



2023

City of Peterborough Stormwater Asset Operations Report ECA# 145-S701



April 30th, 2024

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Introduction

1.0 Stormwater Management Facilities

Stormwater management facilities such as stormwater management ponds act as flood reduction control and filtration facilities for urban runoff. When rain falls and flows overland sediment and pollutants from automobiles, fertilizers, organics etc. are transported into the City's storm sewer infrastructure and outlet into natural watercourses. To ensure that these pollutants do not end up in natural watercourses damaging the natural environment as well as impacting our drinking water source, Stormwater Management Facilities (SWMF) are installed. Many of these SWMF's are constructed as settling ponds. These ponds are designed to allow sediments time to settle to the bottom and trap pollutants within the facility. A SWMF can also retain heavy metals that bind to sediments, and remove excessive nutrients through biological and physical processes. These facilities are also designed to temporarily store stormwater runoff to reduce the risk of flooding and downstream erosion during heavy rain events. There are two primary types of ponds within Peterborough "Wet Ponds" and "Dry Ponds". Variations to these two types of facilities also exist, such as hybrid wetland/wet ponds.

A **wet pond** is a detention basin designed to temporarily store collected stormwater runoff and release it at a controlled rate. These ponds are considered "wet" because they maintain a permanent pool elevation meaning there is a constant level of water in them at all times. Wet ponds provide water quality control and flood control.

A **dry pond** is a detention basin designed to temporarily store collected stormwater runoff and release it at a controlled rate through an outlet. These ponds often resemble low areas in park lands or open grassed spaces that typically remain dry as they do not hold water unless there is a major rain event. Dry ponds are primarily for flood control only but may provide some passive water quality benefits.

Where there is not enough land for a Stormwater Management Pond to be constructed, such as in a road right of way, underground structures known as **Oil and Grit Separators (OGS)** are introduced into the storm sewer system to act as a settling basin for sediment and separation device for oils. These structures resemble large maintenance holes; however, they are designed to capture and retain sediment and pollutants during frequent rainfall events.

Recent advancements in Stormwater Management technologies involve mimicking naturalized features that slow and infiltrate stormwater closer to the source rather than at the end of a pipe. These features referred to as **Low Impact Development (LID)** stormwater management features come in a variety of types including bioretention facilities, infiltration chambers, planter boxes, permeable hardscape surfaces etc.

I.1 Reporting Requirements

This report has been prepared to meet the requirements of the City of Peterborough's Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) issued by the Ministry of Climate Change and Parks (MECP).

The report will outline the following:

- The overall annual inspection and maintenance program for the Stormwater Management System for 2023 outlining overall performance and the maintenance needs at each facility.
- A summary of operating problems and any complaints related to the stormwater management system and steps taken to address these problems/complaints as well as a summary of all spills or abnormal discharge events.
- A description and summary of Alterations to the Authorized System that occurred in 2023 including a list of alterations that pose a significant drinking water threat.
- Summaries of corrective actions taken to improve or correct the performance of the Stormwater Management System and status updates of required corrective actions from the previous reporting years.

Note: Monitoring requirements and a summary of results will be included in subsequent versions of this report as the required guidelines become available from the MECP.

Inspection and Maintenance Program

2.0 – End of Pipe (Pond) Inspection and Maintenance Program

There are various considerations to be made concerning maintenance requirements related to overall pond performance. The primary maintenance concern related to a stormwater management pond function is the amount of accumulated sediment within the facility. The City of Peterborough conducts sediment surveys of wet facilities on a 3-year cycle.

Tables outlining the findings of each sediment survey are included in the individual pond inspection summaries in Section 2.2 of this report.

The following criteria and indicators are included in each table:

- The **MECP Volume** is the volume required for a facility's specific level of TSS removal.
- The **Maintenance Trigger Volume** is when the facility reaches 5% less efficiency for its specific level of TSS removal.
- The **Forebay Depth Capacity** was calculated by dividing the depth in the survey data table by its corresponding design depth in the design information table. This means that any depth smaller than its design depth will result in a percentage less than 100%. If it falls below 60%, but greater or equal to 40% a yellow circle is shown, a red circle indicates anything below 40% depth capacity.
- The **Facility Volume Capacity (Maintenance)** was calculated by dividing the 2021 Volume by the maintenance trigger volume. This means any facility with a volume below the maintenance trigger requirements will have a percentage less than 100% and result in a red circle (indicating maintenance required). Yellow is for anything greater than or equal to 100% and less than 110% (indicating maintenance is required soon). If the percentage is greater than or equal to 110% a green circle is shown.
- The **Facility Volume Capacity (Design)** was calculated by dividing the 2021 Volume by the Design Permanent Pool Volume. This means any facility with a volume below the design volume requirements will have a percentage less than 100% and result in a red circle. A yellow circle is for anything greater than or equal to 100% and less than 110%. If the percentage is greater than or equal to 110% a green circle is shown.

The maintenance requirements are based on a facility's percent efficiency to provide water quality assurance to a predetermined level. These protection levels include:

- **80% Level 1 – Enhanced**
- **70% Level 2 – Normal**
- **60% Level 3 – Basic**

The following table is used to determine the minimum required permanent pool volume (current capacity) of each facility (less 40m³/ha for extended detention volume). A facility fails to meet the

required storage volume when its efficiency drops below 5% of its original value (referred to as the Maintenance Trigger Volume) in which case the facility may need to be cleaned out. These maintenance volumes are related to how much storage a pond requires to maintain a specific “Total Suspended Solid” (TSS) removal rate

Table 1: Water Quality Storage Requirements – Modified from Stormwater Management Planning and Design Manual

Water Quality Storage Requirements For Wet SWM Ponds				
	Storage Volume (m³/ha) for Impervious Level			
Protection Level	35%	55%	70%	85%
Enhanced - 80%	140	190	225	250
75% (Trigger Volume)	115	150	177.5	200
Normal - 70%	90	110	130	150
Basic - 60%	60	75	85	95

Though sediment accumulation is the primary driver of maintenance operations other factors that significantly impede the facility's ability to perform effectively may trigger a maintenance operation and should be considered on a case-by-case basis.

Maintenance operations typically involve physically dredging accumulated sediment out of a facility, thereby increasing storage back to its design capacity.

2.1 – Wet Pond Maintenance Requirements

All assumed wet ponds were visually inspected in 2023 using the City of Peterborough’s Inspection and Maintenance GIS application. Summaries of these findings can be found in Section 2.2 of this report.

Facilities requiring clean-out based on the 2021 sediment surveys as determined by MECP guidelines are summarized in Table 2 below. The table also includes a summary of facilities which may require a cleanout due to their volume dropping below the original design volume or having a forebay depth less than the acceptable standard. Individual facility data recommendations are provided in Section 2.2 “Wet Pond Summaries” and sediment drawings for each pond are provided in Appendix A.

Table 2: Summarized Sediment Survey Potential Cleanout Conditions

Maintenance Volume Conditions - FULL POND			Design Volume Capacity - FULL POND			Maintenance Volume Conditions - FOREBAY		
Facility ID	SWM Facility	Type	Facility ID	SWM Facility	Type	Facility ID	SWM Facility	Type
1	Water Street	Wet	1	Water Street	Wet	1	Water Street	Wet
2	Heritage Park	Wet	2	Heritage Park	Wet	2	Heritage Park	Wet
3	Cunningham	Wet	3	Cunningham	Wet	3	Cunningham	Wet
4	Eldon Court	Wet	4	Eldon Court	Wet	4	Eldon Court	Wet
5	Summerhill	Wet	5	Summerhill	Wet	5	Summerhill	Wet
6	Towerhill North	Wet	6	Towerhill North	Wet	6	Towerhill North	Wet
9	Chemong Park Plaza	Wet	9	Chemong Park Plaza	Wet	9	Chemong Park Plaza	Wet
10	Towerhill South	Wet	10	Towerhill South	Wet	10	Towerhill South	Wet
15	Foxmeadow	Wet	15	Foxmeadow	Wet	15	Foxmeadow	Wet
16	Meadows	Wet	16	Meadows	Wet	16	Meadows	Wet
17	Fairview Estates	Wet	17	Fairview Estates	Wet	17	Fairview Estates	Wet
18	Loggerhead 2	Wet	18	Loggerhead 2	Wet	18	Loggerhead 2	Wet
19	Loggerhead 1	Wet	19	Loggerhead 1	Wet	19	Loggerhead 1	Wet
21	Cedargrove	Wet	21	Cedargrove	Wet	21	Cedargrove	Wet
23	Wentworth	Wet	23	Wentworth	Wet	23	Wentworth	Wet
27	College Park	Wet	27	College Park	Wet	27	College Park	Wet
29	Major Bennett	Wet	29	Major Bennett	Wet	29	Major Bennett	Wet

Sediment Loading Analysis

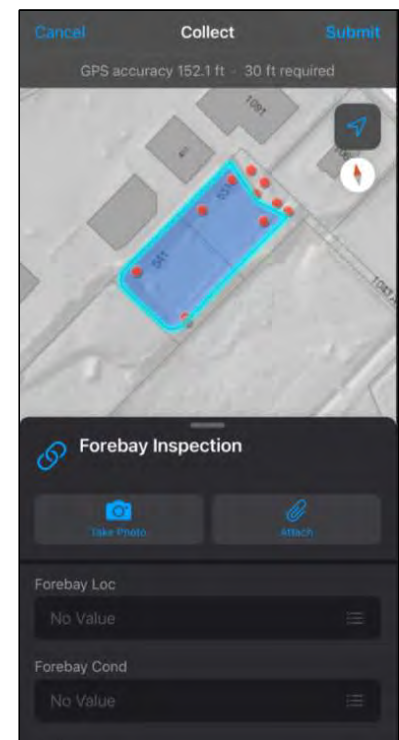
More data is needed to accurately determine sediment loading rates at each facility. This information will become available as additional sediment surveys are conducted and analyzed.

2.2 - Wet Pond Annual Inspections/Summaries

City staff use an integrated GIS application to conduct annual Stormwater Management Pond inspections. The app provides a standardized question/comment list for inspectors to reference and work through while conducting their visual inspection in the field. This ensures that consistent records are maintained and that all the required information is captured.

In addition, inspectors can place pins to identify specific maintenance tasks. These pins provide the general geographic location for items to be corrected as well as a brief description of the task. These pins populate a task list to be referred to by the City's Public Works department or a sub-contractor completing the maintenance operations. As each task is completed it is marked as "complete" in the application to make sure no items are missed.

A summary of each pond inspection has been provided in the section below, detailed inspection information can be viewed within the Inspection application upon request.



Pond Admin App													
<div> <div> <div>+</div> <div>-</div> <div>📍</div> <div>🏠</div> <div>🕒</div> <div>📄</div> </div> <div>Search Location/Facility/ID/</div> <div>🔍</div> </div> <div> <div>📏 100m</div> <div>2,337,067.603 16,112,166.464 Feet</div> </div>													
<div> <div>Pond Inspection Point Defect</div> <div>Storm Detention Pond</div> <div>Pond Inspection</div> <div>Pond Inspect Forebay</div> <div>Pond Inspect Outlet</div> </div> <div> <div>Options</div> <div>Filter by map extent</div> <div>Zoom to</div> <div>Clear selection</div> <div>Refresh</div> </div>													
Est Survey Sediment Vol	Sediment Removal Req	Water Level	Rain in Last 2 Days	Resident Complaints	Pond Type	Water Appearance	Inlet Water Temp	Outlet Water Temp	Odour Present	Sheen Visible	Fish Visible	Excess Algae Growth	Water Comments
		Normal	Yes		Wet	Murky			Yes	Yes	No	No	Water is cloudy has a lot of debris and vegetation floating in it a lot of vegetation around the edges as well
		Normal	Yes		Wet	Clear			No	Yes	Yes	No	Water appears to be clear but has a bunch of vegetation debris floating in it
		Normal	Yes		Wet	Clear			No	No	No	No	Water appears to be in generally good condition

Water Street Pond #302989

Inspection Summary 05/04/23:

The weather was cloudy. The water level is normal. The water was clear. Trees were downed around the pond due to a beaver activity. Some algae growth in the pond. Inlets have structural damage but are still functional. Slight blockage of the outfall restricting outlet. Fence repair is required due to a fallen tree.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.1 below.



Table A-1.1: Water Street Pond 2021 Sediment Survey Data

Pond Survey Data (2021)		Design Information	
As-built Permanent Pool Volume (m3)	4994	Treatment Level	Level 1 "Enhanced"
Sediment Volume (m3)	313	Service Area % Impervious	37.7
Remaining Storage Volume (m3)	4681	Service Area (ha)	51.4
Observed Permanent Pool Elevation	207.6	Design Permanent Pool Volume (m3)	5652
Main Cell Top of Sediment	206.25	Design Permanent Pool Elevation	208.2
Main Cell Depth	1.35	Required PP Volume (m3)	5507
Forebay Top of Sediment Elevation	207	Maintenance Trigger Volume (m3)	3943
Average Surveyed Forebay Depth	0.6	Pond Bottom Elevation	206.1
		Forebay Depth	2.1
		Permanent Pool Elevation	208.2
		Forebay Depth Capacity	● 28.57%
		Pond Volume Capacity (Maintenance)	● 118.72%
		Pond Volume Capacity (Design)	● 82.82%

Maintenance Recommendations/Actions:

The Water Street Pond is in fair condition. The 2021 sediment survey concluded the capacity of this facility is above the minimum MECP maintenance trigger volume, and the facility is only 22% below its original design capacity. No major sediment removal is required currently. However, the forebay should be considered for a clean-out when feasible.

There are many trees down that could be removed and there is a blockage in the outfall that should be cleared out. Fence damage that needs to be repaired. Most importantly, the inlet structure is severely damaged and should be repaired as soon as possible.

Heritage Park Pond #168948

Inspection Summary 05/04/23:

Light Rain During Inspection. Water appearance was cloudy. Sediment and aquatic vegetation overgrowth in front of north inlet. Culvert causing erosion on west side of pond. Annual complaints of odour from facility in the summer months.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.2 below.



Table A-1.2: Heritage Park Pond 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
As-built Pond Permanent Pool Volume (m3)	14135	Treatment Level	Level 1 "Enhanced"
Sediment Volume (m3)	1113	Service Area % Impervious	34.5
Storage Volume (m3)	13022	Service Area (ha)	56.1
Observed Permanent Pool Elevation	220.86	Permanent Pool Volume (m3)	12315
North Forebay Top of Sediment	218.6	Required PP Volume (m3)	5510
North Forebay Depth	2.26	Maintenance Trigger Volume (m3)	4006
South Forebay Top of Sediment	218.8	Pond Bottom Elevation	218.5
South Forebay Depth	2.06	Pond Depth	2.56
Main Cell Top of Sediment	217.8	North Forebay Bottom	218.64
Main Cell Depth	3.06	North Forebay Depth	2.42
		South Forebay Bottom	218.88
		South Forebay Depth	2.18
		Permanent Pool Elevation	221
		North Forebay Depth Capacity	● 93.39%
		South Forebay Depth Capacity	● 94.50%
		Pond Volume Capacity (Maintenance)	● 325.06%
		Pond Volume Capacity (Design)	● 105.74%

Maintenance Recommendations/Actions:

The Heritage Park Pond is in fair condition overall, both facility forebays were cleaned out in 2017 by the developer. The current capacity per the 2021 sediment survey of this facility is well above maintenance and design capacity indicating this pond was built deeper than design. No major sediment removal is required currently.

Vegetation overgrowth should be cleared from the inlets to the facility as soon as possible. There is an improperly constructed overland flow weir that needs to be corrected that was identified prior to releasing securities to the developer. The developer has made payment to the City to an agreed upon amount to correct this issue.

Cunningham Pond #260500

Inspection Summary 05/05/23:

Weather Sunny rain within the last 2 days.
Water is clear. Vegetation overgrowth in forebays and outlet. The southern inlet and forebay is in good condition, the eastern inlet is fully engulfed in aquatic vegetation. Dead vegetation clogging outlet restricting flows. General litter around the pond.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.3 below.



