C17														
Sample ID	CC-C03-CENTRE-15-30	CC-C03-CENTRE-30-45	CC-C03-EAST-0-15	CC-C17-WEST-0-15	CC-C17-WEST-15-30	CC-C17-WEST-30-45	CC-C17-WEST-45-60	CC-C17-CENTRE-0-15	CC-C17-CENTRE-15-30	CC-C17-CENTRE-30-45	CC-C17-EAST-0-15	CC-C18-WEST-0-15	CC-C18-WEST-15-30	CC-C18-WEST-30-45	
BV Labs Sample ID	PHY920	PHY921	PHY918	PHY929	PHY930	PHY931	PHY932	PHY926	PHY927	PHY928	PHY925	PHY937	PHY938	PHY939	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/13/21 10:30	4/13/21 10:30	4/13/21 9:30	4/13/21 14:00	4/13/21 14:00	4/13/21 14:00	4/13/21 14:00	4/13/21 13:30	4/13/21 13:30	4/13/21 13:30	4/13/21 13:00	4/14/21 10:00	4/14/21 10:00	4/14/21 10:00	
Parameter Name	Units														
PHYSICAL															
Moisture	%	21	17	24	42	23	33	33	23	23	26	37	34	33	35
ANIONS & NUTRIENTS															
Total Ammonia-N	ug/g	40	<20	<20	145	171	216	135	46	86	84	<20	284	211	175
Nitrogen (N)	%														
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	422	309	657	1810	573	1280	1340	594	746	823	1250	1660	1040	1590
Nitrite (N)	ug/g														
Nitrate (N)	ug/g														
Nitrate + Nitrite (N)	ug/g														
METALS															
Acid Extractable Aluminum (Al)	ug/g	7800	6300	5600	8900	7800	11000	10000	8400	9400	7000	8200	8600	9900	12000
Acid Extractable Antimony (Sb)	ug/g	0.94	0.73	0.37	0.98	1.1	3.5	3.2	0.78	1.9	1.6	0.8	1.2	1.9	2.7
Acid Extractable Arsenic (As)	ug/g	4.6	3.3	2.6	4.2	3.9	7	7	3.9	5.7	4.1	4.8	4.3	6.5	7.1
Acid Extractable Barium (Ba)	ug/g	95	50	49	100	73	130	190	100	110	95	67	94	110	180
Acid Extractable Beryllium (Be)	ug/g	0.45	0.33	0.32	0.51	0.46	0.58	0.49	0.46	0.52	0.4	0.44	0.49	0.56	0.64
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.1
Acid Extractable Boron (B)	ug/g	13	6	8.8	20	17	29	22	18	13	14	14	18	23	25
Acid Extractable Cadmium (Cd)	ug/g	3.4	4.9	0.29	0.71	1.5	10	23	1.1	8.3	10	0.59	0.71	7.6	21
Acid Extractable Calcium (Ca)	ug/g	69000	60000	63000	63000	64000	64000	59000	68000	65000	54000	70000	67000	67000	58000
Acid Extractable Chromium (Cr)	ug/g	23	14	13	27	23	27	39	24	29	23	21	24	29	42
Acid Extractable Cobalt (Co)	ug/g	8.3	6.9	5.4	8	8.4	12	13	7.8	10	8.4	7.2	7.6	10	14
Acid Extractable Copper (Cu)	ug/g	52	31	32	89	46	88	120	74	70	60	51	76	61	110
Acid Extractable Iron (Fe)	ug/g	22000	16000	16000	23000	21000	24000	22000	22000	22000	17000	21000	21000	23000	24000
Acid Extractable Lead (Pb)	ug/g	92	23	24	42	50	85	120	27	68	59	38	41	83	120
Acid Extractable Magnesium (Mg)	ug/g	16000	7400	12000	22000	19000	19000	13000	23000	16000	8900	17000	22000	20000	12000
Acid Extractable Manganese (Mn)	ug/g	540	490	440	530	550	790	610	510	720	570	470	490	640	680
Acid Extractable Molybdenum (Mo)	ug/g	0.7	<0.50	0.67	1.2	0.72	0.89	1	0.85	0.78	0.6	1.1	1.3	0.96	1.1
Acid Extractable Nickel (Ni)	ug/g	22	16	12	21	20	36	41	20	31	24	18	20	27	42
Acid Extractable Phosphorus (P)	ug/g	1000	810	880	1200	830	1000	1600	890	1100	990	840	1200	1100	1600
Acid Extractable Potassium (K)	ug/g	1400	1000	1000	1800	1400	1900	1500	1700	1600	1100	1500	1600	1800	1900
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Silver (Ag)	ug/g	0.63	0.5	<0.20	0.56	0.75	2.2	5.1	0.41	2.5	2	0.27	0.78	1.2	5.3
Acid Extractable Sodium (Na)	ug/g	250	150	200	370	200	280	250	260	270	210	310	330	240	240
Acid Extractable Strontium (Sr)	ug/g	120	110	120	120	96	100	110	110	120	110	160	120	110	110
Acid Extractable Thallium (Tl)	ug/g	0.1	0.077	0.099	0.17	0.12	0.12	0.13	0.14	0.12	0.1	0.14	0.15	0.16	0.16
Acid Extractable Tin (Sn)	ug/g	11	3.5	4.1	12	7.3	10	20	4.8	9.1	8.2	2.7	4	7.1	18
Acid Extractable Uranium (U)	ug/g	0.55	0.44	0.42	0.65	0.51	0.63	0.56	0.62	0.58	0.44	0.62	0.66	0.57	0.65
Acid Extractable Vanadium (V)	ug/g	21	19	18	23	19	24	23	20	23	19	21	22	23	27
Acid Extractable Zinc (Zn)	ug/g	200	85	130	300	190	260	400	230	230	200	250	300	320	360
Acid Extractable Mercury (Hg)	ug/g	0.11	0.053	<0.050	0.12	0.12	0.36	0.6	0.093	0.32	0.23	0.12	0.46	0.25	0.62
PAHs															
Acenaphthene	ug/g	<0.050	0.0076	0.028	0.12	0.073	0.21	0.34	0.081	0.13	0.13	<0.10	<0.050	0.11	0.31
Acenaphthylene	ug/g	<0.050	0.009	0.0052	<0.020	<0.050	<0.050	<0.050	<0.050	<0.050	0.025	<0.10	<0.050	<0.050	<0.050
Anthracene	ug/g	<0.050	0.036	0.088	0.32	0.12	0.3	0.43	0.37	0.14	0.21	0.11	0.078	0.19	0.43
Benzo(a)anthracene	ug/g	0.11	0.15	0.25	0.92	0.32	0.73	1.1	1.8	0.49	0.5	0.34	0.32	0.65	1
Benzo(a)pyrene	ug/g	0.1	0.15	0.28	0.89	0.28	0.65	0.97	1.1	0.42	0.45	0.39	0.38	0.69	0.9
Benzo(b,j)fluoranthene	ug/g	0.16	0.22	0.47	1.5	0.38	0.9	1.3	1.8	0.58	0.73	0.64	0.62	1.1	1.3
Benzo(g,h,i)perylene	ug/g	0.08	0.12	0.24	0.66	0.19	0.4	0.58	0.51	0.26	0.31	0.36	0.32	0.59	0.53
Benzo(k)fluoranthene	ug/g	<0.050	0.079	0.15	0.52	0.14	0.27	0.48	0.23	0.23	0.26	0.18	0.17	0.41	0.39
Chrysene	ug/g	0.12	0.12	0.29	0.93	0.33	0.65	1	1.5	0.54	0.48	0.42	0.42	0.7	0.93
Dibenzo(a,h)anthracene	ug/g	<0.050	0.027	0.045	0.15	<0.050	0.099	0.15	0.15	0.062	0.091	<0.10	<0.050	0.13	0.13
Fluoranthene	ug/g	0.39	0.45	0.91	2.8	0.97	2	3.2	4.5	1.6	1.5	1.3	1.3	2	2.9
Fluorene	ug/g	<0.050	0.0069	0.031	0.15	0.076	0.25	0.48	0.066	0.14	0.19	<0.10	0.058	0.16	0.44
Indeno(1,2,3-cd)pyrene	ug/g	0.082	0.12	0.23	0.65	0.2	0.45	0.67	0.56	0.34	0.34	0.36	0.32	0.6	0.61
Methylnaphthalene, 2-(1-)	ug/g	<0.071	<0.0071	0.017	0.095	<0.071	0.27	0.63	<0.071	0.19	0.34	<0.14	<0.071	0.17	0.59
1-Methylnaphthalene	ug/g	<0.050	<0.0050	<0.0050	0.021	<0.050	0.12	0.26	<0.050	0.089	0.15	<0.10	<0.050	0.079	0.24
2-Methylnaphthalene	ug/g	<0.050	0.0054	0.017	0.074	<0.050	0.15	0.37	<0.050	0.098	0.18	<0.10	<0.050	0.089	0.36
Naphthalene	ug/g	<0.050	0.0056	0.0064	0.037	<0.050	<0.050	<0.050	<0.050	0.052	<0.050	<0.10	<0.050	<0.050	0.054
Phenanthrene	ug/g	0.11	0.072	0.33	1.3	0.57	1.5	2.5	1.5	1.3	1	0.39	0.55	0.99	2.3
Pyrene	ug/g	0.29	0.33	0.61	1.9	0.71	1.5	2.4	3.2	1.1	1	0.96	0.93	1.3	2.2
SIZE DISTRIBUTION															
< -1 Phi (2 mm)	%	83	98	100	97	95	99		98		99	92			
< 0 Phi (1 mm)	%	70	96	100	94	88	98		91		88	92			
< +1 Phi (0.5 mm)	%	49	94	98	87	76	97		76		75	91			
< +2 Phi (0.25 mm)	%	25	87	77	68	34	95		50		63	88			
< +3 Phi (0.12 mm)	%	18	68	45	59	20	93		27		52	68			
< +4 Phi (0.062 mm)	%	15	42	26	52	15	76		20		39	49			
< +5 Phi (0.031 mm)	%	12	25	17	40	11	58		18		28	36			
< +6 Phi (0.016 mm)	%	9.6	17	13	33	8.9	44		15		21	28			
< +7 Phi (0.0078 mm)	%	6.3	9.9	8.2	20	5.6	27		10		13	18			
< +8 Phi (0.0039 mm)	%	5.3	8.2	7	17	4.7	23		7.7		11	15			
< +9 Phi (0.0020 mm)	%	3.8	6.1	5.2	9.2	3.2	16		2.7		8	11			
Gravel	%	17	2.4	<0.10	3.4	5.2	1.1		2.2		4.4	7.6			
Coarse Sand	%	61	18	36	33	66	4.4		57		37	19			
Fine Sand	%	8.1	37	38	12	13	19		21		19	31			
Silt	%	9.2	34	19	35	10	53		13		28	34			
Clay	%	5.3	8.2	7	17	4.7	23		7.7		11	15			
Loss on Ignition	%w/w	2	1.4	2.3	5.5	2.1	4		2.4		2.8	2.6			
Wet Bulk Density	g/cm³	2	2	1.9	1.6	1.9	1.7		1.8	</					