Table A-1.3: Cunningham Pond 2021 Sediment Survey Data

2021 Pond Survey Data/2023 Cleanout Data		Design Information	
As-built Pond Bottom Volume (m3)	2828	Treatment Level	Level 1 "Enhanced"
Sediment Volume (m3)	404	Service Area % Impervious	45
Storage Volume (m3)	2424	Service Area (ha)	26.22
2023 Forebay Cleanout Volume (m3)	226	Design Permanent Pool Volume (m3)	3399
2023 Storage Volume (m3)	2650	Required PP Volume (m3)	3278
Observed Permanent Pool Elevation	208.5	Maintenance Trigger Volume (m3)	2342.4
East Forebay Top of Sediment	207.3	Permanent Pool Elevation	208.6
East Forebay Depth	1.2	Design Bottom	207.6
South Forebay Top of Sediment	207.45	Pond Depth	1
South Forebay Depth	1.05	East Forebay Bottom	207.6
Main Cell Top of Sediment	207.5	East Forebay Depth	1
Main Cell Depth	1	South Forebay Bottom	207.6
		South Forebay Depth	1
		East Forebay Depth Capacity	● 120.00%
		South Forebay Depth Capacity	● 105.00%
		Pond Volume Capacity (Maintenance)	● 113.13%
		Pond Volume Capacity (Design)	● 77.96%

2023 Maintenance Summary:

The Cunningham facility had both forebays cleaned out in 2023. In total, roughly 226m3 of sediment was removed from both forebays along with all vegetated overgrowth. Forebay berms were reinstated, lines flushed, and trees were planted as part of these maintenance operations.

Towerhill North Pond #190906

Inspection Summary (05/03/23):

Weather cloudy, slight rain. Water clear. Damage to the inlet. Headwall structure leading to the outfall clogged with vegetation growth restricting flow. Heavy invasive plant presence. General trash and debris around facility. Trees that still have collars. Outlet outfall is submerged and creating bubbling pool of water, requires rip-rap top up.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.4 below.



Table A-1.4: Towerhill North 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
As-built Pond Bottom Volume (m3)	9517	Treatment Level	Level 2 "Normal"
Sediment Volume (m3)	1106	Service Area % Impervious	42
Storage Volume (m3)	8411	Service Area (ha)	53.5
Observed Permanent Pool Elevation	227.5	Permanent Pool Volume (m3)	8500
Forebay Top of Sediment	226	Required PP Volume (m3)	3049
Forebay Depth	1.5	Maintenance Trigger Volume (m3)	1981
Main Cell top of Sediment	225.8	Pond Bottom Elevation	225.9
Main Cell Depth	1.7	Pond Depth	1.4
		Forebay Bottom	225.9
		Forebay Depth	1.4
		Permanent Pool Elevation	227.3
		Forebay Depth Capacity	107.14%
		Pond Volume Capacity (Maintenance)	424.58%
		Pond Volume Capacity (Design)	98.95%

Maintenance Recommendations/Actions:

The Towerhill North Pond is in fair condition overall. The 2021 survey capacity of this facility is above the minimum MECP maintenance trigger volume, and the facility is also above its original design capacity. No major sediment removal is required currently. The 2021 survey indicated that the forebay is slightly deeper than its design depth.

The outlet structure of this facility is prone to clogging. A redesign of the outlet structure is recommended when major maintenance operations on this facility are conducted. The grate on the inlet is missing bolts; this has left an opening into the storm drain. Phragmites make up most of the aquatic plants at the facility. Removal of these invasives is recommended.

Chemong Park Plaza Pond #168949

Inspection Summary 05/05/23:

Weather Cloudy, rain in last 48 hours. Water is murky, has foul odour and sheen is visible. Aquatic vegetation is overgrown. Downed fence on north side of facility. Lots of garbage and debris throughout facility. Damaged inlet headwall. Outlet grate covered in debris. Sediment accumulation at inlet and outlet. Heavy invasive phragmite presence within facility.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.5 below.

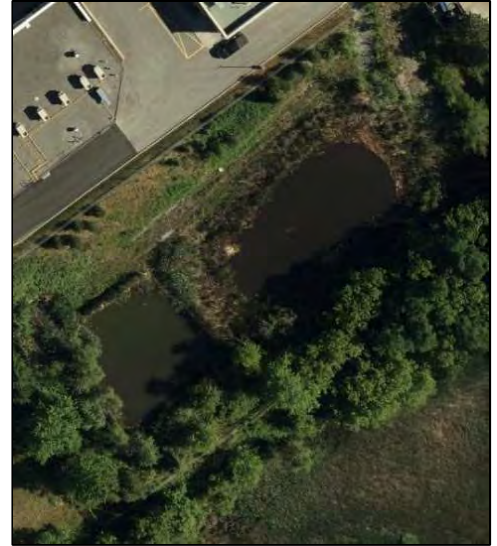


Table A-1.5: Chemong Park Plaza 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
2021 As-built Volume (m3)	2215	Treatment Level	Level 2 "Normal"
2021 Sediment Volume (m3)	376	Service Area % Impervious	51
2021 Storage Volume (m3)	1839	Service Area (ha)	10.9
Observed Permanent Pool Elevation	249.26	Permanent Pool Volume (m3)	845
Forebay Top of Sediment	248	Required PP Volume (m3)	763
Forebay Depth	1.26	Maintenance Trigger Volume (m3)	385
Maincell Top of Sediment	247.9	Pond Bottom Elevation	247.75
Pond Depth	1.36	Pond Depth	1.4
		Forebay Bottom	247.75
		Forebay Depth	1.4
		Permanent Pool Elevation	249.15
		Forebay Depth Capacity	● 90.00%
		Pond Volume Capacity (Maintenance)	● 477.66%
		Pond Volume Capacity (Design)	● 217.63%

Maintenance Recommendations/Actions:

Chemong Park Plaza Pond is in fair condition overall. The 2021 sediment survey capacity is above the minimum MECP maintenance trigger volume, and the facility is also above its original design capacity. The survey also indicated that the forebay of this facility was built much deeper than design.

The water in the pond has a foul odor, especially at the Inlet. Water quality tests have been done to better understand the issue however there is no definitive source assumption is that it may be due to restaurant grease leaking, further investigation is required. The excessive amounts of trash around the pond should be removed. A large section of the fence is down and should be repaired. Damaged structures should be repaired. Removal of the invasive phragmites and accumulated sediment at inlets and outlets is also recommended.

Towerhill South Pond #190907

Inspection Summary 05/03/23:

Weather cloudy with slight rain. Water appeared to be murky, and sheen was visible in the pond. Garbage around the pond. Missing warning sign indicating storm water management pond. Debris in the inlet, grate is open. Outfall from the outlet is covered in aquatic vegetation restricting flow. Sticks in the outlet structure. Heavy Invasive phragmite presence.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.6 below.



Table A-1.6: Towerhill South Pond 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
2021 As-built Volume (m3)	4122	MOECP Level	Level 2 "Normal"
2021 Sediment Volume (m3)	1106	Service Area % Impervious	61
2021 Storage Volume (m3)	3016	Service Area (ha)	16.9
Observed Permanent Pool Elevation	227.18	Permanent Pool Elevation	227.1
Forebay Top of Sediment	225.9	Permanent Pool Volume (m3)	4000
Forebay Depth	1.28	Required PP Volume (m3)	1195
Main cell Top of Sediment	225.4	Maintenance Trigger Volume (m3)	882
Main cell Depth	1.78	Pond Bottom Elevation	225.75
		Pond Depth	1.35
		Forebay Bottom Elevation	225.75
		Forebay Depth	1.35
		Forebay Depth Capacity	● 94.81%
		Pond Volume Capacity (Maintenance)	● 341.95%
		Pond Volume Capacity (Design)	● 75.40%

Maintenance Recommendations/Actions:

Overall, given the recent maintenance operations (2019) the Towerhill South Pond appears to be functioning well. Complaints from residents have been addressed and the pond has been re-instated to MECP volumes.

However, the phragmites which were recently removed have already returned to the pond. An estimated 60% of all aquatic plant species is phragmites. A more robust treatment should be considered to preserve the pond's biodiversity. The outlet is overgrown with the invasives, which could cause blockages. The inlet structure's trash rack is missing some bolts and requires repair. The hickenbottom has some debris in it which should be removed. A safety sign is missing and should be installed at the site.

Foxmeadow Pond #260464

Inspection Summary 05/05/23:

Weather was cloudy, rain within the last 2 days of the inspection. Water clear with some sheen, level appeared high. Dead aquatic overgrowth within pond. Trash and debris throughout. Vegetation and sediment clogging outlet structure. Minor erosion at the headwalls. Complaints about high water level.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.7 below.



Table A-1.7: Foxmeadow Pond 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
2021 Surveyed As-built Volume (m3)	581	Treatment Level	Level 2 "Normal"
2021 Sediment Volume (m3)	78	Service Area % Impervious	45
2021 Surveyed As-built Volume (m3)	503	Service Area (ha)	7.42
Observed Permanent Pool	193.7	Design Permanent Pool Volume (m3)	557
Forebay Top of Sediment	192.7	Permanent Pool Elevation	193.5
Forebay Depth	1	Required PP Volume (m3)	445
Main cell Top of Sediment	192.45	Maintenance Trigger Volume (m3)	290
Main Cell Depth	1.25	Main cell Bottom Elevation	192.5
		Main cell Depth	1
		Forebay Bottom	192.5
		Forebay Depth	1
		Forebay Depth Capacity	● 100%
		Pond Volume Capacity (Maintenance)	● 173%
		Pond Volume Capacity (Design)	● 90%

Maintenance Recommendations/Actions:

Foxmeadow is in good condition overall, the pond was cleaned out in Fall 2018. The 2021 survey of this pond indicates it is above both MECP and design volumes. The forebay remains just below design depth.

The facility, outlet and outfall channel should be cleared of excessive vegetation/trash and debris as soon as possible to ensure that there is not blockage of the structure during heavy rainfall.

Meadows Pond #302517

Inspection Summary 05/08/23:

Weather sunny, rain within 48 hours. Water level normal and clear appearance. Inlet pipe headwall have been separated. There is some build up of debris in the outfall which could pose a problem if there was significant rainfall. The outlet has blockages that need to be removed. A beaver dam is constructed in the outlet manhole each year requiring annual removal.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.8 below.



Table A-1.8: Meadows Pond 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
As-built Volume (m3)	2300	MECP Treatment Level	Level 2 "Normal"
Sediment Volume (m3)	336	Service Area % Impervious	34
Storage (m3)	1964	Service Area (ha)	6.1
Observed Permanent Pool Elevation	192.96	Design Permanent Pool Volume (m3)	310
Forebay Top of Sediment	191.8	Required PP Volume (m3)	245
Forebay Depth	1.16	Permanent Pool Elevation	192.9
Main Cell Top of Sediment	191.95	Maintenance Trigger Volume (m3)	642
Main Cell Depth	1.01	Main Cell Bottom Elevation	192.65
		Main Cell Depth	0.25
		Forebay Bottom	192.65
		Forebay Depth	0.25
		Forebay Depth Capacity	● 464.00%
		Pond Volume Capacity (Maintenance)	● 305.92%
		Pond Volume Capacity (MOECP 70%)	● 801.63%

Maintenance Recommendations/Actions:

The Meadows Stormwater Management Facility was fully dredged in 2020.

The 2021 sediment survey indicated that this facility was built with much more storage volume than required for "Normal" treatment level. The as-constructed pond volumes are providing "Enhanced" storage.

The beaver dam at the outlet has been removed since the inspection of this facility. The inlet structure should be repaired as soon as possible.

Fairview Estates Pond #168950

Inspection Summary 05/08/23:

Weather sunny with some rainfall within 48 hours.
Water level normal, clear minor algae growth.
Structures appear to be in good standing. Minor debris inside the outlet structure. Some erosion along the edges of the cable-crete access.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.9 below.



Table A-1.9: Fairview Pond 2021 Sediment Survey Data

Pond Survey Data		Design Information	
2020 As-built Volume from sediment cleanout (m3)	2285.2	MOECP Level	Level 1 "Enhanced"
Observed Permanent Pool Elevation	249	Service Area % Impervious	50
Top of Forebay from 2020 survey	248	Service Area (ha)	34.76
Forebay Depth	1	Design Permanent Pool Volume (m3)	4930
Top of Maincell from 2020 Survey	247.8	Permanent Pool Elevation	249
Main Cell Depth	1.2	Required PP Volume (m3)	4866
		Maintenance Trigger Volume (m3)	2855
		Pond Bottom Elevation	247.5
		Pond Depth	1.5
		Forebay Bottom	247.5
		Forebay Depth	1.5
		Forebay Depth Capacity	66.67%
		Pond Volume Capacity (Maintenance)	80.04%
		Pond Volume Capacity (Design)	46.35%

Maintenance Recommendations/Actions:

Fairview Pond will need significant material removal during the next major maintenance operation cycle to bring the facility to design grade and achieve "Enhanced" treatment levels. Currently it is operating at a "Normal" level of treatment. The issue was discovered during the 2020 sediment removal project, it appears the pond bottom was constructed higher than design grade.

Debris should be removed from the outlet structure. All other components of the pond appear to be functioning properly and there are no other major concerns.

Loggerhead 2 Pond #260465

Inspection Summary 05/08/23:

Weather Sunny, rain within last 48 hours. Water level normal, generally clear with some sheen, some algae development. Aquatic vegetation overgrowth blocking west inlet. Trash and debris throughout. Overland flow route missing rip-rap. Phragmite stand at southeast side of facility. Outfall channel requires reinstatement.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.10 below.



Table A-1.10: Loggerhead 2 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
Surveyed As-built Volume (m3)	6064	Treatment Level	Level 1 "Enhanced"
Sediment Volume (m3)	2039	Service Area % Impervious	42.8
Storage Volume (m3)	4025	Service Area (ha)	24.62
Observed Permanent Pool Elevation	252.73	Permanent Pool Elevation	252.8
East Forebay Top of Sediment	252.1	Design Permanent Pool Volume (m3)	4530
East Forebay Depth	0.63	Required PP Volume	3078
West Forebay Top of Sediment	252.2	Maintenance Trigger Volume (m3)	1816
West Forebay Depth	0.53	Pond Bottom Elevation	251.8
Main Cell Top of Sediment	251.8	Pond Depth	1
Main Cell Depth	0.93	East Forebay Bottom	251.8
		East Forebay Depth	1
		West Forebay Bottom	251.8
		West Forebay Depth	1
		East Forebay Depth Capacity	63.00%
		West Forebay Depth Capacity	53.00%
		Pond Volume Capacity (Maintenance)	221.64%
		Pond Volume Capacity (Design)	88.85%

Maintenance Recommendations/Actions:

The Loggerhead 2 Pond is in good condition overall. Based on the 2021 Sediment Survey the current capacity of this facility is above the minimum MECP maintenance trigger volumes. However, the forebays require sediment removal.

The outfall channel should be corrected when major maintenance operations. Vegetative overgrowth should also be removed from the facility during cleanout operations. This facility is scheduled for sediment removal of the forebays in 2024.

Loggerhead 1 Pond #168298

Inspection Summary 05/08/23:

Weather Sunny, rain within last 48 hours. Normal water level, slightly cloudy. Inlet headwall structural issues, cracking around the pipe and the wings of the headwall appear to be breaking apart. Outlet in good standing.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.11 below.

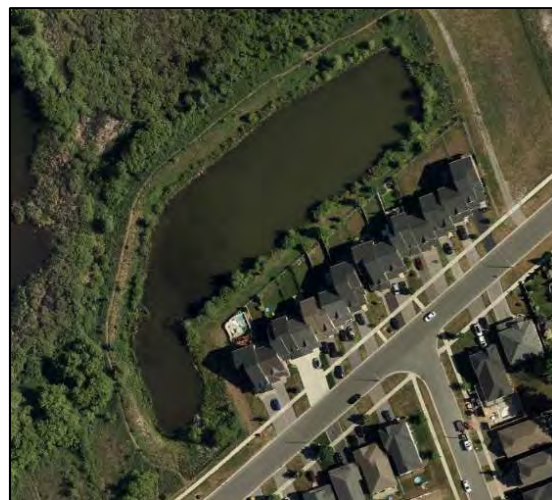


Table A-1.11: Loggerhead 1 2021 Sediment Survey Data

Pond Survey Data		Design Information	
As-built Volume (m3)	7094	Treatment Level	Level 1 "Enhanced"
Sediment Volume (m3)	1207	Service Area % Impervious	45
Storage Volume (m3)	5887	Service Area (ha)	41.63
Observed Permanent Pool Elevation	253.2	Design Permanent Pool Volume (m3)	5441
Forebay Top of Sediment	252.1	Design Permanent Pool Elevation	253.2
Forebay Depth	1.1	Required PP Volume	5204
Main Cell Top of Sediment	252.1	Maintenance Trigger Volume (m3)	3608
Main Cell Depth	1.1	Pond Bottom Elevation	252.1
		Pond Depth	1.1
		Forebay Bottom	252.2
		Forebay Depth	1
		Forebay Depth Capacity	● 110.00%
		Pond Volume Capacity (Maintenance)	● 163.17%
		Pond Volume Capacity (Design)	● 108.20%

Maintenance Recommendations/Actions:

The Loggerhead 1 ponds forebay was cleaned out in 2018.

Loggerhead 1 Pond is in good overall condition. The forebay was cleaned out in 2018 along with other maintenance. Based on the 2021 sediment survey the pond has a current capacity slightly above the design volume and well above the minimum MECP trigger volume.

The inlet is fully functional however it is in poor condition and has structural damage that will need to be repaired. The rest of the pond appears to be in good condition overall.

Cedargrove Pond #26044I

2023 Retrofit Summary

The Cedargrove Stormwater Management Facility underwent a major retrofit in 2023 to significantly increase the facilities capacity to properly accommodate additional upstream drainage areas. The newly constructed facility provides an “Enhanced” level of protection and contains the 100-year event. Other improvements include replacement and relocation of both the inlet and the outlet structures. The installation of a gravity drawdown valve to improve maintenance access and improvements to the overall aesthetics and landscape features within the pond block.



Table A-1.12 below has been updated to reflect the new design volumes and how they have been met through the as-built survey data.

Table A-1.12: Cedargrove 2023 Retrofit As-built Survey Data

2023 Retrofit As-built Pond Survey Data		Retrofit Design Information	
2023 Retrofit Permanent Pool Volume (m3)	7548	Treatment Level	Level 1 "Enhanced"
Observed Permanent Pool	235.03	Service Area % Impervious	40
Forebay Bottom Elevation	233.7	Service Area (ha)	68
Forebay Depth	1.33	Design Permanent Pool Volume (m3)	7650
Main cell Bottom Elevation	233	Required PP Volume	7650
Main Cell Depth	2.03	Permanent Pool Elevation	235.03
		Maintenance Trigger Volume (m3)	5475
		Pond Bottom Elevation	233
		Pond Depth	2.03
		Forebay Bottom	233.7
		Forebay Depth	1.33
		Forebay Depth Capacity	● 100.00%
		Pond Volume Capacity (Maintenance)	● 137.86%
		Pond Volume Capacity (Design)	● 98.67%

Maintenance Recommendations/Actions:

N/A

Wentworth Pond #168951

Inspection 05/09/23:

Weather hot and sunny, rain within the last 48 hours. Water level normal, clear. Trash within the pond along with trash scattered around the berm of the pond. Forebay berm is partially submerged. The ditch inlet leading to the forebay is overgrown. Silt curtains to be removed or reinstated as required. Outlet structure appears clogged.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.13 below.



Table A-1.13: Wentworth 2021 Sediment Survey Data

2021 Pond Survey Data		Design Report Information	
As-built Volume (m3)	1104	Treatment Level	Level 2 "Normal"
Sediment Volume (m3)	395	Service Area % Impervious	45
Storage Volume (m3)	709	Service Area (ha)	6.6
Observed Permanent Pool Level	196.5	Permanent Pool Elevation	196.5
Forebay Top of Sediment	195.3	Design Permanent Pool Volume (m3)	575
Forebay Depth	1.2	Required PP Volume (m3)	396
Main Cell Top of Sediment	195.1	Maintenance Trigger Volume (m3)	317
Main Cell Depth	1.4	Pond Bottom Elevation	195.5
		Pond Depth	1
		Forebay Bottom	195.5
		Forebay Depth	1
		Forebay Depth Capacity	● 120.00%
		Pond Volume Capacity (Maintenance)	● 223.66%
		Pond Volume Capacity (Design)	● 123.30%

Maintenance Recommendations/Actions:

The Wentworth ponds forebay was dredged in 2018.

Wentworth Pond has a current capacity above the minimum MECP maintenance trigger volume. The 2021 Sediment Survey indicates the pond is well above both maintenance trigger volumes and design volumes.

Excessive vegetation should be removed for easier access into the facility. The silt curtains in the forebay could be removed/replaced. Some of the vegetation in the ditch inlet and outlet should be removed so that water will flow better into the pond. The outlet should be unclogged, the water level was sitting high during the spring thaw.

College Park Pond #168275

Inspection Summary 05/10/23:

Weather sunny with rain in last 48 hours. Water level normal and clear however heavy algae present. There is some minor erosion on the outer berm of the pond and some on the path. The wetland portion of the pond is maintaining a permanent pool as the outlet structure is clogged. The orifice on the inlet structure is also installed upside down.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.14 below.



Table A-1.14: College Park 2021 Sediment Survey Data

2021 Pond Survey Data		Design Information	
2021 As-built Volume (m3)	2074	Treatment Level	Level 3 "Basic"
2021 Sediment Volume (m3)	502	Service Area % Impervious	32
2021 Storage Volume	1572	Service Area (ha)	83
Observed Permanent Pool Elevation	235.14	Wet Forebay Volume (m3)	1425
Forebay Top of Sediment	234.4	Required PP Volume (m3)	1469.9
Forebay Depth	0.74	Maintenance Trigger Volume (m3)	706
Main Cell Top of Sediment	n/a	Pond Bottom Elevation	235
Main Cell Depth	n/a	Pond Depth	0.5
		Forebay Bottom Elevation	234
		Forebay Depth	1.5
		Permanent Pool Elevation (Forebay)	235.5
		Forebay Depth Capacity	● 49.33%
		Pond Volume Capacity (Maintenance)	● 110.32%
		Pond Volume Capacity (MOECP 60%)	● 106.95%

Maintenance Recommendations/Actions:

The College Park Pond is designed as a dry pond with a wet forebay. The 2021 sediment survey identified that the forebay volume and depths are within an acceptable range, and overall, the water volume is sufficient to meet MECP "basic" water quality parameters.

The orifice on the inlet structure was corrected and the outlet was unclogged with pipes cleaned and flushed as part of a 2023 maintenance operation.

Major Bennett Pond #168952

Inspection Summary 05/09/23:

Weather Sunny. Water level slightly high, cloudy with some sheen present. Aquatic vegetation restricting flows at inlets and outlets. Garbage and debris present throughout pond block. Northwest inlet has detached from headwall. Access paths have rutting and ponding.

The most recent sediment survey for this facility was completed in 2021. The data from that survey has been provided in Table A-1.15 below.



Table A-1.15: Major Bennett 2021 Sediment Survey Data Analysis

2021 Pond Survey Data		Design Information	
As-built Volume (m3)	6883	Treatment Level	Level 2 "Normal"
Sediment Volume (m3)	715	Service Area % Impervious	64
Storage Volume (m3)	6168	Service Area (ha)	73.21
Observed Surface Elevation	192.24	Permanent Pool Elevation	192.2
Main Cell Top of Sediment	190.9	Design Permanent Pool Volume (m3)	6590
Main Cell Depth	1.34	Required PP Volume (m3)	6012
East Forebay top of Sediment	191	Maintenance Trigger Volume (m3)	3278
East Forebay Depth	1.24	Design Bottom	191
North Forebay Top of Sediment	191.5	Pond Depth	1.2
North Forebay Depth	0.74	Forebay Bottom	191
West Forebay Top of Sediment	191.4	Forebay Depths	1.2
West Forebay Depth	0.84		
		East Forebay Depth Capacity	103.33%
		North Forebay Depth Capacity	61.67%
		West Forebay Depth Capacity	70.00%
		Pond Volume Capacity (Maintenance)	188.16%
		Pond Volume Capacity (Design)	93.60%

Maintenance Recommendations/Actions:

The 2021 survey indicates that the facility is well within the maintenance threshold to provide a "Normal" level of protection.

Garbage and debris removal required. Overgrowth at inlets and outlets should be removed. Access paths should be regraded to prevent ponding though this is not critical for overall pond performance.

2.3 – Dry Pond Inspection Summaries

Eldon Court Pond #260439

Inspection Summary 05/11/23:

Weather sunny with no rain in the last 48 hours. The pond had no water in it at the time of inspection. The inlet structure has accumulated a lot of sediment and vegetation has started to grow in the inlet which may restrict flows. The inlet is in good structural condition. The outlet appears to be in good condition as well. There is an accumulation of trash and debris throughout the facility area.

Maintenance Requirements/Actions:

Remove garbage and debris, remove vegetation overgrowth from inlets and outlets.



Hilliard Pond #168289

Inspection Summary 05/11/23:

Weather sunny with no rain in the last 48 hours. There was no water in the pond at the time of the inspection. Inlets appear to be in working order although there is some overgrowth that could restrict flows. The outlet for this pond is in poor condition. The grate on the outlet has fallen off, the outlet is covered in debris, and a tree has fallen on top of the outlet. There is also a lot of debris scattered around the pond whether it be brush piles or garbage.

Maintenance Requirements/Actions:

Repair outlet grate, remove vegetation overgrowth from inlets and outlets, remove garbage and debris from facility.



Fairhaven Pond #168300

Inspection Summary 05/11/23:

Weather Sunny with no rain in the last 48 hours. The pond had no water in it at the time of the inspection. Trees appear to be in relatively good health. The pond has some minor erosion issues on the berm and around the outlet. The most pressing issue is with the inlet. The inlet is almost completely buried in sediment which is restricting flows.

Maintenance Requirements/Action:

Clear inlet of sediment and debris, and repair erosion at outlet CB location.



Hillview Pond #191346

Inspection Summary 05/11/23:

Weather sunny, recent rains. Some pooling water throughout the facility. Trees on the berms have fallen over and been cut up and left in piles along with multiple brush piles around the pond. The culvert inlets are in poor condition the inlet farthest to the west was completely submerged in sediment and the inlet to the east of that was also almost completely buried. There was also some debris building up around the outlet.

Maintenance Requirements/Action:

Remove debris from inlets, repair culverts, remove brush and debris.



Hemlock Street Pond #I68283

Inspection Summary 05/11/23:

Weather sunny, some rain in last 48 hours. There was some slight ponding in the low points of the facility due to recent rains. There are a few trees down around the pond. Additionally, there is also a lot of debris in the pond that needs to be cleared out. The inlet coming into the pond is half submerged in sediment which could restrict flows. The outlet appears to be in good standing.

Maintenance Requirements/Actions:

Clear inlets of debris/sediment, remove fallen trees



Leahy's Lane Pond #I90266

Inspection Summary 05/11/23:

Weather sunny and hot. No rain within the last 48 hours. The outlet has some concrete damage as it is starting to deteriorate and fall apart. There is also a concrete pipe section that was left over from construction. Some grassed areas have eroded.

Maintenance Requirements/Actions:

Repair erosion, repair concrete outlet, remove leftover pipe section.



Naish Pond #I90406

The Naish Pond was not inspected due to limited access.

Kawartha Heights #168277

Inspection Summary 05/12/23:

Weather sunny no rainfall in the last 48 hours. Water running through the Facility looked clear. The entire cell of the pond is full of aquatic vegetation. The outlet structure has several issues. The safety fence on top of the outlet has been destroyed. The outlet has been heavily vandalised. There appears to be a lot of erosion which is causing the concrete to shift out of place and crack. In the outfall area there are signs of heavy erosion and water has washed out the sediment from underneath the structure. There are also no stop logs in place it is unclear as to how many stop logs should be in place to provide the design objectives for the facility.

Known Issues:

The City of Peterborough experienced heavy storms and flooding on August 3rd, 2023, during that event the residential areas downstream of the Kawartha Heights Stormwater Management Facility flooded due to the heavy rain, a partial blockage of the culvert under Kawartha Heights Boulevard was also evident after the storm.

Maintenance Requirements/Actions:

Interim maintenance requirements to address the damaged safety fence, erosion issues etc. should be conducted as soon as possible. Major maintenance requirements will involve an engineered redesign of the outlet and downstream outfall to reduce future issues with flooding. Engineering solutions should be provided to improve the culvert flowing under Kawartha Heights Boulevard. This project should be moved forward on the major maintenance and retrofit priority list in alignment with the City's Flood Reduction Program.

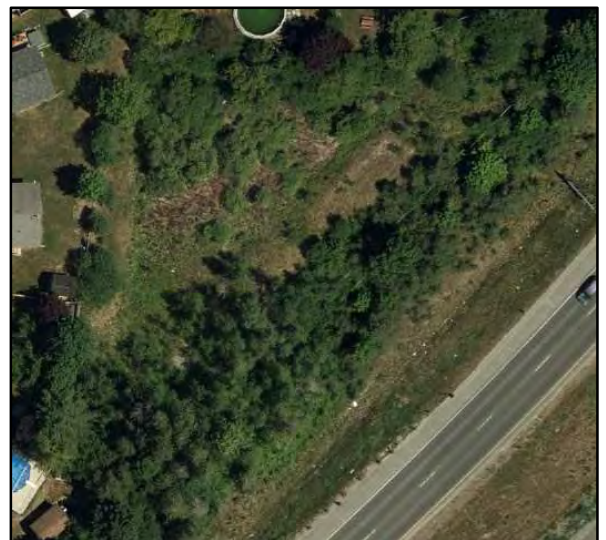
Stewart Drive Pond #168281

Inspection Summary 05/12/23:

Weather sunny, no rainfall in last 48 hours. The pond was mostly dry, there were some areas of saturation in the soil. The CSP inlet is in good condition but has overgrowth that could restrict flows. Woody plants made access difficult. Garbage throughout facility. The outlet is in good condition, with some plant growth on the riprap.

Maintenance Requirements/Actions:

Trim overgrowth, remove garbage and debris.



Medical Drive Ponds #302505

Inspection Summary 05/15/23:

Weather Sunny no rain in the last 48 hours. Water level normal, clear. Overgrowth potentially restricting flow at structures. Downed trees and piles of debris throughout. Erosion around headwalls. Eastern inlet has vegetation growth restricting flows. Northern inlet north section looks to be in good condition. Northern inlet in the southern section has debris trapped in it restricting flows. The outlet that connects to this inlet on the north section of the pond is clogged with debris and is bringing up the water level of the north section. The southern outlet has graffiti a lot of vegetation growth and the grate has been left open.

Maintenance Requirements/Actions:

Remove accumulated sediment and debris from structures, repair erosion around structures, remove and dispose of fallen trees, remove and dispose of wood piles,



Oil and Grit Separators

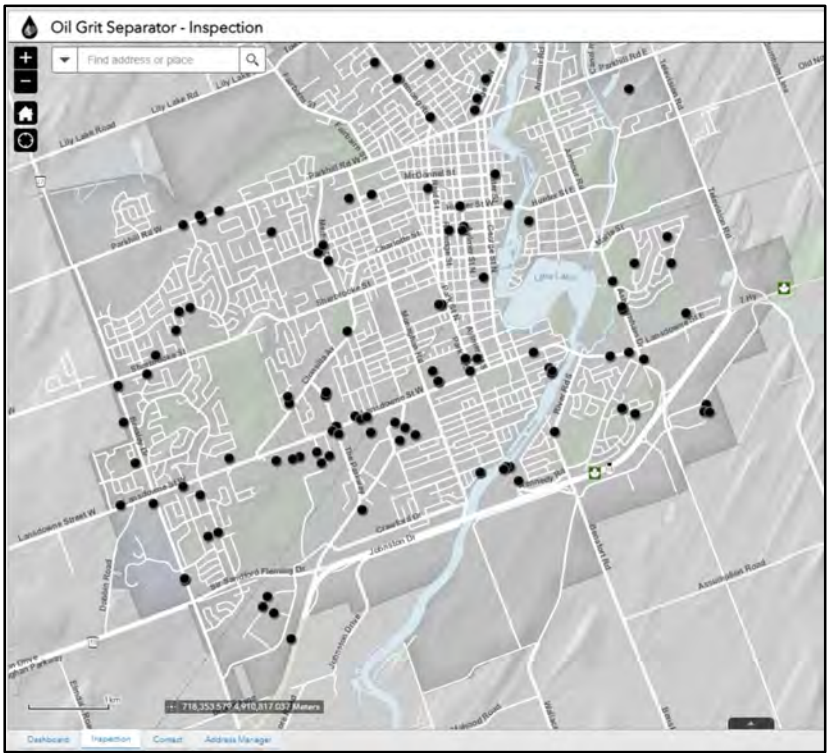
3.0 – OGS Inspection and Maintenance Program

The City owns and operates Oil and Grit Separators (OGS) both within the ROW and on City-owned lands outside of the ROW. Annual inspection reporting is required of all units to ensure that they are functioning properly for their intended purposes. Currently, the Wastewater Collection Department is responsible for conducting annual inspections and maintenance for the City owned OGS units. These inspections include a visual inspection of the unit as well as a measured silt depth reading. Maintenance of these units involves removing sediment from the unit by use of a vac truck.

In 2020 the City created a new inspection and maintenance system using GIS. The mapping not only identifies City owned units and allows staff to input inspection and maintenance information it also identifies which private OGS owners have submitted annual inspection/maintenance reports to help ensure compliance with the municipal sewer use by-law.

This provides easily identifiable contact management and follow-up requirements to track this reporting more effectively and synchronizes with our existing infrastructure management tools for real-time updates as additional units are added annually.