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C04														
Sample ID	CC-C19-EAST-0-15	CC-C04-WEST-0-15	CC-C04-WEST-15-30	CC-C04-WEST-30-45	CC-C04-WEST-45-60	CC-C04-CENTRE-0-15	CC-C04-CENTRE-15-30	CC-C04-CENTRE-30-45	CC-C04-CENTRE-45-60	CC-C04-EAST-0-15	CC-C04-EAST-15-30	CC-C20-WEST-0-15	CC-C20-WEST-15-30	CC-C20-WEST-30-45	
BV Labs Sample ID	PHY941	PIX237	PIX238	PIX239	PIX240	PIX233	PIX234	PIX235	PIX236	PIX231	PIX232	PHY954	PHY953	PHY955	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil	Soil	Soil	Soil	Soil	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/14/21 11:00	4/19/21 13:00	4/19/21 13:00	4/19/21 13:00	4/19/21 13:00	4/19/21 12:30	4/19/21 12:30	4/19/21 12:30	4/19/21 12:30	4/19/21 12:00	4/19/21 12:00	4/14/21 15:00	4/14/21 15:00	4/14/21 15:00	
Parameter Name	Units														
PHYSICAL															
Moisture	%	40	37	34	34	32	20	32	34		55	25	57	57	32
ANIONS & NUTRIENTS															
Total Ammonia-N	ug/g	<20	152	179	181	140	43	133	155	29	<20	341	463	218	
Nitrogen (N)	%		0.17	0.18	0.14	0.11	0.056	0.13	0.12	0.26	0.055				
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1900	1720	1810	1360	1130	560	1300	1170	2590	554	3800	3800	1290	
Nitrite (N)	ug/g		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5				
Nitrate (N)	ug/g		<2	<2	<2	<2	<2	<2	<2	<2	<2				
Nitrate + Nitrite (N)	ug/g		<3	<3	<3	<3	<3	<3	<3	<3	<3				
METALS															
Acid Extractable Aluminum (Al)	ug/g	9200	9800	9300	11000	11000	7600	12000	12000	11000	5500	11000	10000	9500	
Acid Extractable Antimony (Sb)	ug/g	0.97	1.6	2.1	2.1	1.8	0.56	2	2	1.3	0.42	1.3	1.8	1.3	
Acid Extractable Arsenic (As)	ug/g	4.7	5.7	5.5	6.5	5.7	4.1	7.3	6.2	5.9	2.9	5	5.1	5.2	
Acid Extractable Barium (Ba)	ug/g	86	160	190	220	120	89	240	150	100	46	120	150	110	
Acid Extractable Beryllium (Be)	ug/g	0.5	0.44	0.44	0.51	0.5	0.41	0.56	0.6	0.51	0.25	0.56	0.58	0.48	
Acid Extractable Bismuth (Bi)	ug/g	<1.0	3	1.5	<1.0	<1.0	<1.0	1.2	<1.0	1.1	<1.0	1.3	1.5	<1.0	
Acid Extractable Boron (B)	ug/g	18	22	25	22	23	17	27	25	16	7	21	22	18	
Acid Extractable Cadmium (Cd)	ug/g	0.65	14	26	30	7.9	3.2	30	14	0.81	0.28	1.1	7.7	2.6	
Acid Extractable Calcium (Ca)	ug/g	66000	63000	57000	58000	61000	66000	66000	62000	66000	70000	64000	58000	78000	
Acid Extractable Chromium (Cr)	ug/g	25	40	51	56	30	23	57	37	29	12	31	39	26	
Acid Extractable Cobalt (Co)	ug/g	8.2	11	13	14	11	7.1	15	12	8.5	4.5	8.9	11	8.6	
Acid Extractable Copper (Cu)	ug/g	67	150	150	130	76	46	120	83	83	29	93	130	67	
Acid Extractable Iron (Fe)	ug/g	22000	23000	19000	23000	22000	20000	25000	24000	25000	15000	25000	24000	24000	
Acid Extractable Lead (Pb)	ug/g	33	110	98	110	72	40	140	85	39	15	43	88	100	
Acid Extractable Magnesium (Mg)	ug/g	22000	20000	16000	15000	15000	20000	19000	16000	22000	11000	23000	20000	22000	
Acid Extractable Manganese (Mn)	ug/g	510	510	500	590	710	490	630	720	520	410	520	540	620	
Acid Extractable Molybdenum (Mo)	ug/g	1.3	1.2	0.83	1	0.75	0.63	1.2	0.88	1.6	0.65	1.7	1.6	1.2	
Acid Extractable Nickel (Ni)	ug/g	20	41	53	56	32	20	53	40	23	11	26	34	26	
Acid Extractable Phosphorus (P)	ug/g	1000	1300	1400	1500	1100	1700	1200	1100	1100	800	1300	1500	1100	
Acid Extractable Potassium (K)	ug/g	1800	1600	1400	1500	1600	1500	1900	1900	1900	850	2100	1700	1600	
Acid Extractable Selenium (Se)	ug/g	<0.50	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	0.62	0.56	<0.50	
Acid Extractable Silver (Ag)	ug/g	0.3	7.8	11	5.3	5	0.85	5.7	0.47	3.1	<0.20	0.74	2.7	0.95	
Acid Extractable Sodium (Na)	ug/g	370	440	320	310	260	270	510	450	250	120	540	420	230	
Acid Extractable Strontium (Sr)	ug/g	140	130	96	110	98	99	120	110	160	130	140	140	170	
Acid Extractable Thallium (Tl)	ug/g	0.17	0.16	0.11	0.12	0.12	0.1	0.14	0.13	0.19	0.073	0.19	0.2	0.15	
Acid Extractable Tin (Sn)	ug/g	2.9	9.2	16	23	7.8	3.1	24	11	4.3	1.2	6.4	9.9	8.1	
Acid Extractable Uranium (U)	ug/g	0.68	0.63	0.59	0.61	0.57	0.44	0.65	0.62	0.76	0.45	0.75	0.74	0.62	
Acid Extractable Vanadium (V)	ug/g	23	23	19	22	22	19	25	24	24	16	24	25	23	
Acid Extractable Zinc (Zn)	ug/g	320	440	420	440	260	210	520	300	420	120	400	480	340	
Acid Extractable Mercury (Hg)	ug/g	0.13	3.8	0.47	0.42	0.29	0.14	0.45	0.3	0.12	0.051	0.12	0.3	0.18	
PAHs															
Acenaphthene	ug/g	0.052	0.11	0.39	0.48	0.31	0.1	0.38	0.31	<0.10	0.018	0.11	<0.10	<0.050	
Acenaphthylene	ug/g	0.015	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	0.0061	<0.10	<0.10	<0.050	
Anthracene	ug/g	0.18	0.15	0.5	0.39	0.37	0.2	0.47	0.29	0.16	0.034	0.25	0.16	0.078	
Benzo(a)anthracene	ug/g	0.66	0.48	0.95	0.82	0.75	0.5	1.1	0.58	0.64	0.16	1	0.83	0.33	
Benzo(a)pyrene	ug/g	0.76	0.54	0.86	0.82	0.71	0.47	1	0.58	0.85	0.22	1.1	0.97	0.36	
Benzo(b)fluoranthene	ug/g	1.3	0.89	1.2	1.2	1	0.71	1.6	0.86	1.5	0.39	1.9	1.8	0.65	
Benzo(g,h,i)perylene	ug/g	0.66	0.52	0.62	0.67	0.51	0.34	0.84	0.49	0.92	0.26	0.99	0.94	0.33	
Benzo(k)fluoranthene	ug/g	0.45	0.3	0.45	0.39	0.36	0.24	0.55	0.44	0.44	0.12	0.67	0.55	0.22	
Chrysene	ug/g	0.76	0.59	0.95	0.93	0.76	0.48	1.2	0.65	0.96	0.26	1.2	1	0.44	
Dibenzo(a,h)anthracene	ug/g	0.12	0.12	0.18	0.16	0.16	0.079	0.2	0.14	0.15	0.05	0.17	0.15	0.057	
Fluoranthene	ug/g	2.4	1.8	3	2.5	2.4	1.8	3.8	2.8	2.8	0.66	3.4	3	1.1	
Fluorene	ug/g	0.075	0.15	0.53	0.52	0.3	0.13	0.51	0.33	<0.10	0.016	0.14	<0.10	0.062	
Indeno(1,2,3-cd)pyrene	ug/g	0.63	0.54	0.64	0.68	0.57	0.38	0.84	0.5	0.84	0.24	0.92	0.87	0.32	
Methylnaphthalene, 2-(1-)	ug/g	0.062	<0.11	0.62	1.4	0.8	0.12	1.6	1.1	<0.14	0.015	<0.14	<0.14	<0.071	
1-Methylnaphthalene	ug/g	0.011	0.1	0.48	0.82	0.36	0.058	0.72	0.48	<0.10	<0.0050	<0.10	<0.10	<0.050	
2-Methylnaphthalene	ug/g	0.052	<0.10	0.13	0.56	0.44	0.058	0.92	0.63	<0.10	0.015	0.12	0.11	<0.050	
Naphthalene	ug/g	0.03	<0.050	0.097	<0.20	<0.10	<0.050	<0.20	<0.20	<0.10	<0.0050	<0.10	<0.10	<0.050	
Phenanthrene	ug/g	0.79	0.82	2.9	2.8	3.3	2.1	1.1	3.3	0.82	0.15	1.5	1.1	0.33	
Pyrene	ug/g	1.6	1.4	2.3	1.9	1.8	1.3	2.8	1.3	2	0.49	2.3	2.1	0.77	
SIZE DISTRIBUTION															
< -1 Phi (2 mm)	%	99					94	90	100						
< 0 Phi (1 mm)	%	99					89	83	99						
< +1 Phi (0.5 mm)	%	98					79	70	99						
< +2 Phi (0.25 mm)	%	92					55	61	98						
< +3 Phi (0.12 mm)	%	85					26	55	97						
< +4 Phi (0.062 mm)	%	76					17	50	84						
< +5 Phi (0.031 mm)	%	61					13	42	67						
< +6 Phi (0.016 mm)	%	45					10	35	51						
< +7 Phi (0.0078 mm)	%	22					6.6	23	32						
< +8 Phi (0.0039 mm)	%	10					5.4	20	27						
< +9 Phi (0.0020 mm)	%	3.2					3.9	14	19						
Gravel	%	0.65					6.1	9.6	0.32						
Coarse Sand	%	10					50	32	2.1						
Fine Sand	%	13					27	8.7	14						
Silt	%	66					12	29	57						
Clay	%	10					5.4	20	27						
Loss on Ignition	%w/w	6.7					2	4.3	4						
Wet Bulk Density	g/cm³	1.5					2	1.8	1.7						
Liquid Limit	%w/w	48	51	COMMENT	36	COMMENT	45	26	69	COMMENT					
Plastic Limit	%w/w	28	29	COMMENT	23	COMMENT	25	24	35	COMMENT					
Plasticity Index	%w/w	20	22	COMMENT	19	COMMENT	20	12	24	COMMENT					
Dissolved BOD5	mg/L						<8		<10						

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C20					CC-C21									
	Sample ID	CC-C20-WEST-45-60	CC-C20-CENTRE-0-15	CC-C20-CENTRE-15-30	CC-C20-CENTRE-30-45	CC-C20-EAST-0-15	CC-C21-WEST-0-15	CC-C21-WEST-15-30	CC-C21-WEST-30-45	CC-C21-CENTRE-0-15	CC-C21-CENTRE-15-30	CC-C21-EAST-0-15	CC-C21-EAST-15-30	CC-C22-WEST-0-15	CC-C22-WEST-15-30
BV Labs Sample ID	PHY956	PHY950	PHY951	PHY952	PHY949	PIH405	PIH406	PIH407	PIH403	PIH404	PIH401	PIH402	PIH412	PIH413	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/14/21 15:00	4/14/21 14:30	4/14/21 14:30	4/14/21 14:30	4/14/21 14:00	4/15/21 10:00	4/15/21 10:00	4/15/21 10:00	4/15/21 9:30	4/15/21 9:30	4/15/21 9:00	4/15/21 9:00	4/15/21 12:00	4/15/21 12:00	
Parameter Name	Units														
PHYSICAL															
Moisture	%	35	36	38	39	50	57	36	28	30	38	51	59	53	20
ANIONS & NUTRIENTS															
Total Ammonia-N	ug/g	214	150	174	137	<20	61	<20	<20	<20	<20	126	474	317	90
Nitrogen (N)	%														
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1650	1390	1750	1630	2160	3240	1230	671	1010	1490	2580	5500	3240	367
Nitrite (N)	ug/g														
Nitrate (N)	ug/g														
Nitrate + Nitrite (N)	ug/g														
METALS															
Acid Extractable Aluminum (Al)	ug/g	11000	14000	9300	11000	10000	12000	10000	8600	7400	11000	11000	12000	11000	6900
Acid Extractable Antimony (Sb)	ug/g	2	2	1.8	2.2	0.79	1.6	1.7	1.9	1.1	2	1.5	0.56	1.6	1
Acid Extractable Arsenic (As)	ug/g	6.4	7.6	5.1	6.3	5.7	5.8	6.4	6.6	4.1	6.5	5.5	5.1	5.5	3.5
Acid Extractable Barium (Ba)	ug/g	270	200	200	250	100	120	110	92	100	180	120	110	130	86
Acid Extractable Beryllium (Be)	ug/g	0.55	0.65	0.43	0.54	0.49	0.59	0.5	0.52	0.38	0.57	0.55	0.54	0.55	0.36
Acid Extractable Bismuth (Bi)	ug/g	1.2	1.2	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.7	<1.0
Acid Extractable Boron (B)	ug/g	27	25	21	25	20	19	13	7.9	15	16	20	14	19	14
Acid Extractable Cadmium (Cd)	ug/g	32	30	27	36	0.62	1.2	13	5.3	7.1	0.88	0.72	0.94	0.65	0.65
Acid Extractable Calcium (Ca)	ug/g	42000	64000	56000	57000	65000	64000	61000	60000	71000	57000	70000	57000	64000	74000
Acid Extractable Chromium (Cr)	ug/g	61	61	42	85	23	33	32	23	27	35	30	22	33	22
Acid Extractable Cobalt (Co)	ug/g	17	16	12	15	8.5	9.4	11	7.7	7.5	12	9.1	8.9	9	6.6
Acid Extractable Copper (Cu)	ug/g	130	130	110	180	51	110	76	55	91	86	87	41	120	54
Acid Extractable Iron (Fe)	ug/g	21000	28000	19000	23000	25000	25000	22000	18000	19000	23000	25000	23000	25000	21000
Acid Extractable Lead (Pb)	ug/g	140	140	110	130	41	51	74	87	110	100	44	28	45	120
Acid Extractable Magnesium (Mg)	ug/g	13000	15000	13000	13000	24000	23000	14000	8400	19000	16000	23000	17000	22000	19000
Acid Extractable Manganese (Mn)	ug/g	490	660	470	490	540	520	420	340	450	460	540	490	510	470
Acid Extractable Molybdenum (Mo)	ug/g	1.2	1.2	0.85	1.2	0.94	1.8	0.96	1.2	0.81	1	1.5	0.79	1.8	0.87
Acid Extractable Nickel (Ni)	ug/g	61	58	47	61	22	25	35	23	23	40	23	21	25	17
Acid Extractable Phosphorus (P)	ug/g	1500	1500	1300	1500	1200	1500	770	730	1100	890	1400	980	1300	850
Acid Extractable Potassium (K)	ug/g	1400	2200	1400	1600	2000	2000	1600	1200	1400	1700	2000	1700	1900	1200
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	0.65	<0.50	<0.50	0.57	<0.50	0.74	<0.50
Acid Extractable Silver (Ag)	ug/g	7.6	6	5.9	14	<0.20	0.89	2.6	1.3	4	0.64	<0.20	0.79	1.1	<0.50
Acid Extractable Sodium (Na)	ug/g	210	330	310	440	440	1600	940	710	580	1000	650	340	560	250
Acid Extractable Strontium (Sr)	ug/g	90	120	99	110	130	110	96	120	110	91	170	130	160	130
Acid Extractable Thallium (Tl)	ug/g	0.15	0.17	0.11	0.16	0.17	0.22	0.12	0.14	0.12	0.13	0.2	0.15	0.22	0.11
Acid Extractable Tin (Sn)	ug/g	15	23	16	15	3	7.9	10	20	9.2	13	4.4	2.6	5.2	20
Acid Extractable Uranium (U)	ug/g	0.67	0.69	0.55	0.69	0.56	0.77	0.6	0.78	0.55	0.59	0.65	0.63	0.74	0.54
Acid Extractable Vanadium (V)	ug/g	26	29	23	27	23	26	24	23	20	25	24	25	25	23
Acid Extractable Zinc (Zn)	ug/g	540	440	390	480	320	480	290	210	270	340	400	240	470	200
Acid Extractable Mercury (Hg)	ug/g	0.48	0.45	0.3	0.41	0.057	0.21	0.23	0.26	7.1	0.3	0.15	0.076	0.27	0.25
PAHs															
Acenaphthene	ug/g	0.24	0.53	0.69	0.3	<0.10	0.79	0.054	0.016	0.57	0.33	<0.10	<0.10	<0.10	<0.0050
Acenaphthylene	ug/g	0.053	<0.20	<0.20	<0.10	<0.10	<0.20	<0.050	0.022	0.035	0.05	<0.10	<0.10	<0.10	<0.0050
Anthracene	ug/g	0.22	0.73	0.29	0.23	0.86	0.12	0.072	0.71	0.57	0.13	<0.10	0.17	<0.0050	
Benzo(a)anthracene	ug/g	0.61	0.92	1.4	0.57	0.76	2.6	0.45	0.26	2	1.9	0.65	0.27	0.78	0.011
Benzo(a)pyrene	ug/g	0.59	0.84	1.2	0.48	0.8	2.3	0.5	0.25	1.7	1.6	0.77	0.3	0.97	0.011
Benzo(b,j)fluoranthene	ug/g	0.99	1.4	2.1	0.74	1.2	3.8	0.8	0.35	2.6	2.4	1.4	0.52	1.7	0.022
Benzo(g,h,i)perylene	ug/g	0.45	0.64	0.97	0.33	0.64	1.5	0.33	0.17	1	1	0.73	0.27	0.88	0.0098
Benzo(k)fluoranthene	ug/g	0.35	0.49	0.69	0.22	0.34	1.3	0.27	0.12	0.91	0.83	0.47	0.18	0.56	0.0068
Chrysene	ug/g	0.7	0.95	1.5	0.61	0.88	3	0.33	0.19	1.9	1.8	0.87	0.36	1	0.016
Dibenzo(a,h)anthracene	ug/g	0.1	0.14	0.22	<0.10	0.11	0.34	0.077	0.044	0.28	0.31	0.12	<0.10	0.14	<0.0050
Fluoranthene	ug/g	2	2.9	4.5	1.9	2.8	9.7	1.4	0.57	6	5	2.4	0.92	2.8	0.061
Fluorene	ug/g	0.3	0.6	0.99	0.4	0.1	0.8	<0.050	0.018	0.5	0.3	<0.10	<0.10	0.11	<0.0050
Indeno(1,2,3-cd)pyrene	ug/g	0.46	0.65	0.93	0.36	0.66	1.6	0.37	0.18	1.1	1.1	0.67	0.25	0.83	0.0093
Methylnaphthalene, 2-(1-)	ug/g	1	2.1	3.1	0.81	<0.14									
1-Methylnaphthalene	ug/g	0.62	0.94	1.6	0.51	<0.10	0.38	<0.050	0.0063	0.084	0.17	<0.10	<0.10	<0.10	<0.0050
2-Methylnaphthalene	ug/g	0.4	1.2	1.6	0.3	<0.10	0.62	<0.050	0.013	0.15	0.25	<0.10	<0.10	<0.10	<0.0050
Naphthalene	ug/g	<0.20	<0.20	<0.30	<0.10	<0.10	1.8	<0.050	0.014	0.25	0.17	<0.10	<0.10	<0.10	<0.0050
Phenanthrene	ug/g	1.4	2.9	4.4	1.1	1.3	9	0.34	0.18	4.8	4.1	0.89	0.32	1.1	0.012
Pyrene	ug/g	1.4	2	3.1	1.5	2	6.2	1.1	0.42	4.4	3.5	1.7	0.66	2	0.041
SIZE DISTRIBUTION															
< -1 Phi (2 mm)	%						99	94	100						
< 0 Phi (1 mm)	%						98	93	100						
< +1 Phi (0.5 mm)	%						95	87	98						
< +2 Phi (0.25 mm)	%						92	77	90						
< +3 Phi (0.12 mm)	%						87	73	66						
< +4 Phi (0.062 mm)	%						82	69	48						
< +5 Phi (0.031 mm)	%						67	55	40						
< +6 Phi (0.016 mm)	%						52	43	31						
< +7 Phi (0.0078 mm)	%						31	27	19						
< +8 Phi (0.0039 mm)	%						25	23	16						
< +9 Phi (0.0020 mm)	%						7.5	17	12						
Gravel	%						1.3	5.7	0.16						
Coarse Sand	%						8.5	19	20						
Fine Sand	%						8.1	6.2	32						
Silt	%						57	46	32						
Clay	%						25	23	16						
Loss on Ignition	%w/w						6.3	3.4	2.5						
Wet Bulk Density	g/cm ³						1.6	1.9	1.8						
Liquid Limit	%w/w						54	38	COMMENTS						
Plastic Limit	%w/w						22	21	COMMENTS						
Plasticity Index	%w/w						32	17	COMMENTS						
Dissolved BOD5	mg/L														