New OGS Monitoring GIS application



The following table outlines the various inspected maintenance requirements for City owned Oil and Grit separators as part of the 2023 inspection and maintenance cycle and the corrective actions taken to address these maintenance requirements.

Table 3.0 - City Owned OGS Inspection and Maintenance Operations

FACILITY ID	MODEL	INSPECTION DATE	MEASURED SILT	ALLOWED SILT	SERVICE REQUIRED	SHEEN	NOTES	CLEANED
102599	STC-750	9/26/2023	100	230	N	N		N
102600	STC-2000	10/3/2023	75	350	N	N		N
108886	STC-5000	10/3/2023	75	500	N	N		N
108886	STC-5000	10/3/2023	75	500	N	N		N
180055	STC-2000	10/3/2023	200	350	N	N		N
191669	STC-750	9/26/2023	150	230	N	N		N
300413	STC-14000	10/4/2023	125	230	N	N		N
300071	STC-14000	10/4/2023	300	425	N	N		N
300071	STC-14000	10/4/2023	300	425	N	N		N
300075	STC-14000	10/4/2023	450	425	Y	N		Y
300861	STC-4000	11/14/2023	450	400	Y	N		Y
300861	STC-4000	10/4/2023	450	400	Y	N		Y
300881	STC-2000	10/4/2023	100	350	N	N		N
300891	STC-3000	10/4/2023	100	475	N	N		N
300579	STC-14000	10/3/2023	200	425	N	N		N
300957	STC-2000	10/3/2023	25	350	N	N	Needs parging	N
301177	n/a	9/26/2023	100			N		N
301271	STC-2000	10/3/2023	100	350	N	N		N
302007	STC-2000	10/3/2023	700	350	Y	N		Y
302007	STC-2000	10/3/2023	700	350	Y	N		Y
302007	STC-2000	10/3/2023	700	350	Y	N	Damage to Outlet riser	Y
303423	STC-1500	10/3/2023	75	400	N	N		N
303425	STC-2000	10/3/2023	50	350	N	N		N
303795	STC-2000	6/13/2023	700	350	Y	N		Y
303795	STC-2000	10/3/2023	700	350	Y	N		Y
303795	STC-2000	10/4/2023	700	350	Y	N		Y
305351	STC-750	9/26/2023	75	230	N	N		N
308297		9/26/2023	200	610	N	N		N

308413		10/3/2023	250	610	N	N		N
308473		10/3/2023	150	610	N	N		N
310621	STC-300	9/26/2023	240	230	Y	N		Y
310631	STC-300	9/26/2023	200	225	N	N		N
310633	STC-2000	10/3/2023	200	350	N	N		N
310635	STC-300	10/3/2023	0	225	N	N		Y
310641	EOS-3000	10/3/2023	500	475	Y	N		Y
310691	STC-300	9/26/2023	100	225	N	N		N
310693	STC-300	9/26/2023	50	225	N	N		N
310697	STC-750	9/26/2023	50	230	N	N		N
310711	STC-2000	10/3/2023	200	350	N	N	Needs parging	N


Low Impact Development


4.0 – LID Inspection and Maintenance Program

The City is working through the integration of LID into the backend GIS applications for inspection tracking. The City must implement these tracking systems as soon as possible as more and more LID features are being built on every project to meet the requirements of the CLI-ECA design criteria. Ultimately this information will be tracked in the Stormwater Management Hub but currently, visual inspections have been conducted and reported on manually.

The following summaries outline the inspection and maintenance operations for City-owned LID features in 2023:

Bethune Street Low Impact Development Features

183 Bethune St. (August 15, 2023)		
Location	183 Bethune St running underneath the driveway on the west-hand side of the road, the curb bends into the swale from Bethune St.	
Description	Grassed swale between the sidewalk and road with PVC pipe running underneath the driveway. Break in curb leading into the swale.	
Condition	Good condition structurally, with some sediment in the inlet and some debris in the bottom of the swale	
Maintenance required	Clean out accumulated sediment in spring 2024	

West Side of Bethune Corner of McDonnel (August 15, 2023)		
Location	West-hand side of Bethune St at the corner of McDonnel between the sidewalk and Bethune St on the south-hand side of McDonnel St	
Description	Grassed infiltration swale with curb cut inlet.	
Condition	The LID is in good condition but there is a small buildup of sediment on the curb leading to the swale.	
Maintenance Required	N/A	

West side of the Bethune St Between Simcoe and Charlotte (August 15, 2023)	
Location	West side of Bethune St between Simcoe and Charlotte, between the sidewalk and Bethune St East of the parking lot
Description	Grassed infiltration swale with curb cut inlet.
Condition	This LID is in good condition with no issues.
Maintenance Required	N/A




West side of the Bethune Corner of Wolfe (August 15, 2023)	
Location	West-hand side of Bethune St. just south of Wolfe St between the fence and the curb.
Description	Grassed infiltration swale with two trees. Curb cut inlet
Condition	LID looks to be in generally good condition, some sections of the grass are missing but not major vegetation loss
Maintenance Required	N/A



Moorecraig and Roper Low Impact Development

West side of Moorecraig Rd. (September 2023)	
Location	West side of Moorecraig Rd. in the boulevard.
Description	4 grassed infiltration swales complete with curb cut inlets and monitoring wells.
Condition	Generally good condition, sediment accumulation at curb cuts. Thatch buildup in swales.
Maintenance Required	Remove accumulated sediment and debris from the inlet, and remove thatch from the swale. Replace monitoring well missing cap.



South Side of Roper Drive. (September 2023)		
Location	South side of Roper drive between Moorecraig and Wallis	
Description	6 Grassed infiltration swale with two trees. Curb cut inlet	
Condition	Generally good condition, sediment accumulation at inlets, leaf and debris build up in swale. Cap missing from one monitoring well. One outlet curb cut blocked by a mailbox	
Maintenance Required	Remove accumulated sediment and debris from the inlet, and remove leaves from swales. Replace monitoring well missing cap. Move mailbox from outlet.	

Inlets and Outfalls

5.0 – Outfalls

The City conducts visual inspections of all outfalls on a 3-year cycle conducting them in thirds each year. The Stormwater Quality Master Plan has identified certain outfalls that require routine inspection/sampling which are underlined.

Below is a table of completed outfall inspections in the most recent 3-year cycle including any identified maintenance items to be addressed. The remaining third of these inspections are scheduled to be conducted in 2024.

Table 4.0: Critical Outfall Inspections

Outfall Facility ID	Inspection 2022	Inspection 2023	Maintenance Requirements/Notes:
Underlined Facility ID Numbers indicate Outfalls requiring routine inspection as indicated by the Stormwater Quality Master Plan			
167982		X	Culvert structure with no structural issues some natural debris in the outlet and sheen, generally in good condition.
139874		X	Concrete pipe with winged headwall, some litter in the swale, generally in good condition.
139931		X	PVC pipe, good condition, graffiti on the headwall.
139947		X	Concrete pipe with a headwall, good condition, water flowing out with some sediment, erosion has covered the wing walls.
139977		X	Culvert, no sediment, good condition
139819		X	Structure in good condition, trash and sediment build-up at outlet.
139941		X	Good condition, pooling at outlet, erosion of ground surface past outlet.
139890		X	Good Condition, clear water, minor vandalism
139970		X	Pipe is built into the bridge and looks to be in good structural condition.
139967		X	Pipe is built into the underneath of the bridge the structure in good condition. Graffiti and trash around outlet.
166637		X	Pipe is located underneath a bridge with the bridge acting as a headwall. There does not appear to be any structural damage and the water flowing out of the pipe appears to be clear.
139975		X	
140011		X	End of the pipe has cracked, and pieces have chipped off. Condition of the pipe inside the concrete is unknown.
166721		X	Pipe is set into a concrete wall both the wall pipe in good condition, outlet pipe is submerged
139917		X	This outlet is in the Ontario Power Generation Station and is blocked by a fence unable to do the inspection.
166350		X	Outlet is in good condition, cloudy water vegetation on grate.

139817		X	Pipe is in good condition, clear water. Erosion around pipe causing it to float.
139816		X	Outlet in need of maintenance, major structural issues as well as the section of pipe that is not visible is clogged allowing water to backfill and flow up through the catch basin causing erosion of road surface.
166349		X	Good condition, sediment building up in the pipe and graffiti on the headwall/bridge.
191679		X	Good condition, minor damage to grate.
165341		X	This outlet appears to be in fair condition, surrounding bridge is damaged. Concrete around pipe showing signs of wear.
139946		X	Outlet looks in good condition the culvert is built into the bridge which is preventing any erosion and preventing any vegetation growth around the outlet.
140032		X	Outlet in good condition.
139965		X	The outlet is located under the bridge so a proper inspection cannot be made.
139818		X	Unable to locate.
139860		X	Outlet is a concrete winged headwall structure. It is in good condition water flow is clear.
300885		X	Unable to locate.
300889		X	This outlet is in good condition, partially submerged
139940		X	Overgrowth made this outlet inaccessible.
139867		X	Poor condition section is buried in sediment.
139999		X	Good condition, vandalism present (graffiti)
139864		X	Good condition
168035		X	Pipe is submerged under the water there are armour stones holding the pipe in place, some bolts missing
139813		X	Very poor condition, very worn out falling apart holes throughout the brittle pipe. Erosion is exposing pipe.
<u>139845</u>	X		Poor condition, exposed rebar, damaged wingwall, sediment accumulation. The secondary inlet in fair condition, damaged trash rack.
139908	X		Good condition, rust on the CSP. Erosion on the concrete outflow channel. Sediment is accumulating.
139979	X		Unable to identify the outlet due to overgrowth.
<u>140031</u>	X		Fair condition.
<u>139913</u>	X		The main outlet has minor concrete damage. The box culvert is in good condition.
<u>139922</u>	X		Outlet in good condition. Minor rust and dents on the CSP.
<u>167917</u>	X		Good condition, graffiti on headwall
139906	X		Private property unable to inspect.
139861	X		Good condition, sediment accumulation on track rack.
<u>140016</u>	X		Good condition, trash pickup required.
<u>139995</u>	X		Fair condition, exposed rebar, erosion on the concrete outfall channel, trash rack is missing bars.
139983	X		Fair condition. Headwall showing signs of wear.
<u>262497 (16566)</u>	X		Excellent Condition

140033	X		Good condition, graffiti on headwall, damaged fence, erosion in creek. Garbage is accumulating in the outfall channel.
16569			unable to inspect, could not locate
139814			
139830	X		This outlet cannot be inspected, submerged underwater.
139831	X		Good condition, outlet pipe covered in fallen trees and overgrowth, erosion in the ditch from uprooted trees.
166363			Unable to identify where the outlet was located
166414			Unable to complete inspection located on private property.
139910	X		Difficult to access, CSP is bent but outlet still functional.
139873	X		Fair condition, trash rack to be bolted back on, headwall is vandalized, water looks clear.
16569	X		Good condition, minor sediment and debris accumulation.
160321	X		Good condition, minor overgrowth.
139976	X		Good condition.
139857	X		Good condition, minor overgrowth
139832	X		Fair condition, minor sediment and debris accumulation.
139849	X		Good condition, CSP is slightly bent but still fully functional, some foamy water flowing, minor sediment accumulation.
165201	X		Good condition.
16570		X	Good condition.
139837		X	Erosion of the swale causing the formerly installed concrete swale to fall apart and flow into the river. The headwall is cracked and eroded leaving it very exposed. Approx. 1 m behind the headwall there is a separation between the two sections of pipe this has caused a hole to erode behind the headwall down into the pipe.
139870		X	Good condition.
139846		X	Good condition
166339		X	Fair condition
139850		X	Fair condition, fence damage, debris build up at trash rack.
139892		X	Completely submerged in sediment
139968		X	Fair Condition, Graffiti on structure
166397		X	Fair Condition, trash rack open and missing lock.
139974		X	Good Condition
139939		X	Good Condition, graffiti on structure
139953		X	Good Condition
139878			
139889			
139899			
140007			

140017			
139972			
166502			
166778			
139937			
182771			
139844			
140003			
140004 (166477)			
166386			
139993			
166338		X	Good condition, graffiti removal required
161535			
139982			
178768			
139822			
139990			
139989			
167896			
168245			
139836			
139858			
139872			
139963			
139984			
139996			
139958			
140019			
139834			
300595			
300857			
301305			
303087		X	Good condition, graffiti removal required, debris on rack
303265			

305219			
305335			
308025			
308791			
311409			
311775			

5.1 – Critical Inlets

City staff conduct routine inspections of certain inlets that have been deemed critical. These inlets are a high priority as they convey large flows and pose potential flooding risk if obstructed. The following table outlines the critical inlets that were inspected in 2022/2023 and the required maintenance items to be addressed at each. The remaining inspections are to be completed in 2024.

Table 5.0: Critical Inlet inspection summary

Inlet Facility ID	Inlet Type	Inspection 2022	Inspection 2023	Maintenance Requirements/Notes:
124750	Catchbasin		X	Good condition, debris on grate
124946	Catchbasin		X	Good condition, overgrowth around inlet
125754	Catchbasin	X		Good condition, minor debris in basin
125284	Catchbasin	X		Poor condition, concrete damage.
125785	Catchbasin		X	Good condition
127093	Catchbasin		X	Good condition
127279	Catchbasin		X	Good condition
127407	Catchbasin	X		Good condition
127630	Catchbasin		X	Good condition
127631	Catchbasin		X	Good condition
127636	Catchbasin		X	Good condition
127637	Catchbasin		X	Good condition, debris requires removal
127643	Catchbasin		X	Good condition, sediment and debris built up on inlet.
127644	Catchbasin		X	Good condition
127647	Catchbasin		X	Good condition
127648	Catchbasin		X	Good condition
127650	Catchbasin		X	Good condition, debris in inlet
127651	Catchbasin		X	Fair condition, debris removal required
127652	Catchbasin		X	Good condition
127655	Catchbasin		X	Good condition, rocks in inlet
127656	Catchbasin		X	Good condition, erosion in inlet swale
127659	Catchbasin		X	Good condition
127660	Catchbasin		X	Good condition
127661	Catchbasin		X	Good condition

127662	Catchbasin		X	Good condition, overgrowth to be trimmed.
127663	Catchbasin		X	Fair condition, inlet grate incorrect size.
127664	Catchbasin		X	Good condition
127665	Catchbasin		X	Good condition
127666	Catchbasin		X	Good condition, minor sediment accumulation
127667	Catchbasin		X	Good condition
127668	Catchbasin		X	Good condition, moss on trash rack
127669	Catchbasin		X	Good condition
127670	Catchbasin		X	Good condition
127671	Catchbasin		X	Good condition
127672	Catchbasin		X	Good condition
127673	Catchbasin		X	Good condition
127674	Catchbasin		X	Good condition, overgrowth to be trimmed.
127675	Catchbasin		X	Good condition, minor erosion, and overgrowth present.
136617	Catchbasin		X	Good condition, surround road area in need of repair.
136618	Catchbasin		X	Good condition
136619	Catchbasin		X	Fair condition, concrete damage
136620	Catchbasin		X	Good condition
136623	Catchbasin		X	Poor condition, inlet is covered in asphalt from the road
136624	Catchbasin		X	Good condition
136627	Catchbasin		X	Poor condition, concrete damage and misalignment of grate.
136628	Catchbasin		X	Poor condition, asphalt damage and misalignment of grate
136629	Catchbasin		X	Fair condition, debris and sediment blocking the entrance to the inlet
136630	Catchbasin		X	Fair condition, concrete damage to the inside of the inlet
136637	Catchbasin		X	Fair condition, erosion and asphalt damage surrounding inlet, filter fabric covering grate,
136638	Catchbasin		X	Good condition, filter fabric covering grate
136639	Catchbasin		X	Good condition, filter fabric covering grate
136641	Catchbasin		X	Good condition
136648	Catchbasin		X	Fair condition, brush pile on top of grate to be removed.
136650	Catchbasin		X	Filter fabric on unit.
136724	Catchbasin		X	Good condition
136725	Catchbasin		X	Fair condition, remove accumulated sediment
136728	Catchbasin		X	Good condition
136730	Catchbasin		X	Good condition

136732	Catchbasin		X	Fair condition, sediment and debris removal required.
136733	Catchbasin		X	Good condition
136734	Catchbasin		X	Good condition
136735	Catchbasin		X	Good condition
136736	Catchbasin		X	Good condition, sediment and debris removal required.
136737	Catchbasin		X	Fair condition, sediment and debris removal required.
140216	Catchbasin		X	Good condition
141260	Catchbasin		X	Good condition
141762	Catchbasin		X	Poor condition, grate is damage and misaligned
141763	Catchbasin		X	Poor condition, concrete damage
142425	Catchbasin		X	Good condition
142900	Catchbasin		X	Good condition
160130	Culvert		X	Good condition
160136	Culvert		X	Good condition
160137	Culvert		X	Good condition
160138	Culvert		X	Good condition
160139	Culvert		X	Good condition
160141	Culvert		X	Good condition
165292	Culvert		X	Fair condition, debris build up around culvert
166124	Culvert		X	Highly Critical Kawartha heights Blvd. inlet flooded during August 3 event
166356	Catchbasin		X	Good condition
166685	Catchbasin		X	Good condition
167059	Culvert		X	Poor condition, blocked with debris, damaged grate
167539	Catchbasin		X	Good condition
167702	Catchbasin		X	Overgrown with vegetation unable to locate
167703	Catchbasin		X	Overgrown with vegetation unable to locate
168242	Catchbasin		X	Good condition
168253	Catchbasin		X	Good condition
169132	Culvert		X	Good condition
169134	Culvert	X		Good condition, minor overgrowth
169135	Culvert	X		Good condition
169136	Culvert		X	Good condition
169139	Culvert		X	Poor condition, debris and sediment accumulation restricting flows, water level impacted by debris accumulation. Culvert is damaged and vandalized.