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Station	CC-C05													CC
Sample ID	CC-C05-WEST-0-15	CC-C05-WEST-15-30	CC-C05-WEST-30-45	CC-C05-WEST-45-60	CC-C05-WEST-60-75	CC-C05-WEST-75-90	CC-C05-CENTRE-0-15	CC-C05-EAST-0-15	CC-C05-EAST-15-30	CC-C24-WEST-0-15	CC-C24-WEST-15-30	CC-C24-CENTRE-0-15	CC-C24-CENTRE-15-30	
BV Labs Sample ID	PJ1863	PJ1864	PJ1865	PJ1866	PJ1867	PJ1868	PJ1862	PJ1860	PJ1861	PJ1875	PJ1876	PJ1871	PJ1872	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/20/21 10:00	4/20/21 10:00	4/20/21 10:00	4/20/21 10:00	4/20/21 10:00	4/20/21 11:00	4/20/21 9:30	4/20/21 8:00	4/20/21 9:00	4/20/21 12:00	4/20/21 12:00	4/20/21 11:30	4/20/21 11:30	
Parameter Name	Units													
PHYSICAL														
Moisture	%	42	18	33	42	49	46	24	25	35	52	27	19	18
ANIONS & NUTRIENTS														
Total Ammonia-N	ug/g	178	85	188	286	269	228	25	93	157	84	<20	<20	31
Nitrogen (N)	%	0.21	0.035	0.12	0.22	0.33	0.3	0.074	0.091	0.21	0.3	0.067	0.035	0.019
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	2080	349	1240	2200	3260	3010	736	908	2120	3010	668	353	187
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS														
Acid Extractable Aluminum (Al)	ug/g	7500	4900	9700	11000	12000	8900	8100	9700	11000	11000	9000	6600	3700
Acid Extractable Antimony (Sb)	ug/g	0.84	0.49	2.8	3	1.5	0.64	1	2.5	1.4	1.4	0.47	0.43	1
Acid Extractable Arsenic (As)	ug/g	3.7	2.9	6.2	6.5	6.2	4.5	5.3	6.1	7.1	5.9	4.5	3.5	2.6
Acid Extractable Barium (Ba)	ug/g	94	57	220	260	210	100	98	100	140	120	55	70	43
Acid Extractable Beryllium (Be)	ug/g	0.42	0.29	0.51	0.56	0.61	0.46	0.47	0.53	0.65	0.59	0.45	0.39	0.23
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	16	12	29	31	36	26	18	19	19	20	11	16	10
Acid Extractable Cadmium (Cd)	ug/g	0.66	1.5	16	29	21	4	0.98	1.3	3.2	0.94	0.49	0.58	0.63
Acid Extractable Calcium (Ca)	ug/g	64000	67000	63000	53000	64000	67000	72000	62000	55000	62000	58000	69000	67000
Acid Extractable Chromium (Cr)	ug/g	24	18	47	56	44	20	30	34	30	33	20	18	15
Acid Extractable Cobalt (Co)	ug/g	7.2	6	14	16	13	7.9	8.7	9	9.4	9.1	7.8	7.2	4.6
Acid Extractable Copper (Cu)	ug/g	79	38	120	170	140	46	62	98	87	110	46	38	89
Acid Extractable Iron (Fe)	ug/g	23000	21000	22000	21000	22000	18000	24000	35000	25000	25000	21000	19000	17000
Acid Extractable Lead (Pb)	ug/g	67	65	150	170	100	56	90	160	98	55	24	48	140
Acid Extractable Magnesium (Mg)	ug/g	18000	14000	14000	12000	11000	7800	18000	17000	11000	20000	11000	17000	12000
Acid Extractable Manganese (Mn)	ug/g	440	410	510	500	540	500	590	580	670	520	550	490	390
Acid Extractable Molybdenum (Mo)	ug/g	1	0.61	0.93	1.1	0.92	0.74	1.3	1.3	1.7	1.7	0.66	0.59	0.53
Acid Extractable Nickel (Ni)	ug/g	18	16	58	58	44	22	23	24	26	24	18	17	10
Acid Extractable Phosphorus (P)	ug/g	1200	880	1500	1700	1400	890	1200	1200	1100	1400	810	870	950
Acid Extractable Potassium (K)	ug/g	1500	1000	1600	1600	1700	1200	1700	1900	1600	1900	1400	1500	750
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	0.68	<0.50	<0.50	<0.50
Acid Extractable Silver (Ag)	ug/g	0.66	0.28	4.7	12	8	1.5	0.89	0.4	0.81	0.69	<0.20	<0.20	<0.20
Acid Extractable Sodium (Na)	ug/g	320	180	270	250	290	240	360	450	540	520	260	250	200
Acid Extractable Strontium (Sr)	ug/g	130	120	120	110	150	150	140	120	140	150	110	120	100
Acid Extractable Thallium (Tl)	ug/g	0.15	0.087	0.15	0.15	0.15	0.11	0.16	0.16	0.14	0.24	0.12	0.12	0.067
Acid Extractable Tin (Sn)	ug/g	6.8	5.1	10	15	13	7.3	21	45	25	4.6	2.2	2.8	5.7
Acid Extractable Uranium (U)	ug/g	0.66	0.5	0.64	0.64	0.65	0.47	0.7	0.57	0.63	0.77	0.79	0.49	0.44
Acid Extractable Vanadium (V)	ug/g	29	30	26	25	25	21	22	40	26	27	25	20	23
Acid Extractable Zinc (Zn)	ug/g	310	190	420	570	400	160	260	380	300	440	170	190	200
Acid Extractable Mercury (Hg)	ug/g	0.18	0.28	0.45	0.55	0.35	0.12	0.12	0.16	0.28	0.14	0.11	0.082	0.079
PAHs														
Acenaphthene	ug/g	<0.10	<0.050	0.14	0.51	0.2	<0.10	0.86	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
Acenaphthylene	ug/g	<0.10	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
Anthracene	ug/g	<0.10	<0.050	0.12	0.31	0.19	<0.10	1.7	<0.050	<0.10	0.12	<0.050	<0.050	<0.050
Benzo(a)anthracene	ug/g	<0.10	0.2	0.39	0.53	0.48	0.16	4.9	<0.050	<0.10	0.61	0.19	0.18	0.15
Benzo(a)pyrene	ug/g	<0.10	0.19	0.37	0.46	0.45	0.19	3.8	<0.050	<0.10	0.74	0.21	0.17	0.15
Benzo(b,j)fluoranthene	ug/g	<0.10	0.34	0.63	0.74	0.71	0.22	5.3	0.077	0.13	1.2	0.36	0.28	0.25
Benzo(g,h,i)perylene	ug/g	<0.10	0.14	0.3	0.29	0.33	0.13	2.1	<0.050	<0.10	0.62	0.18	0.13	0.11
Benzo(k)fluoranthene	ug/g	<0.10	0.12	0.22	0.21	0.26	<0.10	1.6	<0.050	<0.10	0.4	0.1	0.082	0.081
Chrysene	ug/g	<0.10	0.25	0.43	0.57	0.49	0.17	4.9	0.05	<0.10	0.81	0.31	0.22	0.18
Dibenzo(a,h)anthracene	ug/g	<0.10	<0.050	0.055	<0.10	<0.10	<0.10	0.52	<0.050	<0.10	0.11	<0.050	<0.050	<0.050
Fluoranthene	ug/g	0.14	0.78	1.3	1.8	1.4	0.37	15	0.17	0.26	2.5	0.68	0.62	0.54
Fluorene	ug/g	<0.10	<0.050	0.19	<0.50	0.19	<0.10	0.79	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	ug/g	<0.10	0.14	0.3	0.33	0.34	0.14	2.4	<0.050	<0.10	0.62	0.18	0.13	0.11
Methylnaphthalene, 2-(1-)	ug/g	<0.14	<0.071	0.25	0.79	0.53	<0.14	0.34	<0.071	<0.14	<0.14	<0.071	<0.071	<0.071
1-Methylnaphthalene	ug/g	<0.10	<0.050	0.19	0.61	0.39	<0.10	0.13	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
2-Methylnaphthalene	ug/g	<0.10	<0.050	0.062	0.18	0.15	<0.10	0.21	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
Naphthalene	ug/g	<0.10	<0.050	0.058	<0.10	<0.10	<0.10	0.77	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050
Phenanthrene	ug/g	<0.10	0.38	0.93	1.5	1.1	0.25	11	0.092	0.14	0.96	0.18	0.19	0.22
Pyrene	ug/g	0.1	0.53	0.9	1.4	0.98	0.31	11	0.12	0.2	1.9	0.52	0.46	0.37
SIZE DISTRIBUTION														
< -1 Phi (2 mm)	%													
< 0 Phi (1 mm)	%													
< +1 Phi (0.5 mm)	%													
< +2 Phi (0.25 mm)	%													
< +3 Phi (0.12 mm)	%													
< +4 Phi (0.062 mm)	%													
< +5 Phi (0.031 mm)	%													
< +6 Phi (0.016 mm)	%													
< +7 Phi (0.0078 mm)	%													
< +8 Phi (0.0039 mm)	%													
< +9 Phi (0.0020 mm)	%													
Gravel	%													
Coarse Sand	%													
Fine Sand	%													
Silt	%													
Clay	%													
Loss on Ignition	%w/w													
Wet Bulk Density	g/cm ³													
Liquid Limit	%w/w													
Plastic Limit	%w/w													
Plasticity Index	%w/w													
Dissolved BOD5	mg/L	7						<20						

Table A1. Chedoke Creek Sediment Sample Analytical Results - April 2021

Parameter Name	Units	
Station		
Sample ID		CC-C26-EAST-45-60
BV Labs Sample ID		PJT419
Matrix		Solid
Sampled By		SB
Sampling Date and Time		4/21/21 9:00
PHYSICAL		
Moisture	%	41
ANIONS & NUTRIENTS		
Total Ammonia-N	ug/g	462
Nitrogen (N)	%	0.19
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1900
Nitrite (N)	ug/g	<0.5
Nitrate (N)	ug/g	<2
Nitrate + Nitrite (N)	ug/g	<3
METALS		
Acid Extractable Aluminum (Al)	ug/g	12000
Acid Extractable Antimony (Sb)	ug/g	3.8
Acid Extractable Arsenic (As)	ug/g	8.9
Acid Extractable Barium (Ba)	ug/g	320
Acid Extractable Beryllium (Be)	ug/g	0.63
Acid Extractable Bismuth (Bi)	ug/g	1.1
Acid Extractable Boron (B)	ug/g	65
Acid Extractable Cadmium (Cd)	ug/g	26
Acid Extractable Calcium (Ca)	ug/g	58000
Acid Extractable Chromium (Cr)	ug/g	72
Acid Extractable Cobalt (Co)	ug/g	20
Acid Extractable Copper (Cu)	ug/g	150
Acid Extractable Iron (Fe)	ug/g	26000
Acid Extractable Lead (Pb)	ug/g	190
Acid Extractable Magnesium (Mg)	ug/g	15000
Acid Extractable Manganese (Mn)	ug/g	600
Acid Extractable Molybdenum (Mo)	ug/g	2.8
Acid Extractable Nickel (Ni)	ug/g	76
Acid Extractable Phosphorus (P)	ug/g	2000
Acid Extractable Potassium (K)	ug/g	1700
Acid Extractable Selenium (Se)	ug/g	0.67
Acid Extractable Silver (Ag)	ug/g	7.6
Acid Extractable Sodium (Na)	ug/g	320
Acid Extractable Strontium (Sr)	ug/g	130
Acid Extractable Thallium (Tl)	ug/g	0.17
Acid Extractable Tin (Sn)	ug/g	17
Acid Extractable Uranium (U)	ug/g	0.67
Acid Extractable Vanadium (V)	ug/g	26
Acid Extractable Zinc (Zn)	ug/g	690
Acid Extractable Mercury (Hg)	ug/g	0.57
PAHs		
Acenaphthene	ug/g	0.56
Acenaphthylene	ug/g	<0.050
Anthracene	ug/g	0.26
Benzo(a)anthracene	ug/g	0.48
Benzo(a)pyrene	ug/g	0.43
Benzo(b,j)fluoranthene	ug/g	0.7
Benzo(g,h,i)perylene	ug/g	0.31
Benzo(k)fluoranthene	ug/g	0.21
Chrysene	ug/g	0.51
Dibenzo(a,h)anthracene	ug/g	0.053
Fluoranthene	ug/g	1.6
Fluorene	ug/g	0.36
Indeno(1,2,3-cd)pyrene	ug/g	0.34
Methylnaphthalene, 2-(1-)	ug/g	0.32
1-Methylnaphthalene	ug/g	0.2
2-Methylnaphthalene	ug/g	0.12
Naphthalene	ug/g	<0.050
Phenanthrene	ug/g	1.3
Pyrene	ug/g	1.3
SIZE DISTRIBUTION		
< -1 Phi (2 mm)	%	
< 0 Phi (1 mm)	%	
< +1 Phi (0.5 mm)	%	
< +2 Phi (0.25 mm)	%	
< +3 Phi (0.12 mm)	%	
< +4 Phi (0.062 mm)	%	
< +5 Phi (0.031 mm)	%	
< +6 Phi (0.016 mm)	%	
< +7 Phi (0.0078 mm)	%	
< +8 Phi (0.0039 mm)	%	
< +9 Phi (0.0020 mm)	%	
Gravel	%	
Coarse Sand	%	
Fine Sand	%	
Silt	%	
Clay	%	
Loss on Ignition	%w/w	
Wet Bulk Density	g/cm ³	
Liquid Limit	%w/w	
Plastic Limit	%w/w	
Plasticity Index	%w/w	
Dissolved BOD5	mg/L	

Table A2. Princess Point Sediment Sample Analytical Results - April 2021

Station	PP-C01				PP-C02				PP-C03				PP-C04				PP-C05					
	Sample ID	PP-C01-15-30	PP-C01-30-45	PP-C01-45-60	PP-C02-0-15	PP-C02-15-30	PP-C02-30-45	PP-C03-0-15	PP-C03-15-30	PP-C03-30-45	PP-C03-45-60	PP-C03-60-75	PP-C03-75-90	PP-C04-0-15	PP-C04-15-30	PP-C04-30-45	PP-C04-45-60	PP-C05-0-15	PP-C05-15-30	PP-C05-30-45	PP-C05-45-60	
BV Labs Sample ID	PJT428	PJT429	PJT430	PJT431	PJT432	PJT433	PJT434	PJT435	PJT436	PJT437	PJT438	PJT439	PJT440	PJT441	PJT442	PJT443	PJT444	PJ888	PJ889	PJ890	PJ891	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	
Sampling Date and Time	4/21/21 11:00	4/21/21 11:00	4/21/21 11:00	4/21/21 11:00	4/21/21 11:30	4/21/21 11:30	4/21/21 11:30	4/21/21 13:00	4/21/21 13:00	4/21/21 13:00	4/21/21 13:00	4/21/21 13:00	4/21/21 13:00	4/21/21 14:30	4/21/21 14:30	4/21/21 14:30	4/21/21 14:30	4/20/21 14:45	4/20/21 14:45	4/20/21 14:45	4/20/21 14:45	
Parameter Name	Units																					
PHYSICAL																						
Moisture	%	44	33	31	27	19	23	21	21	20	21	21	36	30	46	33	29	28	51	36	35	38
ANIONS & NUTRIENTS																						
Total Ammonia-N	ug/g	161	209	234	239	48	126	158	31	85	130	144	363	298	159	165	211	290	113	178	216	367
Nitrogen (N)	%	0.23	0.14	0.14	0.12	0.04	0.069	0.064	0.049	0.047	0.07	0.065	0.2	0.16	0.23	0.14	0.12	0.14	0.27	0.14	0.14	0.17
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	2340	1350	1360	1160	397	693	643	490	467	704	648	2050	1610	2280	1430	1220	1390	2740	1390	1390	1720
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																						
Acid Extractable Aluminum (Al)	ug/g	9800	8100	7600	8500	4800	5900	7600	5400	6000	6200	4800	13000	9900	10000	8700	8400	8000	10000	8800	7900	11000
Acid Extractable Antimony (Sb)	ug/g	0.95	0.59	0.83	0.64	0.63	0.48	0.41	0.43	0.59	0.72	6	3.2	0.92	0.58	0.52	0.97	0.92	0.74	0.73	1.8	
Acid Extractable Arsenic (As)	ug/g	4.9	4.8	4.7	4.3	2.6	3.4	4.2	2.8	3.4	3.3	4.2	8.8	6.8	4.4	5	5.1	4.3	5.1	4.9	6.4	
Acid Extractable Barium (Ba)	ug/g	100	83	90	89	50	60	85	52	64	73	62	300	170	110	86	86	110	84	88	140	
Acid Extractable Beryllium (Be)	ug/g	0.51	0.47	0.46	0.46	0.26	0.34	0.45	0.31	0.35	0.38	0.31	0.45	0.7	0.53	0.47	0.45	0.48	0.56	0.49	0.6	
Acid Extractable Bismuth (Bi)	ug/g	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.6	3.1	1	<1.0	<1.0	1	1.5	<1.0	<1.0	
Acid Extractable Boron (B)	ug/g	25	29	40	48	13	20	31	13	25	22	13	72	57	29	29	38	58	25	27	37	80
Acid Extractable Cadmium (Cd)	ug/g	0.95	1.2	1.4	1.5	0.6	0.98	1.1	0.53	0.88	1.3	2.1	40	37	0.86	1	1.2	2.4	0.89	1.1	1.2	3.9
Acid Extractable Calcium (Ca)	ug/g	71000	73000	63000	69000	74000	70000	68000	73000	68000	66000	70000	62000	80000	74000	73000	67000	64000	70000	71000	66000	63000
Acid Extractable Chromium (Cr)	ug/g	30	26	27	29	15	24	24	16	19	22	18	91	79	31	26	26	34	31	26	25	43
Acid Extractable Cobalt (Co)	ug/g	8.7	8.1	7.8	5.8	5.1	6.5	7.7	5.8	6.1	7.4	7.8	18	8.8	8.9	8.2	7.8	10	8.8	8	7.7	13
Acid Extractable Copper (Cu)	ug/g	80	57	61	58	61	66	75	60	67	59	64	170	170	88	54	57	79	90	54	56	100
Acid Extractable Iron (Fe)	ug/g	23000	21000	21000	22000	15000	17000	20000	17000	18000	19000	15000	26000	23000	23000	21000	20000	22000	23000	21000	20000	23000
Acid Extractable Lead (Pb)	ug/g	40	48	69	91	31	54	100	41	73	100	84	210	160	40	40	61	130	44	44	63	160
Acid Extractable Magnesium (Mg)	ug/g	21000	20000	17000	16000	14000	15000	15000	14000	15000	14000	17000	18000	22000	21000	17000	17000	22000	20000	18000	17000	
Acid Extractable Manganese (Mn)	ug/g	520	540	510	550	440	450	510	430	450	500	440	570	530	530	550	520	560	530	540	520	590
Acid Extractable Molybdenum (Mo)	ug/g	1.2	0.92	0.84	1	0.51	0.96	0.76	0.54	1	0.87	<0.50	1.3	0.86	1.1	1.4	0.91	0.78	1.1	0.84	1.2	
Acid Extractable Nickel (Ni)	ug/g	22	20	21	25	13	19	22	15	17	22	20	79	48	22	20	20	27	23	20	21	36
Acid Extractable Phosphorus (P)	ug/g	1200	1100	1200	780	890	1100	830	920	1100	2000	1600	1200	1000	1000	1200	1300	1200	1000	1200	1500	
Acid Extractable Potassium (K)	ug/g	1700	1400	1300	1500	1000	1000	1400	1100	1200	1200	780	2000	1700	1900	1600	1400	1300	1900	1700	1300	1700
Acid Extractable Selenium (Se)	ug/g	0.52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	0.6	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	0.61
Acid Extractable Silver (Ag)	ug/g	0.51	0.32	0.94	0.79	0.21	0.54	0.67	<0.20	0.34	1.4	1.2	11	7.3	0.63	0.29	0.6	2.3	0.53	0.34	0.55	3.4
Acid Extractable Sodium (Na)	ug/g	440	290	270	210	260	200	270	180	190	160	290	260	470	290	270	430	300	290	290	410	
Acid Extractable Strontium (Sr)	ug/g	180	160	130	130	120	120	120	120	110	100	130	120	180	150	130	120	170	160	140	130	
Acid Extractable Thallium (Tl)	ug/g	0.19	0.16	0.14	0.12	0.099	0.12	0.12	0.11	0.12	0.1	0.078	0.19	0.17	0.21	0.16	0.15	0.13	0.2	0.17	0.16	0.16
Acid Extractable Tin (Sn)	ug/g	4	3	5.4	16	2.9	3.5	13	4.1	4.8	5.8	5.9	27	23	4.3	3.9	6	10	5.5	3.2	5.6	12
Acid Extractable Uranium (U)	ug/g	0.62	0.53	0.49	0.51	0.42	0.46	0.66	0.45	0.5	0.48	0.4	0.75	0.59	0.66	0.55	0.49	0.53	0.71	0.58	0.51	0.55
Acid Extractable Vanadium (V)	ug/g	23	22	22	24	18	19	20	20	20	15	27	23	24	21	21	21	24	23	21	24	
Acid Extractable Zinc (Zn)	ug/g	370	310	280	270	180	210	260	150	210	260	200	590	380	290	270	360	380	310	280	470	
Acid Extractable Mercury (Hg)	ug/g	0.15	0.13	0.36	0.3	0.28	0.15	0.29	0.065	0.51	0.45	0.62	0.93	0.66	0.14	0.1	0.27	0.44	0.18	0.18	0.24	0.49
PAHs																						
Acenaphthene	ug/g	<0.10	<0.050	0.074	0.073	<0.050	0.12	<0.050	0.082	<0.050	0.13	<0.050	0.36	0.27	<0.10	<0.050	0.057	0.14	0.72	0.051	0.11	0.25
Acenaphthylene	ug/g	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.050
Anthracene	ug/g	<0.10	0.085	0.12	0.11	<0.050	0.22	0.077	0.11	<0.050	0.19	<0.050	0.37	0.19	0.1	0.093	0.091	0.15	0.78	0.1	0.22	0.25
Benzo(a)anthracene	ug/g	0.4	0.54	0.68	0.5	0.15	0.66	0.28	0.51	0.19	0.54	0.66	1.1	0.57	0.72	0.63	0.52	0.54	3.1	0.56	0.87	0.65
Benzo(a)pyrene	ug/g	0.48	0.61	0.76	0.46	0.15	0.62	0.27	0.46	0.18	0.45	0.14	1.1	0.59	0.85	0.71	0.57	0.53	2.8	0.61	0.83	0.61
Benzo(b)fluoranthene	ug/g	0.79	0.98	1.1	0.69	0.26	0.94	0.43	0.67	0.29	0.63	0.2	1.4	0.87	1.3	1.1	0.86	0.79	4.2	1	1.2	0.9
Benzo(g,h)perylene	ug/g	0.42	0.54	0.56	0.35	0.13	0.4	0.21	0.34	0.13	0.3	0.11	0.73	0.5	0.7	0.57	0.44	0.39	1.7	0.45	0.55	0.38
Benzo(k)fluoranthene	ug/g	0.22	0.36	0.35	0.22	0.079	0.3	0.13	0.24	0.084	0.19	0.061	0.44	0.24	0.48	0.33	0.29	0.24	1.6	0.29	0.41	0.28
Chrysene	ug/g	0.58	0.66	0.87	0.58	0.2	0.69	0.34	0.59	0.24	0.51	0.16	1	0.65	1.1	0.79	0.63	0.61	3.2	0.7	1.1	0.67
Dibenz(a,h)anthracene	ug/g	<0.10	0.077	0.089	0.057	<0.050	0.11	<0.050	0.052	<0.050	0.056	<0.050	0.14	0.091	<0.10	0.081	0.069	0.079	0.47	0.099	0.12	0.091
Fluoranthene	ug/g	1.5	1.7	2.1	1.5	0.54	2.1	0.91														