174751	Culvert		X	Good condition, beaver dam near inlet
174765	Culvert			
174768	Culvert			
174769	Culvert			
174770	Culvert			
174771	Culvert			
174948	Catchbasin			
175012	Catchbasin			
175410	Culvert	X		Poor condition, damaged pipe.
175411	Culvert			
175412	Culvert			
175413	Culvert			
175416	Culvert			
175423	Culvert			
175425	Culvert			
175426	Culvert			
175427	Culvert			
175433	Culvert			
175434	Culvert			
175435	Culvert			
175436	Culvert			
175438	Culvert			
175439	Culvert			
175440	Culvert			
175441	Culvert			
175443	Culvert			
175444	Culvert			
175451	Culvert			
175458	Culvert			
175459	Culvert			
175460	Culvert			
175461	Culvert			
175472	Culvert			
175473	Culvert			

175474	Culvert			
175475	Culvert			
175476	Culvert			
175477	Culvert			
175540	Culvert			
175541	Culvert			
175556	Culvert			
175557	Culvert			
175558	Culvert			
175559	Culvert			
175560	Culvert			
175561	Culvert			
175562	Culvert			
175563	Culvert			
175570	Culvert			
177686	Catchbasin		X	Fair condition, vegetation caught in grate.
177815	Catchbasin			
177840	Catchbasin	X		Poor condition, concrete damage, erosion of inlet ditch, sediment accumulation.
177896	Catchbasin			
177898	Catchbasin			
177901	Catchbasin			
178002	Catchbasin			
178149	Catchbasin		X	Poor condition, damaged grate, major debris and garbage obstructing flows, vandalism.
178192	Catchbasin			
178200	Catchbasin		X	Good condition, sediment build up
178207	Catchbasin		X	Fair condition, inlet cracked.
178208	Catchbasin		X	Good condition
178623	Catchbasin		X	Fair condition, minor concrete damage, minor erosion.
178209	Catchbasin		X	Good condition
178627	Catchbasin		X	Fair condition, damaged concrete, erosion of inlet channel sediment/debris accumulation.
178628	Catchbasin		X	Good condition, debris removal required.
178210	Catchbasin		X	Some issues with the trash rack sitting properly
179168	Catchbasin			
179169	Catchbasin			

179766	Catchbasin			
182681	Catchbasin			
182915	Catchbasin			
183475	Catchbasin			
183488	Catchbasin			
183572	Catchbasin		X	Good condition
183590	Catchbasin		X	Good condition
183846	Catchbasin		X	Good condition
183986	Catchbasin	X		Good condition
184439	Catchbasin	X		Unable to locate due to fallen trees and debris.
184464	Catchbasin			
184510	Catchbasin			
184512	Catchbasin			
185190	Catchbasin	X		Good condition
191006	Catchbasin			
192761	Catchbasin			
192763	Catchbasin			
215986	Catchbasin	X		Good condition
215961	Catchbasin	X		Poor condition. Major sediment and debris accumulation restricting flows.
260100	Catchbasin		X	Good condition
263379	Culvert			
263391	Culvert			
263421	Culvert			
263422	Culvert			
263423	Culvert			
263424	Culvert			
263450	Culvert			
263478	Culvert			
263679	Culvert			
263680	Culvert			
264320	Catchbasin			
264399	Culvert			
264403	Culvert			
264411	Culvert			

264412	Culvert			
264520	Culvert			
300111	Catchbasin			
300113	Catchbasin			
300225	Catchbasin			
300249	Catchbasin			
300273	Catchbasin			
300279	Catchbasin			
300307	Catchbasin			
300339	Catchbasin			
300737	Catchbasin			
300865	Culvert			
300897	Catchbasin			
300901	Catchbasin			
301101	Catchbasin			
301161	Culvert			
301263	Catchbasin			
301287	Catchbasin			
301303	Culvert			
301405	Catchbasin			
302077	Culvert			
302585	Catchbasin	X		Good condition
302589	Catchbasin	X		Fair condition, sediment and debris accumulation.
302591	Catchbasin	X		Fair condition, loose trash rack.
302625	Catchbasin	X		Good condition
302639	Catchbasin			
302795	PVC Pipe	X		Good condition, minor erosion of side slopes.
302699	Catchbasin	X		Fair condition, vandalism and heavy invasive presence in inlet swale.
302993	Catchbasin			
303187	Catchbasin			
303189	Catchbasin			
304047	Culvert			
304965	Catchbasin			
305137	Catchbasin			

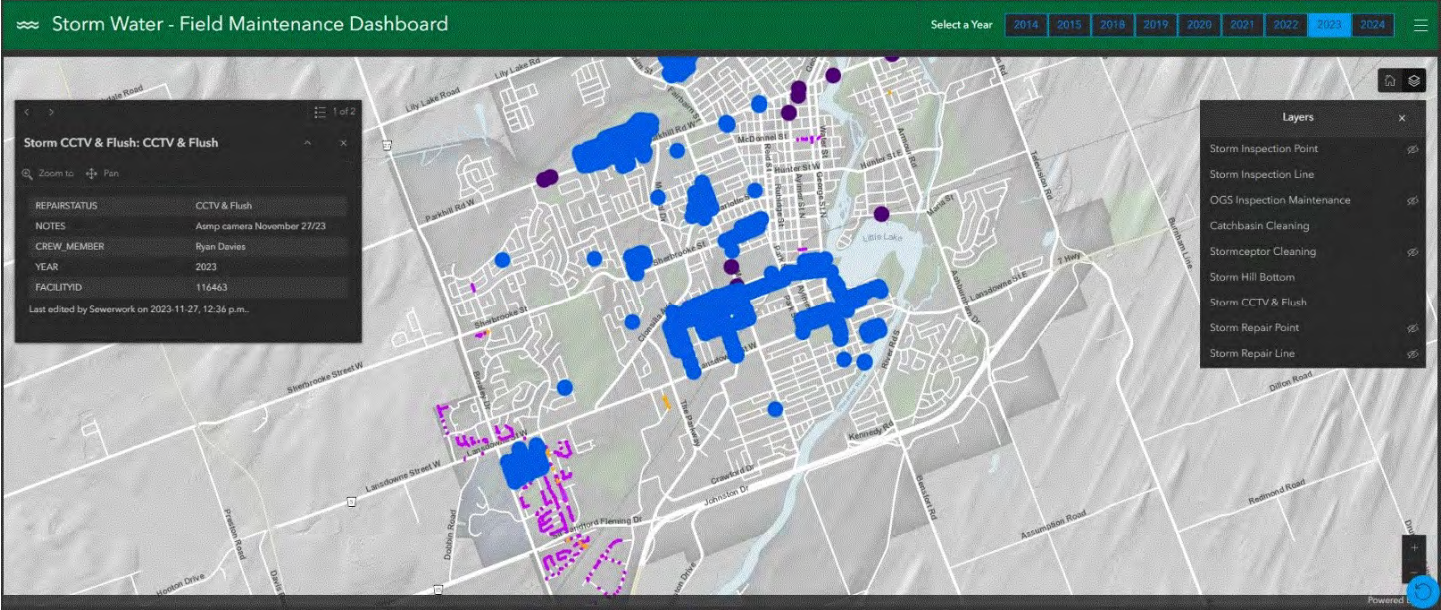
305301	Catchbasin			
305373	Culvert			
305853	Catchbasin			
307331	Catchbasin	X		Good condition, minor sediment accumulation.
307761	Culvert			
307791	Culvert			
307993	Culvert			
307995	Culvert			
308021	Culvert			
308023	Catchbasin			
308283	Catchbasin			
308399	Catchbasin			
309837	Catchbasin			
309899	Catchbasin			
309901	Catchbasin			
309907	Catchbasin			
309915	Catchbasin			
309921	Catchbasin			
309923	Catchbasin			
310089	Culvert	X		Good condition
310513	Culvert			
310533	Catchbasin			
310539	Catchbasin			
310549	Catchbasin			
310561	Catchbasin			
310565	Catchbasin			
313685	Catchbasin			

Storm Sewers

6.0 – Storm Sewer Inspection and Maintenance Program

Most storm sewers in Peterborough are inspected and maintained on a 5-year cycle. Inspections are carried out by flushing/cleaning and taking CCTV videos of each sewer. Maintenance items are then identified by reviewing the videos and a work plan is created to address the maintenance tasks. In many cases, trenchless technology is used to realign and repair sewers. The City uses both internal and external resources to conduct maintenance operations. Maintenance items that require excavation (open cut) are tracked and form part of the City’s prioritization matrix for capital works reconstruction projects. These operations are tracked and managed through the use of a custom-made GIS application.

Stormwater Field Maintenance Dashboard



Below is a summary of the Storm Sewer maintenance tasks that were conducted in 2023 representing roughly 20% of the total sewer infrastructure in Peterborough:

2023 Storm Sewer Inspection and Maintenance Task	Quantity
Storm Sewers Flushed and Cleaned (External Contractor)	30,025 m
Storm Sewers Flushed and Cleaned (Internal)	16,430 m
Storm Lead Flushed and Cleaned (External Contractor)	7,278 m
Storm Lead Reline (External Contractor)	156 m
Storm Main Reline (External Contractor)	1,231 m
Catchbasin Cleanout (Internal)	823

Alterations to the Stormwater Management System

7.0 – Capital Works Alterations

Lansdowne Street West at Clonsilla

Project Description:

The scope of this project includes the removal and replacement of existing storm sewers on Lansdowne Street and Clonsilla Avenue, including the recalculation and resizing of sewers to accommodate the applicable design rainfall event.

This project did not pose a significant drinking water threat.

Description of Storm System Alteration	Quantity
Remove and Dispose of Existing Storm Sewer	321 meters
Remove and Dispose of Existing Structure	12 units
Supply and Install New Storm Sewer	312 meters
Supply and Install New Storm Structure	7 units
Infiltration Chamber System	1
OGS unit (EF08)	1

7.1 – Assumed Infrastructure Alterations

Heritage Park Phase 2, Stage 3

Project Description:

Subdivision Assumption for Heritage Park Phase 2, Stage 3. Assumed Infrastructure includes Storm sewers to service the development.

This project did not pose a significant drinking water threat.

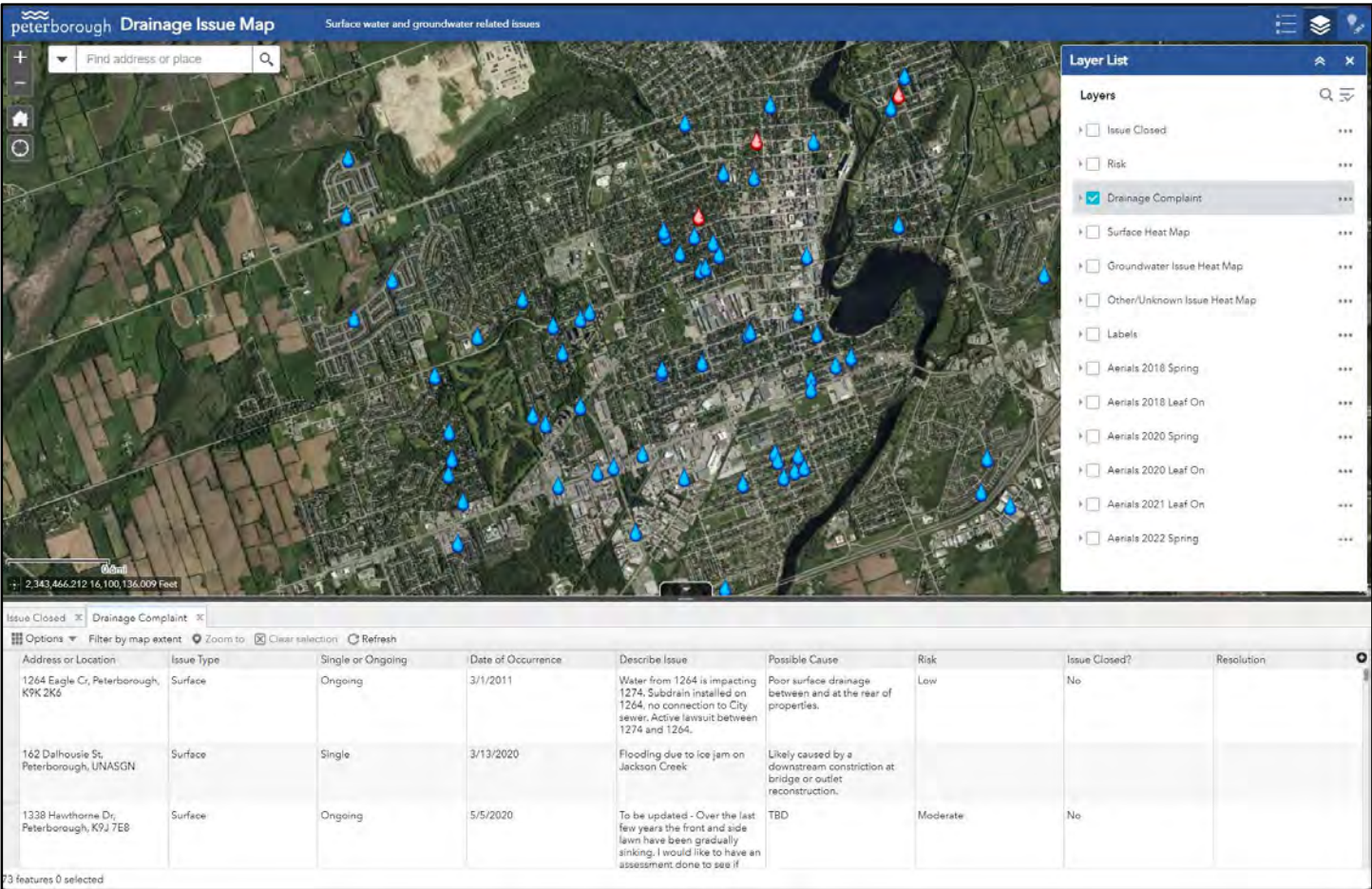
Description of Storm System Alteration	Quantity
Addition of Storm Sewer Inlets (Catchbasins)	16 units
Addition of Storm Manholes	20 units
Addition of Stormwater Main Line	1049.62 meters

Operating Issues

10.0 – Complaints

When complaints and issues are identified either by residents or internal staff the City’s Infrastructure Management and Growth Planning Division makes note of the issues using an integrated GIS application. The application has been created such that Stormwater Management issues and complaints can be tracked and corrected/monitored accordingly.

Issues are categorized by type, occurrence, and risk factor to establish higher-priority issues to be addressed as soon as possible. As items are resolved the issues are closed.



The following Table identifies the various issues and complaints descriptions of the issues, possible causes and if possible, what actionable items may need to be done to correct the problem.