Table A2. Princess Point Sediment Sample Analytical Results - April 2021

Station	PP-C06					PP-C07					PP-C08					PP-C09					PP-C11-0-15	PP-C11-15-30
Sample ID	PP-C06-0-15	PP-C06-15-30	PP-C06-30-45	PP-C06-45-60	PP-C06-60-75	PP-C07-0-15	PP-C07-15-30	PP-C07-30-45	PP-C07-45-60	PP-C07-60-75	PP-C08-0-15	PP-C08-15-30	PP-C08-30-45	PP-C08-45-60	PP-C09-0-15	PP-C09-15-30	PP-C09-30-45	PP-C09-45-60	PP-C09-60-75	PP-C11-0-15	PP-C11-15-30	
BV Labs Sample ID	PKV679	PKV680	PKV681	PKV682	PKV683	PKV684	PKV685	PKV686	PKV687	PKV688	PKV675	PKV676	PKV677	PKV678	PJ2020	PJ2021	PJ2022	PJ2023	PJ2024	PJ2014	PJ2015	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/23/21 9:30	4/23/21 9:30	4/23/21 9:30	4/23/21 9:30	4/23/21 9:30	4/23/21 10:30	4/23/21 10:30	4/23/21 10:30	4/23/21 10:30	4/23/21 10:30	4/23/21 9:00	4/23/21 9:00	4/23/21 9:00	4/23/21 9:00	4/22/21 13:00	4/22/21 14:30	4/22/21 14:30	4/22/21 14:30	4/22/21 14:30	4/22/21 13:00	4/22/21 13:00	
Parameter Name	Units																					
PHYSICAL																						
Moisture	%	51	44	37	41	44	45	35	36	32	30	33	23	23	20	46	42	33	35	38	59	48
ANIONS & NUTRIENTS																						
Total Ammonia-N	ug/g	46	80	166	305	281	26	82	146	157	172	41	81	96	104	<20	68	151	233	279	50	161
Nitrogen (N)	%	0.23	0.14	0.14	0.18	0.19	0.18	0.12	0.14	0.11	0.14	0.14	0.049	0.058	0.069	0.1	0.049	0.058	0.069	0.1	0.049	0.058
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	2260	1370	1440	1750	1940	1760	1210	1430	1090	1040	1370	491	577	693	1780	1730	1370	1550	1850	2720	1960
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																						
Acid Extractable Aluminum (Al)	ug/g	11000	9300	9800	11000	11000	9700	8200	8900	7600	7600	7800	5800	5500	6600	10000	11000	9800	11000	12000	14000	14000
Acid Extractable Antimony (Sb)	ug/g	0.78	0.67	1	3.6	3.3	0.75	0.6	0.64	0.65	0.57	0.64	0.36	0.37	0.84	0.78	0.67	0.64	0.77	1.8	0.79	0.7
Acid Extractable Arsenic (As)	ug/g	4.6	4.9	5.6	9.2	7.3	4.7	4.6	4.1	4.1	3.3	3.3	2.9	3.3	5.3	5.8	5	5.4	7.4	5.9	6.5	6.5
Acid Extractable Barium (Ba)	ug/g	110	84	120	240	220	90	77	84	78	77	60	56	71	94	110	110	120	190	120	130	130
Acid Extractable Beryllium (Be)	ug/g	0.52	0.44	0.5	0.64	0.57	0.4	0.46	0.4	0.4	0.43	0.3	0.3	0.36	0.64	0.56	0.51	0.57	0.64	0.66	0.67	0.67
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	16	15	32	50	48	18	20	31	35	38	20	18	22	16	21	24	42	57	18	23	23
Acid Extractable Cadmium (Cd)	ug/g	1	1.2	3	22	18	0.8	0.95	1.2	1	0.9	0.64	0.52	0.61	1.4	1.7	1.6	1.9	6	2.1	2.7	2.7
Acid Extractable Calcium (Ca)	ug/g	75000	75000	65000	63000	62000	75000	73000	68000	68000	72000	71000	70000	71000	78000	77000	69000	66000	65000	87000	84000	84000
Acid Extractable Chromium (Cr)	ug/g	29	25	33	54	48	23	23	27	23	21	16	17	20	29	32	28	38	55	35	36	36
Acid Extractable Cobalt (Co)	ug/g	9	8.4	18	17	8.5	7.7	7.8	7.2	7.2	7.2	5.7	5.7	6.8	9	9.1	8.4	10	14	10	11	11
Acid Extractable Copper (Cu)	ug/g	77	54	72	100	100	60	51	61	58	50	53	48	49	67	77	69	82	130	92	89	89
Acid Extractable Iron (Fe)	ug/g	23000	21000	22000	24000	19000	22000	20000	21000	18000	19000	15000	15000	18000	23000	23000	22000	24000	26000	27000	28000	28000
Acid Extractable Lead (Pb)	ug/g	42	44	110	190	160	37	40	56	65	80	30	32	41	56	47	77	130	180	57	77	77
Acid Extractable Magnesium (Mg)	ug/g	22000	19000	18000	17000	17000	24000	22000	20000	20000	23000	16000	17000	19000	23000	20000	18000	17000	17000	18000	17000	17000
Acid Extractable Manganese (Mn)	ug/g	590	560	590	620	590	560	550	550	560	550	510	470	450	510	560	580	600	620	610	670	670
Acid Extractable Molybdenum (Mo)	ug/g	1.1	1	0.81	1	0.92	1.4	0.81	0.87	0.65	0.84	0.51	<0.50	0.63	1.5	1.1	0.88	0.98	1.1	1.5	1.2	1.2
Acid Extractable Nickel (Ni)	ug/g	23	21	28	66	59	21	19	20	20	17	14	15	17	22	24	24	30	40	27	29	29
Acid Extractable Phosphorus (P)	ug/g	1200	890	1300	1800	1700	960	920	1100	1000	960	770	780	1100	840	1000	1300	1300	1700	1100	1200	1200
Acid Extractable Potassium (K)	ug/g	1800	1400	1500	1700	1700	1900	1400	1500	1200	1300	1500	1100	1000	1300	1700	1800	1400	1500	2000	2200	2100
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	0.56	0.53	0.54	0.76	0.68	0.7
Acid Extractable Silver (Ag)	ug/g	0.56	0.51	1.8	4.9	4.8	0.41	0.3	0.41	1	0.59	0.29	0.22	<0.20	1.2	0.51	0.68	0.94	1.6	5.4	0.76	1.1
Acid Extractable Sodium (Na)	ug/g	420	280	280	300	280	210	370	280	250	370	260	160	200	310	370	230	280	310	560	440	440
Acid Extractable Strontium (Sr)	ug/g	190	180	140	140	130	170	150	150	120	120	140	120	110	190	180	130	130	140	300	240	240
Acid Extractable Thallium (Tl)	ug/g	0.23	0.18	0.16	0.17	0.16	0.19	0.14	0.13	0.11	0.15	0.093	0.11	0.098	0.21	0.2	0.16	0.17	0.19	0.25	0.24	0.24
Acid Extractable Tin (Sn)	ug/g	3.8	3	7.7	10	11	3.2	3.1	5.1	5.8	5.2	3.6	3.3	7.7	8.2	3.5	4.9	5	8.1	16	4.6	5.5
Acid Extractable Uranium (U)	ug/g	0.61	0.55	0.52	0.61	0.61	0.63	0.52	0.5	0.47	0.46	0.53	0.4	0.39	0.45	0.65	0.65	0.6	0.52	0.57	0.69	0.57
Acid Extractable Vanadium (V)	ug/g	22	20	21	24	23	21	20	20	18	18	18	14	15	17	21	23	20	23	25	25	26
Acid Extractable Zinc (Zn)	ug/g	390	320	370	580	510	310	260	290	230	220	230	150	170	180	380	390	330	410	600	500	480
Acid Extractable Mercury (Hg)	ug/g	0.12	0.22	0.39	0.48	0.71	0.12	0.12	0.21	0.5	0.31	0.092	0.094	0.098	0.38	0.16	0.33	0.37	0.4	0.49	0.17	0.26
PAHs																						
Acenaphthene	ug/g	<0.10	<0.10	0.085	0.11	0.12	<0.10	0.088	0.061	0.17	0.11	0.24	<0.050	0.084	0.12	<0.10	<0.10	0.065	0.078	0.07	<0.10	<0.10
Acenaphthylene	ug/g	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10
Anthracene	ug/g	<0.10	<0.10	0.092	0.14	0.2	<0.10	0.19	0.11	0.24	0.25	0.48	0.076	0.16	0.17	0.11	0.17	0.14	0.16	0.14	<0.10	<0.10
Benzo(a)anthracene	ug/g	0.51	0.47	0.43	0.47	0.76	0.46	0.88	0.54	0.81	0.69	1.3	0.88	0.34	0.59	0.61	0.6	0.74	0.61	0.51	0.41	0.45
Benzo(a)pyrene	ug/g	0.65	0.59	0.48	0.46	0.75	0.6	0.89	0.61	0.82	0.68	1.3	0.37	0.57	0.63	0.79	0.86	0.7	0.74	0.57	0.64	0.64
Benzo(b)fluoranthene	ug/g	1	0.86	0.86	1	1.4	1	1.4	1	1.2	0.95	1.8	0.58	0.94	1	1.4	1.4	1.1	1.2	0.91	1	1.1
Benzo(g,h)perylene	ug/g	0.62	0.47	0.36	0.37	0.55	0.49	0.65	0.43	0.5	0.49	0.96	0.31	0.38	0.42	0.83	0.81	0.66	0.69	0.56	0.67	0.71
Benzo(k)fluoranthene	ug/g	0.34	0.29	0.42	0.24	0.38	0.31	0.42	0.32	0.43	0.34	0.63	0.19	0.33	0.31	0.45	0.5	0.4	0.37	0.31	0.35	0.38
Chrysene	ug/g	0.67	0.63	0.52	0.51	0.75	0.61	1	0.69	0.8	0.69	1.4	0.4	0.64	0.66	0.74	0.96	0.76	0.75	0.57	0.55	0.66
Dibenz(a,h)anthracene	ug/g	<0.10	<0.10	0.058	<0.10	0.12	<0.10	0.1	0.071	0.088	0.12	0.19	0.056	0.066	0.07	0.17	0.16	0.13	0.14	0.12	0.11	

Table A2. Princess Point Sediment Sample Analytical Results - April 2021

Station	PP-C11				PP-C12			
	PP-C11-30-45	PP-C11-45-60	PP-C11-60-75	PP-C11-75-90	PP-C12-0-15	PP-C12-15-30	PP-C12-30-45	
Sample ID	PJ2016	PJ2017	PJ2018	PJ2019	PJT445	PJT446	PJT447	
BV Labs Sample ID								
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	TB	TB	TB	TB	SB	SB	SB	
Sampling Date and Time	4/22/21 13:00	4/22/21 13:00	4/22/21 13:00	4/22/21 13:00	4/21/21 14:00	4/21/21 14:00	4/21/21 14:00	
Parameter Name	Units							
PHYSICAL								
Moisture	%	43	41	40	40	32	27	31
ANIONS & NUTRIENTS								
Total Ammonia-N	ug/g	262	303	367	378	92	141	153
Nitrogen (N)	%					0.16	0.1	0.15
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1830	2100	2580	2510	1570	1050	1500
Nitrite (N)	ug/g					<0.5	<0.5	<0.5
Nitrate (N)	ug/g					<2	<2	<2
Nitrate + Nitrite (N)	ug/g					<3	<3	<3
METALS								
Acid Extractable Aluminum (Al)	ug/g	14000	13000	15000	15000	7600	7200	7600
Acid Extractable Antimony (Sb)	ug/g	0.74	2.6	4.8	2.2	0.62	0.58	0.68
Acid Extractable Arsenic (As)	ug/g	6.8	7.8	9.7	8.8	3.2	3.7	3.8
Acid Extractable Barium (Ba)	ug/g	150	230	280	220	76	72	79
Acid Extractable Beryllium (Be)	ug/g	0.64	0.68	0.74	0.69	0.46	0.4	0.45
Acid Extractable Bismuth (Bi)	ug/g	<1.0	1.1	2.3	1.9	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	27	36	53	49	31	42	43
Acid Extractable Cadmium (Cd)	ug/g	4.1	24	53	48	0.78	0.94	1.2
Acid Extractable Calcium (Ca)	ug/g	74000	65000	63000	71000	70000	70000	71000
Acid Extractable Chromium (Cr)	ug/g	45	77	110	150	23	22	25
Acid Extractable Cobalt (Co)	ug/g	12	18	17	17	7.5	7.3	7.3
Acid Extractable Copper (Cu)	ug/g	110	150	210	190	58	49	59
Acid Extractable Iron (Fe)	ug/g	28000	28000	30000	29000	19000	19000	19000
Acid Extractable Lead (Pb)	ug/g	130	170	210	170	48	40	48
Acid Extractable Magnesium (Mg)	ug/g	15000	14000	16000	14000	21000	21000	19000
Acid Extractable Manganese (Mn)	ug/g	720	660	630	650	480	510	490
Acid Extractable Molybdenum (Mo)	ug/g	0.93	1.1	1.3	1.2	0.83	0.69	0.87
Acid Extractable Nickel (Ni)	ug/g	35	71	70	68	18	18	19
Acid Extractable Phosphorus (P)	ug/g	1700	2200	2300	2500	900	900	1000
Acid Extractable Potassium (K)	ug/g	1900	1800	2100	1900	1600	1500	1500
Acid Extractable Selenium (Se)	ug/g	0.7	0.77	0.7	0.58	<0.50	<0.50	<0.50
Acid Extractable Silver (Ag)	ug/g	2.9	7.3	12	7.8	0.33	0.3	0.51
Acid Extractable Sodium (Na)	ug/g	340	320	340	290	240	200	240
Acid Extractable Strontium (Sr)	ug/g	180	150	130	110	140	120	140
Acid Extractable Thallium (Tl)	ug/g	0.21	0.24	0.24	0.23	0.15	0.14	0.16
Acid Extractable Tin (Sn)	ug/g	11	18	35	30	4.5	2.6	3.4
Acid Extractable Uranium (U)	ug/g	0.45	0.62	0.69	0.68	0.55	0.52	0.53
Acid Extractable Vanadium (V)	ug/g	25	28	28	26	20	19	20
Acid Extractable Zinc (Zn)	ug/g	540	660	1000	990	270	230	280
Acid Extractable Mercury (Hg)	ug/g	0.37	0.57	0.93	0.76	0.77	0.12	0.38
PAHS								
Acenaphthene	ug/g	<0.10	0.12	0.2	0.13	<0.10	<0.050	0.098
Acenaphthylene	ug/g	<0.10	<0.10	<0.050	<0.10	<0.10	<0.050	<0.050
Anthracene	ug/g	<0.10	0.25	0.32	0.15	<0.10	0.092	0.19
Benzo(a)anthracene	ug/g	0.53	0.74	0.94	0.59	0.46	0.56	0.88
Benzo(a)pyrene	ug/g	0.66	0.81	0.98	0.66	0.52	0.57	0.88
Benzo(b)fluoranthene	ug/g	1.1	1.2	1.5	1.1	0.83	0.89	1.3
Benzo(g,h)perylene	ug/g	0.66	0.67	0.93	0.7	0.44	0.45	0.63
Benzo(k)fluoranthene	ug/g	0.39	0.41	0.55	0.36	0.27	0.25	0.46
Chrysene	ug/g	0.69	0.8	1.1	0.69	0.53	0.59	0.96
Dibenzo(a,h)anthracene	ug/g	0.13	0.16	0.22	0.15	<0.10	0.09	0.1
Fluoranthene	ug/g	1.8	2.1	2.6	1.5	1.6	1.6	2.7
Fluorene	ug/g	<0.10	0.15	0.28	0.14	<0.10	<0.050	0.096
Indeno(1,2,3-cd)pyrene	ug/g	0.64	0.69	0.94	0.69	0.46	0.5	0.69
Methylnaphthalene, 2-(1-)	ug/g	<0.14	<0.14	0.23	<0.14	<0.14	<0.071	<0.071
1-Methylnaphthalene	ug/g	<0.10	<0.10	0.071	<0.10	<0.10	<0.050	<0.050
2-Methylnaphthalene	ug/g	<0.10	<0.10	0.16	0.13	<0.10	<0.050	<0.050
Naphthalene	ug/g	<0.10	<0.10	0.081	<0.10	<0.10	<0.050	<0.050
Phenanthrene	ug/g	0.59	1.1	1.9	0.84	0.67	0.54	1
Pyrene	ug/g	1.4	1.7	1.9	1.2	1.2	1.3	2.1
SIZE DISTRIBUTION								
< -1 Phi (2 mm)	%							
< 0 Phi (1 mm)	%							
< +1 Phi (0.5 mm)	%							
< +2 Phi (0.25 mm)	%							
< +3 Phi (0.12 mm)	%							
< +4 Phi (0.062 mm)	%							
< +5 Phi (0.031 mm)	%							
< +6 Phi (0.016 mm)	%							
< +7 Phi (0.0078 mm)	%							
< +8 Phi (0.0039 mm)	%							
< +9 Phi (0.0020 mm)	%							
Gravel	%							
Coarse Sand	%							
Fine Sand	%							
Silt	%							
Clay	%							
Loss on Ignition	%w/w							
Wet Bulk Density	g/cm3							
Liquid Limit	%w/w							
Plastic Limit	%w/w							
Plasticity Index	%w/w							
Dissolved BOD5	mg/L							