Note: The City of Peterborough experienced a significant weather event on August 3rd, 2024

Table 6.0: Summary of Stormwater Management Complaints and Issues

Address or Location	Issue Type	Single or Ongoing	Date of Occurrence	Describe Issue	Possible Cause	Risk	Issue Closed	Resolution
Eagle Cr, Peterborough,	Surface	Ongoing	3/1/2011	subdrain issue	Poor surface drainage between and at the rear of properties.	Low	No	
Dalhousie St, Peterborough,	Surface	Single	3/13/2020	Flooding due to ice jam on Jackson Creek	Likely caused by a downstream construction at bridge or outlet reconstruction.	High	Yes	Completion of outlet structure should have removed constriction.
Hawthorne Dr, Peterborough	Surface	Ongoing	5/5/2020	To be updated - Over the last few years the front and side lawn have been gradually sinking. I would like to have an assessment done to see if there is any structured damage to the area from the fallout of this project or to the storm drain located located at the front of my house off of Hawthorne Drive	TBD	Moderate	No	
Sherbrooke Street	Surface	Ongoing	3/9/2020	Storm sewer at bottom of Sherbrooke Street hill that is a "geyser" shooting water during heavy rain events. Location is approximate.	Undersized storm sewer system and/or inadequate overland flow route.	High	No	
Princess Street	Surface	Ongoing	1/1/2009	Street and driveway fill with water during moderate rainfall. Backs up to sidewalk, driveway	Lack of proper overland flow route and no catchbasins on street.	High	No	

				sand sometimes up to foundation of home.				
Aylmer Street	Surface	Ongoing	4/5/2023	Water from road appear to drain off road onto sidewalk, then onto Aylmer property. Super elevated road creates significant drainage area.	Missing curb section upstream of CB. Lack of adequate major overland conveyance.	High	Yes	Redirected drainage from road into CB, uncovered additional CB and cleared debris. Added elevated honeycomb grate to CB to avoid clogging.
Trentway Vista	Surface	Ongoing	3/29/2023	Rear yard surface flooding during heavy rain and spring melt.	Partially blocked year yard swale at Trentway Vista. Possible issue with pool also blocking rear yard drainage.	Moderate	No	
Caddy St.	Surface	Ongoing	6/24/2023	Caddy St. floods when we get heavy rainfall, pipe into creek is blocked. Public works has known about this for some time but doesn't seem to fix the problem.	Clogged catch basin and/or sewer.	High	Yes	PW completed ditching last year (2022) and WWC checked the structure and storm system - structure & system were sound & free from blockage and debris. Foreman is on site now and says structure is clear. ROW is draining.
Sherbrooke Street	Surface	Ongoing	7/16/2023	Significant surface flooding, beyond curb and road impacting Sherbrooke	No overland flow route, low point in road and inadequate inlet capacity.	High	No	

				house. Low point in road, exceeds inlet and sewer capacity.				
Huntington Circle	Surface	Ongoing	7/11/2023	Runoff from Dealership collects at south east corner of property (possible SWM pond), during heavy rains it spills to rear yard CB north of Huntington, CB gets blocked or can't handle flow and drains between homes up to foundation.	Inadequate grading and SWM	Moderate	No	
Gilmour St	Surface	Ongoing	5/1/2019	In spring there is water on the lawn area on the Monaghan and on the Gilmour sides of this property. It also sits in the street at the intersection on occasion. There is flooding into the southwest corner of the homeowner's basement on occasion as well.	A possible cause of this issue would be a floor drain but in different years the cause was identified as "other".	High	No	
Gilmour St	Ground water	Single	7/13/2004	2004 during flood two feet of water in the basement. raised a section of the floor in the basement. pooling water in the back yard coming off the street.	Water coming in through basement floor. and through the basement door	Low	No	
Rogers St	Surface	Single	1/1/2020	This event was in January 2020, before the completion of the work on Curtis Creek where it meets Tivey St. This has happened once before (in 2018), but it was worse in 2020. The maximum depth of the water in our yard was about 24"	It seems to happen only when the following factors combine frozen ground and a series of warm days/winter rainfall. With no way for water to be absorbed into the ground, it heads south from the creek.	High	Yes	Issue is assumed resolved after the completion of culvert upgrade at Tivey St.

Elias Av	Surface	Single	7/1/2004	approximately 1 meter of water in basement and 40 cm in backyard	2004 flood, water entered through sump pump hole.	Moderate	No	
Stocker Rd	Surface	Single	1/7/2004	Our street was entirely flooded. The depth varied across it but the deepest was close to in front of our place and was up between my knees and waist. The western half of the street appeared to be more flooded with water going up almost to the buildings themselves on the part where Stocker Road turns north.	Potential clogged storm drain during heavy rainfall on the south side of Stocker just west of the park.	High	No	
Middlefield Rd	Surface	Single	3/16/2011	Mid-March 2011, following a heavy localized rainfall flooding in basement.	basement floor drain	Low	No	
Armour Rd	Ground water		1/1/2020	Basement flooding	through the walls	High	Yes	Assumed issue is resolved after completion of Curtis Creek culvert upgrades.
Springbrook Drive	Surface	Ongoing	12/1/2020	pooling in back yard and flooding in basement.	owner claims Home Hardware on Lansdowne redid their parking lot this year, we stay awake to turn on pumps in our backyard, so our pool and basement do not flood.	Moderate	No	
Lee St	Other/Uknown	Single	10/17/2021	Sewer backup. Source (sani or stm) unknown.	floor drain in basement.	High	No	

Lansdowne St E	Surface	Single	7/1/2023	Flooding in yard and basement	Lack of overland flow route from year yard swale out to street or storm sewer. Likely caused by pool installs and grading changes in yards.	Moderate	No	
Glebemount Cr	Surface	Single	3/1/2019	flooded backyard and basement	Thaw or rain, and all the water from the park behind our house	High	No	
McDonnel St	Ground water	Single	10/1/2018	water coming through the floor of the basement.		Low	No	
Brock St	Surface	Single	7/1/2004	flooded the basement. Approximately 18 inches of water	floor drain, walls, windows	Moderate	No	
Gilmour St.	Surface	Single	1/1/2008	basement flooding	no longer an issue basement dug out sump pump installed	Low	Yes	Homeowner installed sump pump that fixed issue.
Stewart Dr.	Surface	Single	1/1/2013	sewers backed up and flooded their lawn	catch basin clogged and not maintained.	Moderate	No	
Stewart St	Surface	Single	10/19/2019	Basement flooding 2-20 mm		Moderate	No	
Crestwood Avenue	Surface	Ongoing	8/3/2023	Overland flow comes down from Ridgewood Rd, overtops curb and flows onto property.	Property is well below grade at the bottom of a hill.	High	No	
Kawartha Heights Blvd.	Surface	Ongoing	8/3/2023	Flow spills over road during extreme rainfall, flooding property and draining through towards Beechwood.	Blocked inlet combined with lack of an adequate overland flow route to direct flow through valley.	High	No	
Kawartha Heights Blvd.	Surface	Ongoing	8/3/2023	Flow spills over road during extreme rainfall, flooding property and draining through towards Beechwood.	Blocked inlet combined with lack of an adequate overland flow route to direct flow through valley.	High	No	

Chamberlain St	Surface	Single	8/3/2023	Street flooded; surface water came to the height of the door, water coming into house	large amounts of rainfall	Moderate	No	
Perry St	Surface	Single	8/3/2023	water overflowing from catch basins.	catch basins clogged.	Low	No	
Ireland Dr	Surface	Single	8/3/2023	Water above the heights of the curb running over lawns towards houses.	large storm	Low	No	
Nevin Ave	Surface	Single	8/3/2023	Water backing up through catch basins	large storm	Low	No	
Louden Terrace	Surface	Single	8/3/2023	Water flowing over road spread trash everywhere	large storm	Low	No	
Sherbrooke St	Surface	Single	8/3/2023	Sherbrooke St flooded with water apartment buildings starting to flood	large storm	High	No	
Chamberlain St	Surface	Single	8/3/2023	Severe flooding	large storm	Moderate	No	
Ireland Dr	Surface	Single	8/3/2023	Flooding	Large Storm	Low	No	
Sherbrooke and Wallis	Surface	Single	8/3/2023	Flooding	Large Storm	Low	No	
The Kingsway and Erskine Ave	Surface	Single	8/3/2023	Flow depths on road resulted in vehicles getting stuck.	Large Storm	High	No	
Chamberlain St	Surface	Single	8/3/2023	Flooding	Large Storm	Moderate	No	
Rose Ave	Surface	Single	8/3/2023	Flooded	Large Storm	Moderate	No	
Princess St	Surface	Single	8/3/2023	Front yard flooded up to the house	Large storm			
Lansdowne St W and Aylmer St S	Surface	Single	8/3/2023	Flooded	Large Storm	Low		
Sherbrooke St and Goodfellow Rd	Surface	Single	8/3/2023	Flooded	Large Storm	Moderate	No	
O'Connell Rd	Surface	Single	8/3/2023	Flooded	Large Storm	Moderate	No	
Bolivar	Surface	Single	8/3/2023	Street is flooded	Large storm event	Moderate	No	
Whitefeild	Surface	Single	8/3/2023	Flooded	Large Storm	Moderate	No	

Mark St	Surface	Single	8/3/2023	Catch basins plugged causing flooding.	Large Storm event	Moderate	No	
Chamberlain St.	Surface	Single	8/3/2023	flooded	large storm	Moderate	No	
Police Station	Surface	Single	8/3/2023	Need help to get water down to move cruisers.	Poor drainage with no outlet. Parking garage lower than street and flows from street enter parking area.	High	No	
Hamilton	Surface	Single	8/3/2023	Road is flooded	Large Rainfall	Moderate		
Brown	Surface	Single	8/3/2023	Road is flooded	Large Storm	Moderate	No	
Park St N	Surface	Single	8/3/2023	Road is flooded	Large Storm	Moderate	No	
King st	Surface	Single	8/3/2023	Water surcharging Manhole taking the cover off	Large storm event	Moderate	No	
Parkway and Lansdowne	Surface	Single	8/3/2023	Flooding	Large Storm	Moderate	No	
Clonsilla and the Parkway	Surface	Single	8/3/2023	Flooding	Large Storm	Moderate	No	
Clonsilla	Surface	Single	8/3/2023	Flooding	Large Storm	Low	No	
Lansdowne and Goodfellow	Surface	Single	8/3/2023	Flooding	Large Storm	Moderate	No	
Parkway and Kingsway	Surface	Single	8/3/2023	Flooding	Large Storm	Moderate	No	
Lansdowne and Rye	Surface	Single	8/3/2023	Flooding	Large storm	Low	No	
Hamilton St	Surface	Single	8/3/2023	Flooded	Large storm	Moderate	No	
Hamilton St	Surface	Single	8/3/2023	Flooded	Large Storm	Moderate	No	
George St and Westcott	Surface	Single	8/3/2023	Water Flooding streets and catch basins are not clogged.	Large Rainfall event	Moderate	No	
Little St	Surface	Single	8/3/2023	Road Flooded	Large Storm	Low	No	
Oconnell	Surface	Single	8/3/2023	Road is Flooded	Large Rainfall	Moderate	No	
Ridgewood Rd	Surface	Single	8/3/2023	Flooded	Large Rainfall	Low	No	
King St	Surface	Single	8/3/2023	Manhole cover came off due to surcharging manhole	Large Storm	Moderate	No	

Avery ave	Surface	Single	8/3/2023	Retention ponds across the road are full and not draining.	Large rainfall	Low	No	
Prince St	Surface	Single	8/3/2023	Flooding on the road	Large Storm	Moderate	No	
Ferndale Ave	Surface	Single	8/3/2023	All of road flooded	Large Rainfall	Moderate	No	
Golfview	Surface	Single	8/3/2023	Road Flooded	Large Storm	Moderate	No	
Neil Dr	Surface	Single	8/3/2023	Road flood during heavy rainfall.	Culverts partially blocked and drainage channel next to Neil Dr. needs to be maintained.	Moderate	No	
Glenmeade Road	Surface	Ongoing	10/13/2023	Basement flood and water ponding on rear yard.	Poor drainage in the area and no overland flow route.	Moderate	No	

10.1 – Abnormal Spills and Discharge Events

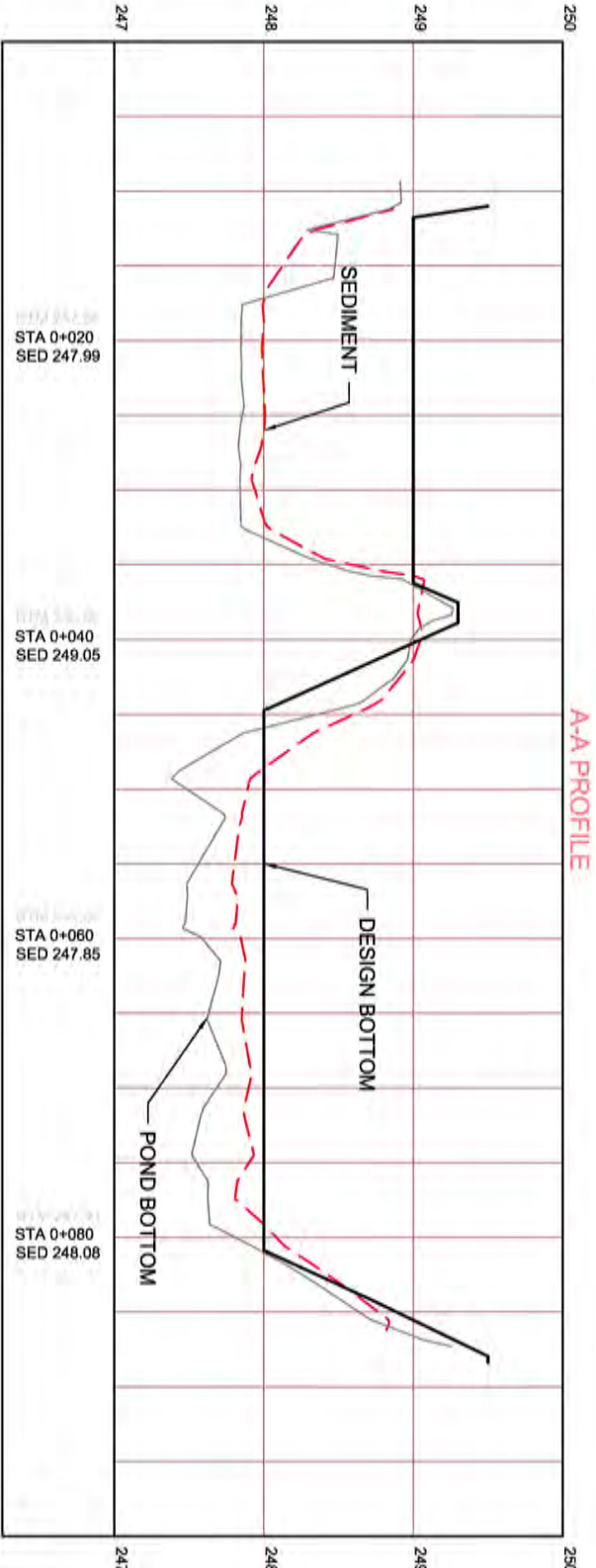
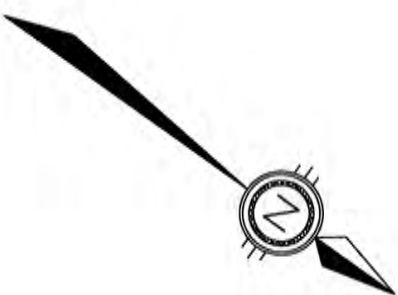
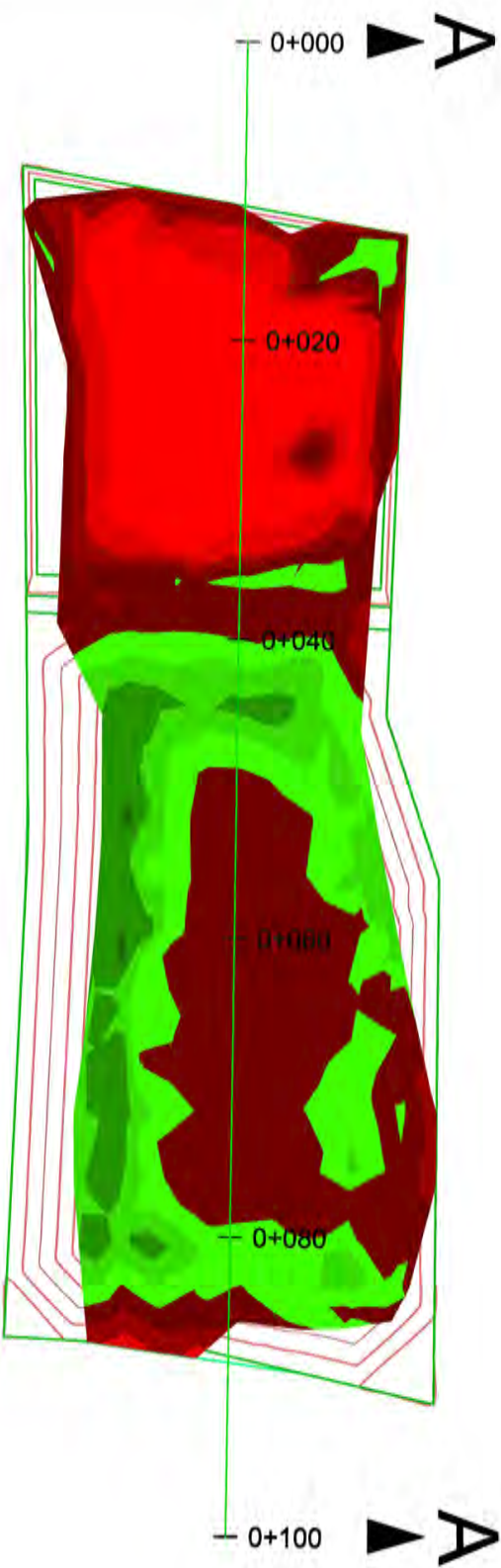
The City's Environmental Protection Services Department manages and reports on Abnormal spills and discharge events. The table below summarizes these events for 2023.

Table 7.0: Summary of Spills and Abnormal Discharge Events

Address/Asset	Date	Comments
ROGERS ST	3-Mar-23	Recycling Truck blew a hydraulic line on Fri Feb 24/2023. Clean up and notification to SAC was made by Emterra. With warm weather over the weekend material that was missed in initial clean up mobilized and entered storm sewer. City staff responded on Sun Feb. 26 2023 to perform further clean up. Emterra agreed to monitor the site regularly through the spring thaw in case further material became evident during the thaw.
RINK ST	13-Apr-23	Mutiple complaints Regarding blowing styrofoam from the construction site at Rink Street. Small pieces of styrofoam getting into the storm sewer. Clean up was performed by contactors responsible .
GEORGE ST N	20-Apr-23	Staff noticed wash water had been discharged curbside on their way into work. Business was notified that this practice was unacceptable.
PARK ST S	12-Jun-23	Light and sporadic hydrocarbon sheen reported a storm out fall during heavy rainfall event. Staff were unable to determine a source during their investigation.
CHEMONG RD	12-Jun-23	Drain in the car wash bay was plugged and wash water was flowing overland na into the storm sewer sytem. Business owner was notified and carwash was taken out of service until repairs to the drains were made.
CREEKWOOD DR	2-Aug-23	Recycling truck blew a hydraulic line lost approximatley 100 L of hydraulic oil. 1-2 L entered a CB but was contained in the CB. Clean up by a third party contractor was co-ordinated by the recycling company.
GEORGE ST N	23-Aug-23	Improperly maintained grease trap resulted in basement flooding at a restaurant. Third party contractor was pumping sewage from basement to curbside. Were istructed to stop and city vacuum truck was deployed to clean out CB's.

Townsend	Ongoing	Contamination from the transit yard has been leaking in to the new storm culvert on Townsend St. The city has been working with a consultant to control and prevent this contamination from entering the culvert. Work on this is ongoing but the last appearance of sheen beyond control measures was September 2023.
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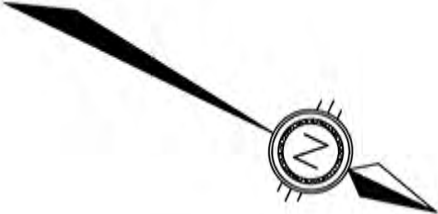
Appendix A: Sediment Survey Drawings



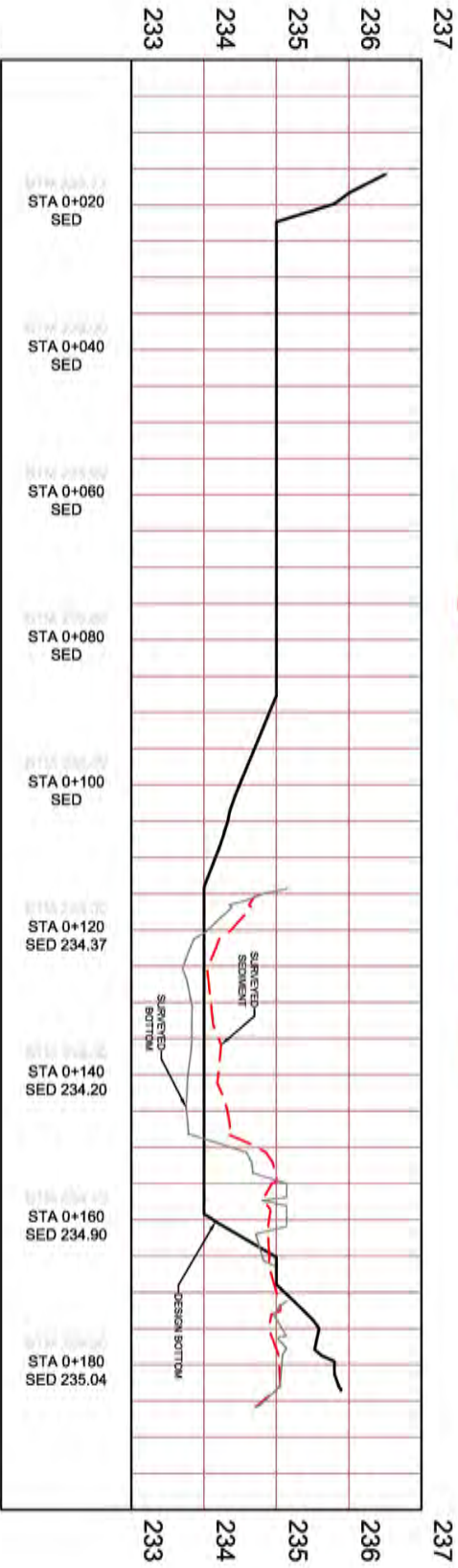
Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.20	-0.90	283.05	<div></div>
2	-0.90	-0.60	115.36	<div></div>
3	-0.60	-0.30	110.66	<div></div>
4	-0.30	0.00	547.52	<div></div>
5	0.00	0.30	295.34	<div></div>
6	0.30	0.60	162.65	<div></div>
7	0.60	0.90	105.97	<div></div>
8	0.90	1.20	2.02	<div></div>



Chemong Park Plaza Pond		POND NUMBER: 9	N/A
		C.M.	CONTRACT NUMBER: X.X.X.
		DRAWN BY: AUG. 12, 2021	REVIEWED BY:
		DATE:	SCALE: 1:500



College Park A-A PROFILE



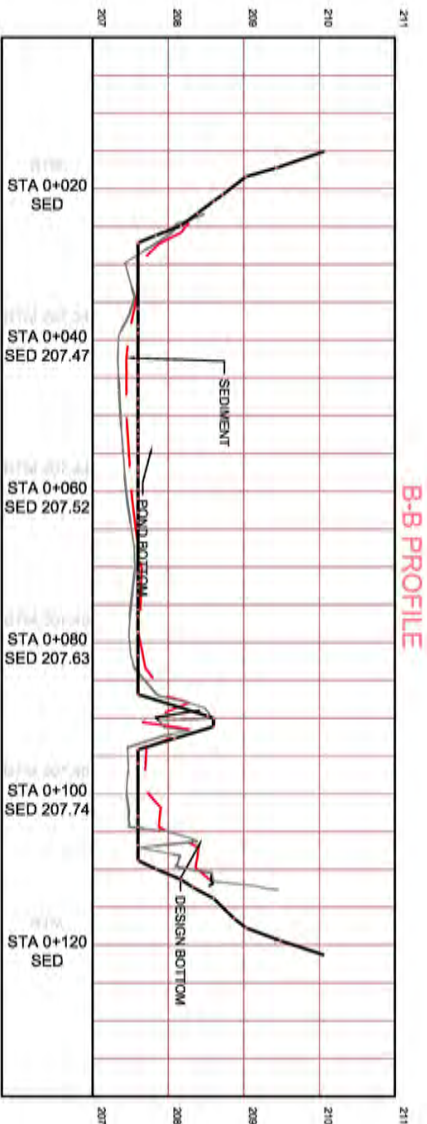
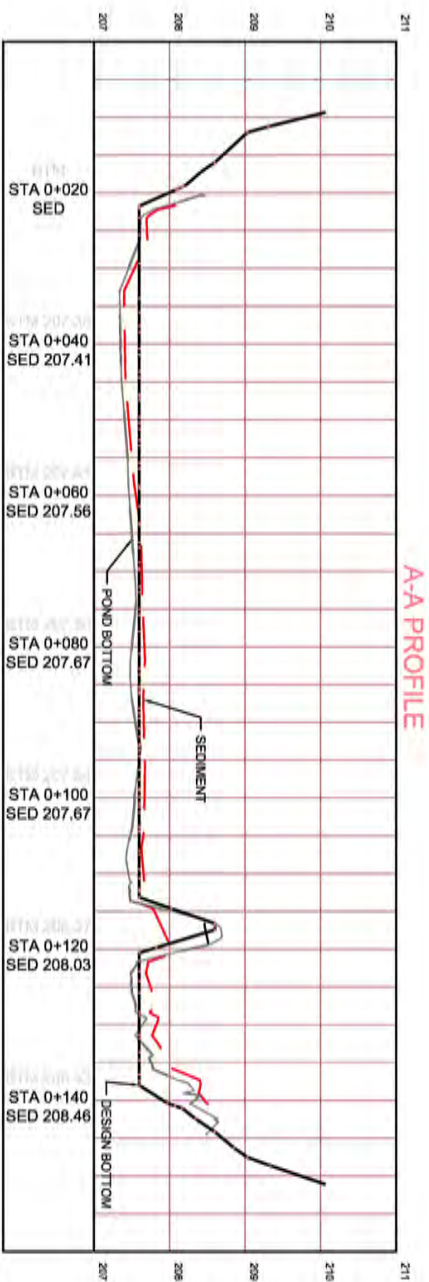
Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-2.10	-1.80	0.81	Red
2	-1.80	-1.50	14.62	Red
3	-1.50	-1.20	26.74	Red
4	-1.20	-0.90	38.63	Red
5	-0.90	-0.60	147.33	Red
6	-0.60	-0.30	122.35	Red
7	-0.30	0.00	217.78	Red
8	0.00	0.30	685.77	Red
9	0.30	0.60	345.03	Red
10	0.60	0.90	121.40	Red
11	0.90	1.20	44.13	Red



College Park Pond

27	N/A
POND NUMBER:	CONTRACT NUMBER
C.M.	X.X.X.
DRAWN BY:	REVIEWED BY:
AUG. 12, 2021	1:1000
DATE:	SCALE:



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Area
1	-1.50	-1.20	2.47
2	-1.20	-0.90	94.11
3	-0.90	-0.60	166.33
4	-0.60	-0.30	159.39
5	-0.30	0.00	1255.91
6	0.00	0.30	1439.12
7	0.30	0.60	289.58
8	0.60	0.90	91.19



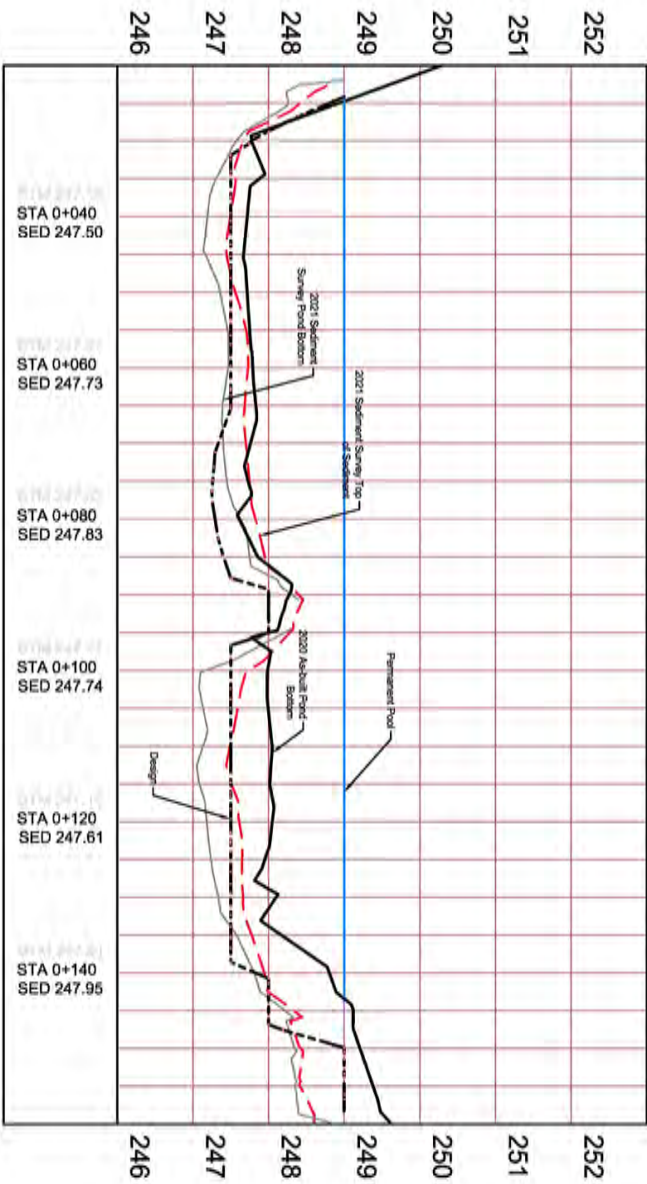
Cunningham Pond		POND NUMBER: 3	N/A
		DRAWN BY: C.M.	CONTRACT NUMBER
		DATE: AUG. 12, 2021	REVIEWED BY: X.X.X.
			SCALE: 1:1000



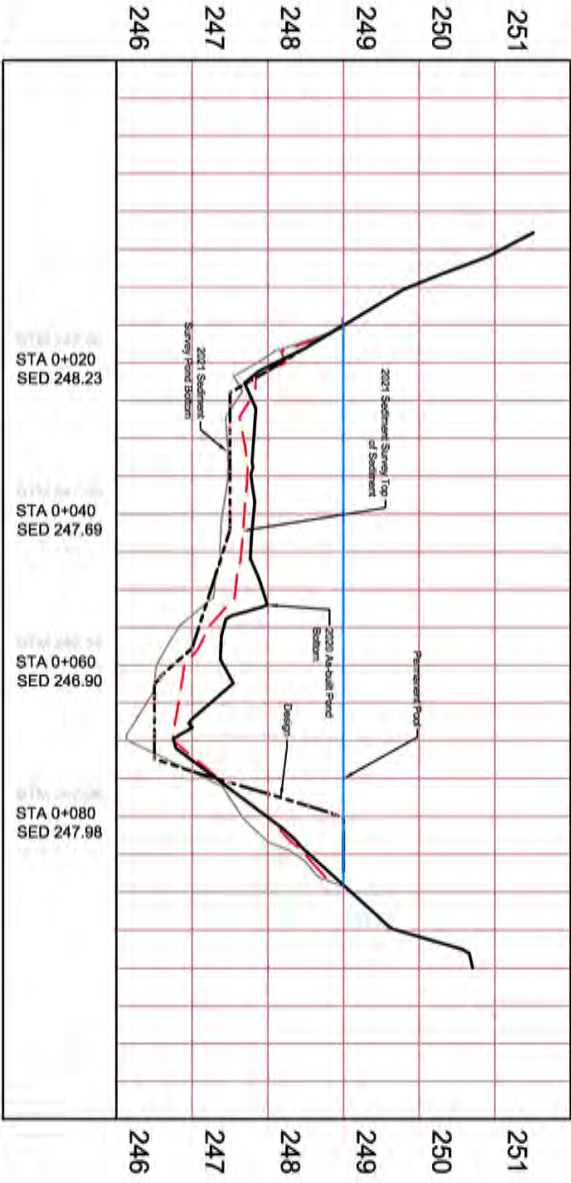
Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.20	-0.90	5.09	
2	-0.90	-0.60	29.61	
3	-0.60	-0.30	182.95	
4	-0.30	0.00	366.50	
5	0.00	0.30	678.94	
6	0.30	0.60	1465.56	
7	0.60	0.90	537.04	
8	0.90	1.20	161.75	
9	1.20	1.50	9.41	
10	1.50	1.80	1.12	