Table A3. Cootes Paradise Sediment Sample Analytical Results - April 2021

Station	CP-C04				CP-C05						CP-C06		CP-C07				
	Sample ID	CP-C04-30-45	CP-C04-45-60	CP-C04-60-75	CP-C04-75-90	CP-C05-0-15	CP-C05-15-30	CP-C05-30-45	CP-C05-45-60	CP-C05-60-75	CP-C05-75-90	CP-C06-0-15	CP-C06-15-30	CP-C07-0-15	CP-C07-15-30	CP-C07-30-45	CP-C07-45-60
BV Labs Sample ID	PKV719	PKV720	PKV721	PKV722	PKV689	PKV690	PKV691	PKV692	PKV693	PKV694	PKV695	PKV696	PKV712	PKV713	PKV714	PKV715	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/26/21 12:30	4/26/21 12:30	4/26/21 12:30	4/26/21 12:30	4/23/21 11:30	4/23/21 11:30	4/23/21 11:30	4/23/21 11:30	4/23/21 11:30	4/23/21 11:30	4/23/21 13:30	4/23/21 13:30	4/26/21 11:30	4/26/21 11:30	4/26/21 11:30	4/26/21 11:30	
Parameter Name	Units																
PHYSICAL																	
Moisture	%	39	34	34	35	48	41	37	40	38	39	28	45	55	44	40	37
ANIONS & NUTRIENTS																	
Total Ammonia-N	ug/g	123	169	162	208	<20	50	66	68	68	71	<20	66	24	110	173	185
Nitrogen (N)	%	0.14	0.14	0.14	0.12	0.19	0.15	0.14	0.15	0.19	0.18	0.094	0.37	0.21	0.15	0.15	0.15
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	1390	1360	1490	1220	1920	1490	1410	1540	1930	1800	944	3690	2070	1530	1450	1450
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																	
Acid Extractable Aluminum (Al)	ug/g	10000	10000	10000	8600	11000	11000	11000	12000	11000	13000	5100	8200	11000	11000	12000	10000
Acid Extractable Antimony (Sb)	ug/g	0.45	0.49	0.5	0.56	0.54	0.65	2	3.1	2.3	2.1	0.25	<0.20	0.6	0.53	0.45	0.83
Acid Extractable Arsenic (As)	ug/g	5.1	5	5.5	4.6	5	5.4	7	8.5	6.9	7.3	2.7	3.1	5.1	5.6	5.7	5.7
Acid Extractable Barium (Ba)	ug/g	100	100	110	93	98	100	160	220	190	160	44	69	97	100	110	120
Acid Extractable Beryllium (Be)	ug/g	0.52	0.5	0.53	0.43	0.51	0.49	0.59	0.64	0.58	0.61	0.25	0.33	0.56	0.53	0.58	0.52
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	20	32	35	36	13	19	28	26	32	36	<5.0	8.9	15	19	25	35
Acid Extractable Cadmium (Cd)	ug/g	1.2	1.4	1.6	1.5	1.1	1.5	5.4	18	31	35	0.42	0.15	0.98	1.3	1.5	2.3
Acid Extractable Calcium (Ca)	ug/g	75000	69000	70000	66000	81000	74000	70000	69000	73000	62000	63000	58000	82000	71000	72000	68000
Acid Extractable Chromium (Cr)	ug/g	26	27	30	25	26	28	36	48	78	110	13	12	25	26	30	32
Acid Extractable Cobalt (Co)	ug/g	8.3	8.7	9.3	8.9	8.8	9.4	13	17	17	15	5.4	5.3	9.2	9.1	9.9	11
Acid Extractable Copper (Cu)	ug/g	68	61	63	58	60	61	85	100	120	130	28	21	60	62	61	83
Acid Extractable Iron (Fe)	ug/g	21000	22000	23000	21000	23000	23000	23000	24000	23000	26000	14000	15000	24000	24000	25000	23000
Acid Extractable Lead (Pb)	ug/g	54	73	95	92	42	57	130	160	130	110	33	15	42	59	80	120
Acid Extractable Magnesium (Mg)	ug/g	19000	19000	17000	18000	20000	20000	17000	17000	16000	15000	8900	6500	18000	17000	16000	17000
Acid Extractable Manganese (Mn)	ug/g	610	610	640	590	670	610	640	670	670	650	400	470	660	660	750	700
Acid Extractable Molybdenum (Mo)	ug/g	1	0.77	0.69	0.66	1.1	0.99	0.92	0.85	0.75	0.97	<0.50	<0.50	1.4	0.99	0.63	0.86
Acid Extractable Nickel (Ni)	ug/g	22	24	28	25	22	24	34	58	59	53	11	12	22	24	28	30
Acid Extractable Phosphorus (P)	ug/g	1100	1300	1100	1100	960	1100	1400	1600	2000	1900	800	810	920	1100	1100	1400
Acid Extractable Potassium (K)	ug/g	1600	1700	1600	1300	1800	1700	1700	1800	1600	1900	840	1100	1800	1600	1800	1600
Acid Extractable Selenium (Se)	ug/g	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	0.62	0.63	<0.50	0.52	<0.50	<0.50	<0.50	0.53	0.55	0.54
Acid Extractable Silver (Ag)	ug/g	0.49	1.1	0.91	1.2	0.42	0.73	2.8	3.8	5.4	3.8	<0.20	<0.20	0.48	0.71	0.83	2.3
Acid Extractable Sodium (Na)	ug/g	300	270	250	240	320	300	290	260	260	330	210	220	350	270	220	230
Acid Extractable Strontium (Sr)	ug/g	160	130	140	120	200	170	140	130	110	94	130	120	240	160	160	130
Acid Extractable Thallium (Tl)	ug/g	0.16	0.16	0.15	0.13	0.2	0.18	0.17	0.17	0.19	0.22	0.15	0.094	0.22	0.19	0.17	0.17
Acid Extractable Tin (Sn)	ug/g	4.9	5	6	6.1	3.6	4.1	8.9	11	18	20	1.8	1.1	2.8	3.6	5.1	13
Acid Extractable Uranium (U)	ug/g	0.49	0.48	0.43	0.42	0.53	0.54	0.54	0.56	0.52	0.59	0.34	0.46	0.62	0.52	0.45	0.5
Acid Extractable Vanadium (V)	ug/g	21	22	22	19	22	23	23	25	24	26	16	18	22	23	24	22
Acid Extractable Zinc (Zn)	ug/g	310	290	310	280	330	320	450	520	600	810	160	70	330	310	310	370
Acid Extractable Mercury (Hg)	ug/g	0.21	0.62	0.3	0.35	0.16	0.15	0.38	0.37	0.68	0.56	<0.050	<0.050	0.19	0.32	0.22	0.37
PAHs																	
Acenaphthene	ug/g	<0.10	0.077	0.061	0.025	<0.10	<0.10	0.063	<0.10	0.1	0.16	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
Acenaphthylene	ug/g	<0.10	<0.050	<0.050	0.008	<0.10	<0.10	<0.050	<0.10	<0.050	<0.10	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
Anthracene	ug/g	0.12	0.15	<0.10	0.054	<0.10	<0.10	0.078	0.11	0.17	0.12	<0.050	<0.10	<0.10	0.019	<0.050	<0.050
Benzo(a)anthracene	ug/g	0.57	0.67	0.44	0.19	0.39	0.42	0.39	0.4	0.66	0.44	0.14	<0.10	0.34	0.092	0.16	0.11
Benzo(a)pyrene	ug/g	0.69	0.74	0.51	0.21	0.51	0.5	0.41	0.4	0.67	0.47	0.2	<0.10	0.44	0.11	0.19	0.12
Benzo(b,j)fluoranthene	ug/g	1.2	1.1	0.79	0.32	0.79	0.77	0.62	0.61	0.95	0.82	0.32	<0.10	0.7	0.19	0.31	0.19
Benzo(g,h,i)perylene	ug/g	0.62	0.6	0.43	0.19	0.46	0.42	0.34	0.32	0.51	0.36	0.18	<0.10	0.42	0.1	0.17	0.1
Benzo(k)fluoranthene	ug/g	0.4	0.39	0.26	0.11	0.28	0.27	0.22	0.2	0.34	0.24	0.11	<0.10	0.24	0.058	0.11	0.059
Chrysene	ug/g	0.75	0.75	0.53	0.22	0.47	0.5	0.44	0.43	0.68	0.46	0.21	<0.10	0.39	0.12	0.2	0.13
Dibenzo(a,h)anthracene	ug/g	0.11	0.12	0.078	0.042	<0.10	<0.10	0.06	<0.10	0.12	<0.10	<0.050	<0.10	<0.10	0.021	<0.050	<0.050
Fluoranthene	ug/g	1.9	2.1	1.4	0.6	1.3	1.3	1.3	1.2	1.6	1.1	0.55	<0.10	1.1	0.3	0.58	0.4
Fluorene	ug/g	<0.10	0.074	0.053	0.029	<0.10	<0.10	<0.050	<0.10	<0.090	0.11	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	ug/g	0.61	0.66	0.46	0.19	0.48	0.45	0.35	0.33	0.53	0.37	0.18	<0.10	0.42	0.1	0.16	0.09
Methylnaphthalene, 2-(1-)	ug/g	<0.14	<0.071	<0.071	0.011	<0.14	<0.14	<0.071	<0.14	0.081	<0.14	<0.071	<0.14	<0.14	<0.071	<0.071	<0.071
1-Methylnaphthalene	ug/g	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.050	<0.10	<0.050	<0.10	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
2-Methylnaphthalene	ug/g	<0.10	<0.050	<0.050	0.011	<0.10	<0.10	<0.050	<0.10	0.081	<0.10	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
Naphthalene	ug/g	<0.10	<0.050	<0.050	0.0094	<0.10	<0.10	<0.050	<0.10	0.056	<0.10	<0.050	<0.10	<0.10	<0.010	<0.050	<0.050
Phenanthrene	ug/g	0.62	0.93	0.62	0.27	0.31	0.37	0.58	0.67	0.9	0.58	0.22	<0.10	0.28	0.089	0.21	0.26
Pyrene	ug/g	1.4	1.6	1.1	0.48	1	1	1	0.99	1.3	0.98	0.41	<0.10	0.86	0.23	0.45	0.31
SIZE DISTRIBUTION																	
< -1 Phi (2 mm)	%					100	100	100	100	100	100						
< 0 Phi (1 mm)	%					100	100	100	100	100	100						
< +1 Phi (0.5 mm)	%					100	100	100	100	99	99						
< +2 Phi (0.25 mm)	%					99	99	99	99	99	99						
< +3 Phi (0.12 mm)	%																

Table A3. Cootes Paradise Sediment Sample Analytical Results - April 2021

Station	CP-C08								CP-REF-1				CP-REF-02			
Sample ID	CP-C07-60-75	CP-C08-0-15	CP-C08-15-30	CP-C08-30-45	CP-C08-45-60	CP-C08-60-75	CP-C08-75-90	CP-REF-1-0-15	CP-REF-1-15-30	CP-REF-1-30-45	CP-REF-1-45-60	CP-REF-2-0-15	CP-REF-2-15-30	CP-REF-2-30-45	CP-REF-2-45-60	
BV Labs Sample ID	PKV716	PKV697	PKV698	PKV699	PKV700	PKV701	PKV702	PKV703	PKV704	PKV705	PKV706	PKV707	PKV708	PKV709	PKV710	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Sampled By	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	
Sampling Date and Time	4/26/21 11:30	4/23/21 14:00	4/23/21 14:00	4/23/21 14:00	4/23/21 14:00	4/23/21 14:00	4/23/21 14:00	4/26/21 9:30	4/26/21 9:30	4/26/21 9:30	4/26/21 9:30	4/26/21 10:30	4/26/21 10:30	4/26/21 10:30	4/26/21 10:30	
Parameter Name	Units															
PHYSICAL																
Moisture	%	44	58	51	48	41	43	43	33	29	38	59	59	46	51	47
ANIONS & NUTRIENTS																
Total Ammonia-N	ug/g	349	56	143	218	257	326	365	36	<20	72	126	39	81	102	152
Nitrogen (N)	%	0.21	0.23	0.2	0.21	0.18	0.19	0.2	0.1	0.078	0.27	0.63	0.27	0.22	0.26	0.32
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	2100	2330	2000	2130	1850	1910	1990	1020	1850	2670	6320	2740	2210	2590	3210
Nitrite (N)	ug/g	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	ug/g	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrate + Nitrite (N)	ug/g	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																
Acid Extractable Aluminum (Al)	ug/g	14000	13000	13000	14000	13000	13000	14000	5200	5800	15000	15000	14000	15000	16000	21000
Acid Extractable Antimony (Sb)	ug/g	1.8	0.58	0.41	0.53	0.44	0.5	0.48	<0.20	<0.20	<0.20	<0.20	0.25	0.45	0.56	0.47
Acid Extractable Arsenic (As)	ug/g	8.4	5.1	6	6.4	6.3	6.1	6.7	2.7	2.8	6	8.1	4.9	5.9	7.2	6.9
Acid Extractable Barium (Ba)	ug/g	180	100	110	110	120	110	120	41	40	95	120	110	110	120	130
Acid Extractable Beryllium (Be)	ug/g	0.64	0.56	0.62	0.6	0.63	0.58	0.64	0.29	0.28	0.66	0.65	0.66	0.66	0.69	0.88
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Boron (B)	ug/g	45	16	15	24	27	31	34	<5.0	<5.0	6.2	6.1	8.2	11	12	15
Acid Extractable Cadmium (Cd)	ug/g	12	1.1	1.3	1.4	1.4	1.5	1.8	0.19	0.25	0.34	0.35	0.7	1.3	2.5	1.7
Acid Extractable Calcium (Ca)	ug/g	69000	83000	84000	78000	74000	70000	72000	60000	55000	44000	16000	96000	82000	70000	48000
Acid Extractable Chromium (Cr)	ug/g	46	27	29	30	31	30	33	10	11	22	21	24	28	33	41
Acid Extractable Cobalt (Co)	ug/g	16	9.6	9.8	10	10	10	11	5	5.2	11	11	10	11	12	13
Acid Extractable Copper (Cu)	ug/g	87	62	60	69	68	62	69	20	20	39	39	41	48	53	44
Acid Extractable Iron (Fe)	ug/g	27000	25000	26000	27000	27000	27000	26000	14000	14000	25000	25000	27000	29000	30000	33000
Acid Extractable Lead (Pb)	ug/g	150	44	47	60	66	86	92	13	15	32	27	33	51	69	68
Acid Extractable Magnesium (Mg)	ug/g	15000	17000	15000	16000	16000	15000	14000	11000	11000	13000	10000	11000	12000	12000	10000
Acid Extractable Manganese (Mn)	ug/g	750	700	770	830	770	790	830	490	430	810	410	870	780	720	630
Acid Extractable Molybdenum (Mo)	ug/g	0.85	1.3	0.94	0.91	0.84	0.9	0.68	<0.50	<0.50	0.57	0.68	0.8	0.72	0.74	0.77
Acid Extractable Nickel (Ni)	ug/g	48	23	25	27	28	29	31	10	12	25	26	25	30	38	38
Acid Extractable Phosphorus (P)	ug/g	1700	940	950	1200	1200	1200	840	770	770	890	870	890	940	1100	1000
Acid Extractable Potassium (K)	ug/g	1900	1900	1900	2100	2100	1800	1900	780	760	1800	1600	2200	2000	2100	2800
Acid Extractable Selenium (Se)	ug/g	0.81	<0.50	0.51	0.6	0.63	0.65	0.63	<0.50	<0.50	<0.50	<0.50	<0.50	0.72	0.74	0.65
Acid Extractable Silver (Ag)	ug/g	3.4	0.37	0.42	0.58	0.69	0.89	1.2	<0.20	<0.20	<0.20	<0.20	<0.20	0.44	0.75	0.35
Acid Extractable Sodium (Na)	ug/g	240	390	290	310	260	260	240	150	120	170	180	270	250	270	240
Acid Extractable Strontium (Sr)	ug/g	160	260	240	200	170	160	150	130	96	81	43	350	230	160	110
Acid Extractable Thallium (Tl)	ug/g	0.25	0.23	0.21	0.25	0.21	0.2	0.21	0.16	0.11	0.14	0.14	0.22	0.25	0.28	0.28
Acid Extractable Tin (Sn)	ug/g	8.4	2.7	2.9	3.5	4.2	5	6.4	<1.0	1.1	1.4	<1.0	1.8	3.2	3.9	3.3
Acid Extractable Uranium (U)	ug/g	0.55	0.64	0.52	0.58	0.47	0.48	0.45	0.34	0.33	0.55	0.78	0.54	0.56	0.59	0.78
Acid Extractable Vanadium (V)	ug/g	26	24	25	26	27	25	26	15	15	28	28	25	28	29	34
Acid Extractable Zinc (Zn)	ug/g	520	340	350	370	340	330	350	110	94	220	270	250	280	320	210
Acid Extractable Mercury (Hg)	ug/g	0.34	0.11	0.12	0.19	0.21	0.35	0.25	<0.050	<0.050	<0.050	<0.050	<0.050	0.12	0.13	0.096
PAHs																
Acenaphthene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)anthracene	ug/g	0.32	0.31	0.29	0.35	0.34	0.29	0.33	<0.050	0.054	<0.050	<0.20	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	ug/g	0.35	0.43	0.39	0.45	0.41	0.39	0.38	<0.050	0.059	0.054	<0.10	<0.10	0.1	0.1	<0.10
Benzo(b,j)fluoranthene	ug/g	0.5	0.69	0.61	0.72	0.74	0.57	0.65	0.081	0.1	0.079	<0.10	0.16	0.21	0.19	0.17
Benzo(g,h,i)perylene	ug/g	0.29	0.42	0.36	0.41	0.31	0.26	0.27	<0.050	<0.050	0.068	<0.10	<0.10	<0.10	<0.10	0.12
Benzo(k)fluoranthene	ug/g	0.18	0.22	0.21	0.25	0.25	0.19	0.2	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	ug/g	0.35	0.38	0.36	0.45	0.41	0.34	0.37	0.059	0.064	<0.050	<0.10	<0.10	0.11	<0.10	<0.10
Dibenzo(a,h)anthracene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	ug/g	0.95	1.1	0.9	1.1	1	0.86	0.97	0.12	0.11	<0.050	<0.10	0.16	0.17	0.19	0.16
Fluorene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Indeno(1,2,3-cd)pyrene	ug/g	0.3	0.41	0.37	0.43	0.37	0.33	0.27	<0.050	<0.050	0.051	<0.10	<0.10	<0.10	<0.10	0.12
Methylnaphthalene, 2-(1-)	ug/g	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.071	<0.071	<0.071	<0.14	<0.14	<0.14	<0.14	<0.14
1-Methylnaphthalene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Naphthalene	ug/g	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	ug/g	0.48	0.24	0.33	0.33	0.36	0.33	0.33	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10
Pyrene	ug/g	0.76	0.84	0.73	0.89	0.8	0.66	0.75	0.094	0.094	<0.050	<0.10	0.14	0.15	0.16	0.15
SIZE DISTRIBUTION																
< -1 Phi (2 mm)	%		100		100		100									
< 0 Phi (1 mm)	%		100		100		100									
< +1 Phi (0.5 mm)	%		100		100		100									
< +2 Phi (0.25 mm)	%		100		99		100									
< +3 Phi (0.12 mm)	%		99		99		99									
< +4 Phi (0.062 mm)	%		97		98		99									
< +5 Phi (0.031 mm)	%		84		89		88									
< +6 Phi (0.016 mm)	%		67		70		71									
< +7 Phi (0.0078 mm)	%		22		39		39									

Table A3. Cootes Paradise Sediment Sample Analytical Results - April 2021

	Station	
	Sample ID	CP-REF-2-60-75
	BV Labs Sample ID	PKV711
	Matrix	Solid
	Sampled By	TB
	Sampling Date and Time	4/26/21 11:30
Parameter Name	Units	
PHYSICAL		
Moisture	%	44
ANIONS & NUTRIENTS		
Total Ammonia-N	ug/g	210
Nitrogen (N)	%	0.3
Calculated Total Kjeldahl Nitrogen (TKN)	ug/g	2960
Nitrite (N)	ug/g	<0.5
Nitrate (N)	ug/g	<2
Nitrate + Nitrite (N)	ug/g	<3
METALS		
Acid Extractable Aluminum (Al)	ug/g	25000
Acid Extractable Antimony (Sb)	ug/g	<0.20
Acid Extractable Arsenic (As)	ug/g	4.6
Acid Extractable Barium (Ba)	ug/g	190
Acid Extractable Beryllium (Be)	ug/g	1.1
Acid Extractable Bismuth (Bi)	ug/g	<1.0
Acid Extractable Boron (B)	ug/g	7.4
Acid Extractable Cadmium (Cd)	ug/g	0.19
Acid Extractable Calcium (Ca)	ug/g	22000
Acid Extractable Chromium (Cr)	ug/g	32
Acid Extractable Cobalt (Co)	ug/g	13
Acid Extractable Copper (Cu)	ug/g	31
Acid Extractable Iron (Fe)	ug/g	36000
Acid Extractable Lead (Pb)	ug/g	15
Acid Extractable Magnesium (Mg)	ug/g	9000
Acid Extractable Manganese (Mn)	ug/g	480
Acid Extractable Molybdenum (Mo)	ug/g	0.77
Acid Extractable Nickel (Ni)	ug/g	34
Acid Extractable Phosphorus (P)	ug/g	800
Acid Extractable Potassium (K)	ug/g	2900
Acid Extractable Selenium (Se)	ug/g	<0.50
Acid Extractable Silver (Ag)	ug/g	<0.20
Acid Extractable Sodium (Na)	ug/g	210
Acid Extractable Strontium (Sr)	ug/g	67
Acid Extractable Thallium (Tl)	ug/g	0.2
Acid Extractable Tin (Sn)	ug/g	<1.0
Acid Extractable Uranium (U)	ug/g	0.88
Acid Extractable Vanadium (V)	ug/g	39
Acid Extractable Zinc (Zn)	ug/g	98
Acid Extractable Mercury (Hg)	ug/g	<0.050
PAHs		
Acenaphthene	ug/g	<0.10
Acenaphthylene	ug/g	<0.10
Anthracene	ug/g	<0.10
Benzo(a)anthracene	ug/g	<0.10
Benzo(a)pyrene	ug/g	<0.10
Benzo(b,j)fluoranthene	ug/g	<0.10
Benzo(g,h,i)perylene	ug/g	<0.10
Benzo(k)fluoranthene	ug/g	<0.10
Chrysene	ug/g	<0.10
Dibenzo(a,h)anthracene	ug/g	<0.10
Fluoranthene	ug/g	<0.10
Fluorene	ug/g	<0.10
Indeno(1,2,3-cd)pyrene	ug/g	<0.10
Methylnaphthalene, 2-(1-)	ug/g	<0.14
1-Methylnaphthalene	ug/g	<0.10
2-Methylnaphthalene	ug/g	<0.10
Naphthalene	ug/g	<0.10
Phenanthrene	ug/g	<0.10
Pyrene	ug/g	<0.10
SIZE DISTRIBUTION		
< -1 Phi (2 mm)	%	
< 0 Phi (1 mm)	%	
< +1 Phi (0.5 mm)	%	
< +2 Phi (0.25 mm)	%	
< +3 Phi (0.12 mm)	%	
< +4 Phi (0.062 mm)	%	
< +5 Phi (0.031 mm)	%	
< +6 Phi (0.016 mm)	%	
< +7 Phi (0.0078 mm)	%	
< +8 Phi (0.0039 mm)	%	
< +9 Phi (0.0020 mm)	%	
Gravel	%	
Coarse Sand	%	
Fine Sand	%	
Silt	%	
Clay	%	
Loss on Ignition	%w/w	
Wet Bulk Density	g/cm3	
Liquid Limit	%w/w	
Plastic Limit	%w/w	
Plasticity Index	%w/w	
Dissolved BOD5	mg/L	

Appendix B

Sediment Analysis Results Tables – August 2021