Fairview A-A PROFILE



Fairview B-B PROFILE

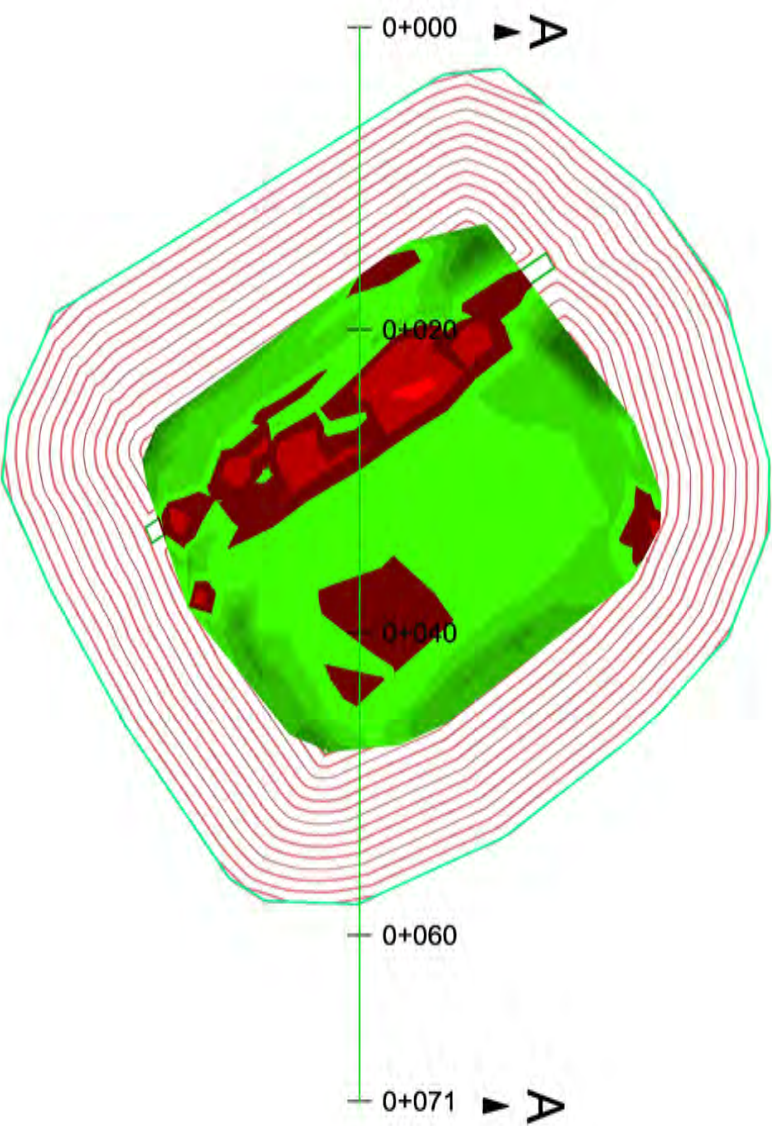


Fairview Estates Pond

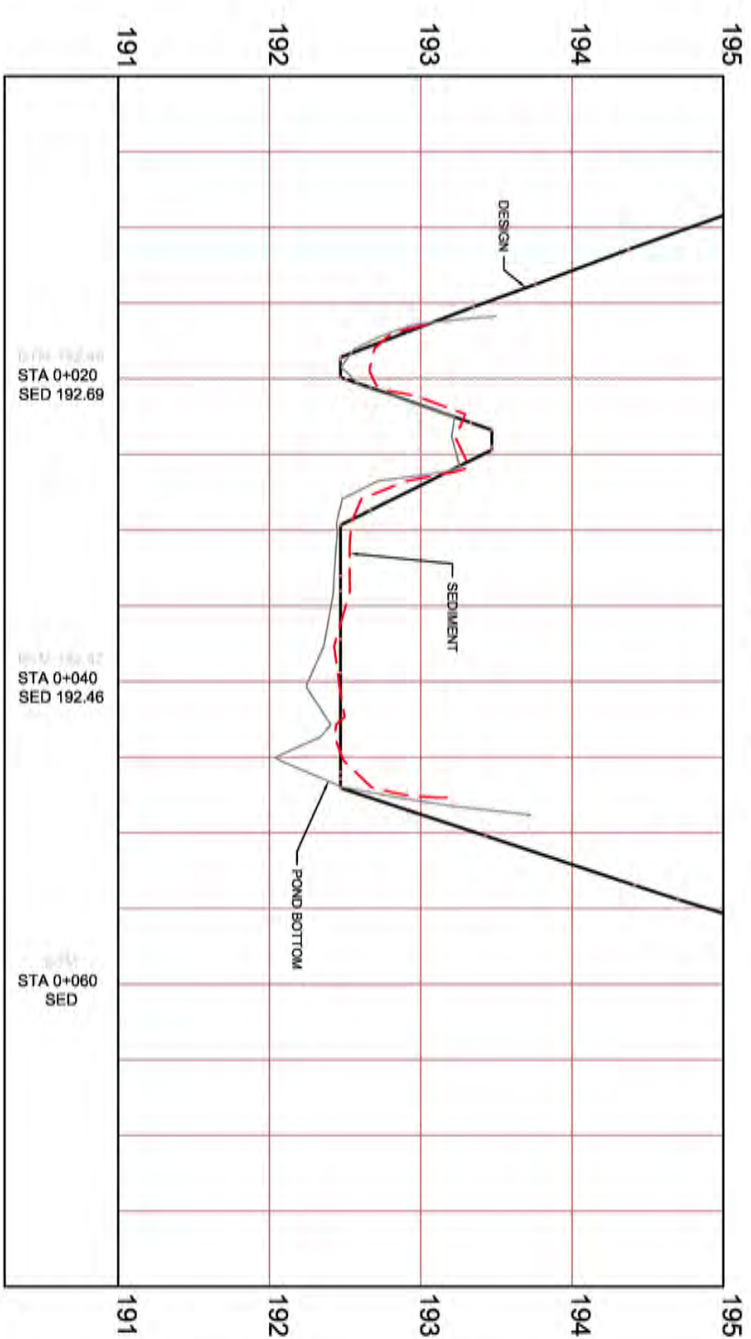
POND NUMBER:	17	CONTRACT NUMBER:	N/A
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DRAWN BY:	C.M.	REVIEWED BY:	X.X.X.
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DATE:	AUG. 12, 2021	SCALE:	1:1000
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A-A PROFILE

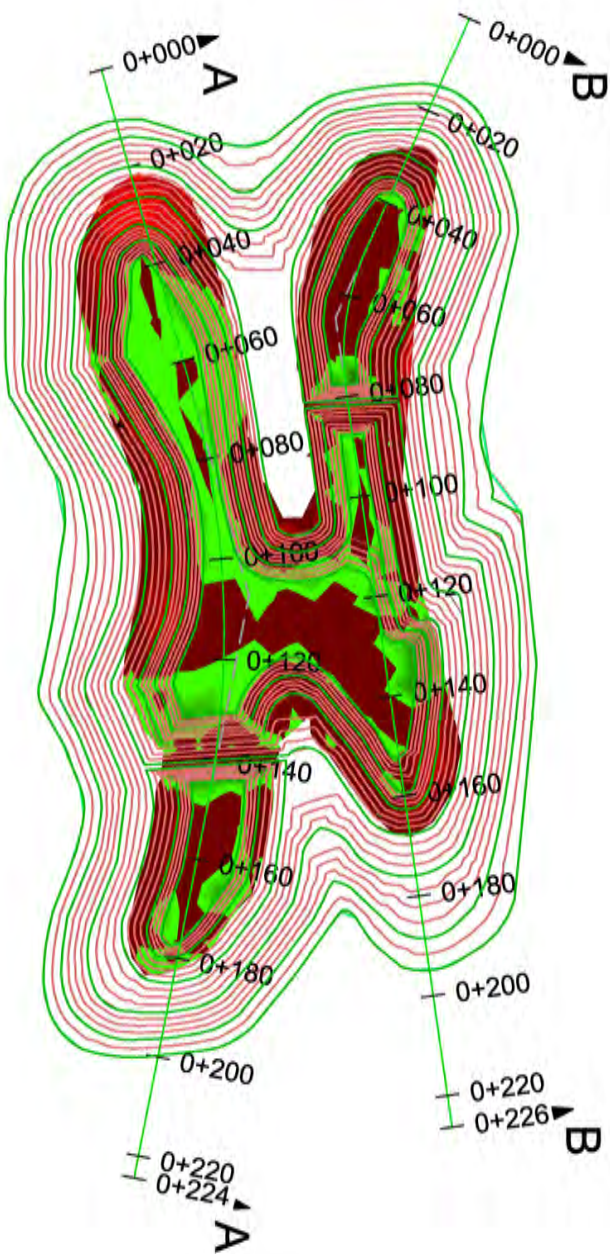


Elevations Table

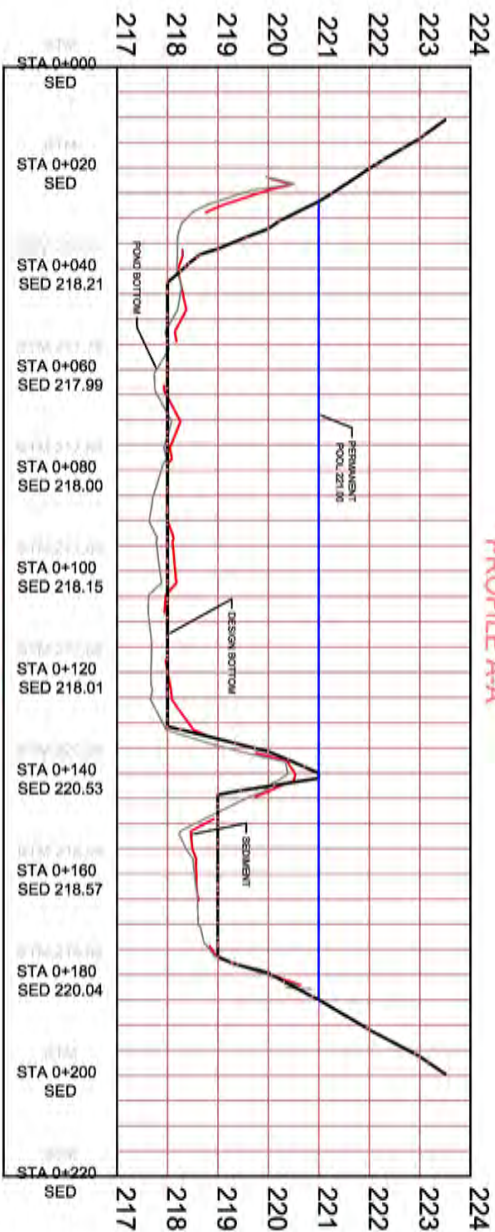
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-0.60	-0.40	2.52	
2	-0.40	-0.20	45.71	
3	-0.20	0.00	141.74	
4	0.00	0.20	341.49	
5	0.20	0.40	153.96	
6	0.40	0.60	66.24	
7	0.60	0.80	18.24	
8	0.80	1.00	7.17	



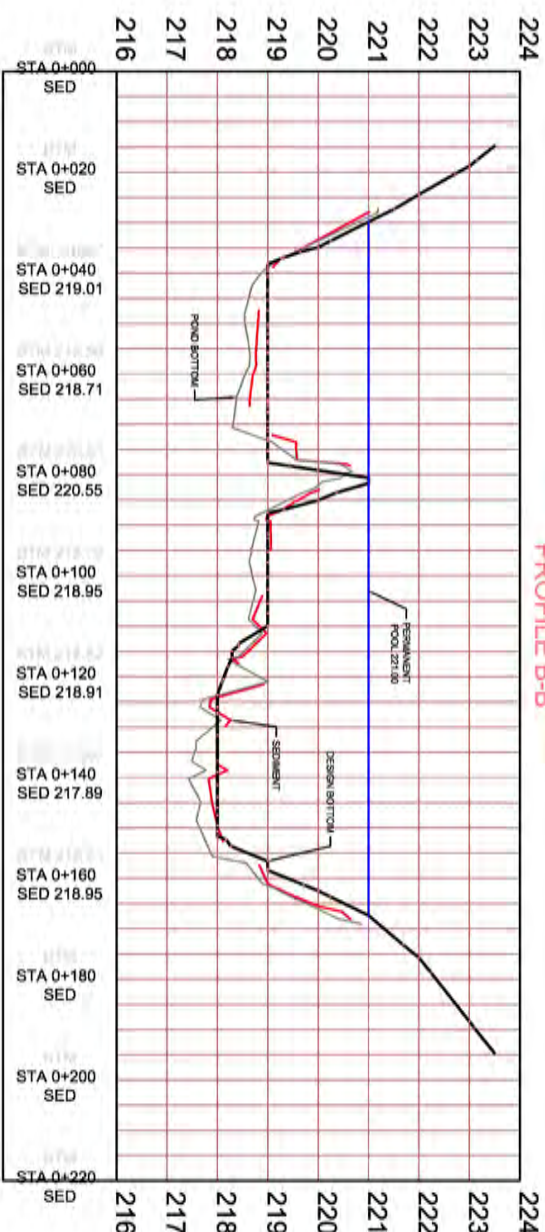
Foxmeadow Pond		15	N/A
POND NUMBER:		C.M.	CONTRACT NUMBER
DRAWN BY:		AUG 12, 2021	REVIEWED BY:
DATE:		SCALE: 1:500	



PROFILE A-A



PROFILE B-B

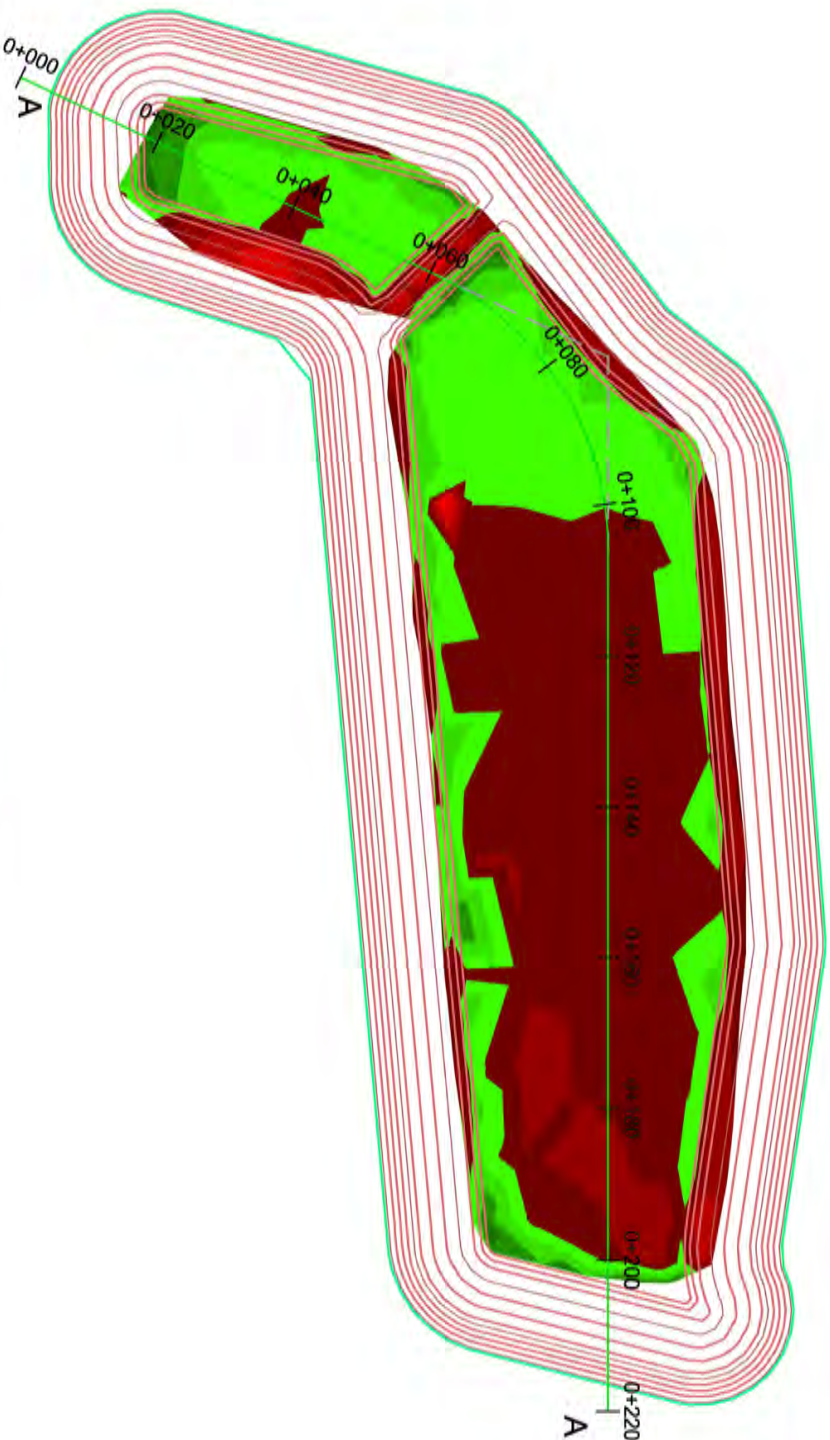


Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-2.10	-1.80	6.48	
2	-1.80	-1.50	52.10	
3	-1.50	-1.20	94.11	
4	-1.20	-0.90	215.78	
5	-0.90	-0.60	617.13	
6	-0.60	-0.30	1471.12	
7	-0.30	0.00	2442.37	
8	0.00	0.30	1662.07	
9	0.30	0.60	413.93	
10	0.60	0.90	131.08	
11	0.90	1.20	58.14	
12	1.20	1.50	4.98	
13	1.50	1.80	1.45	

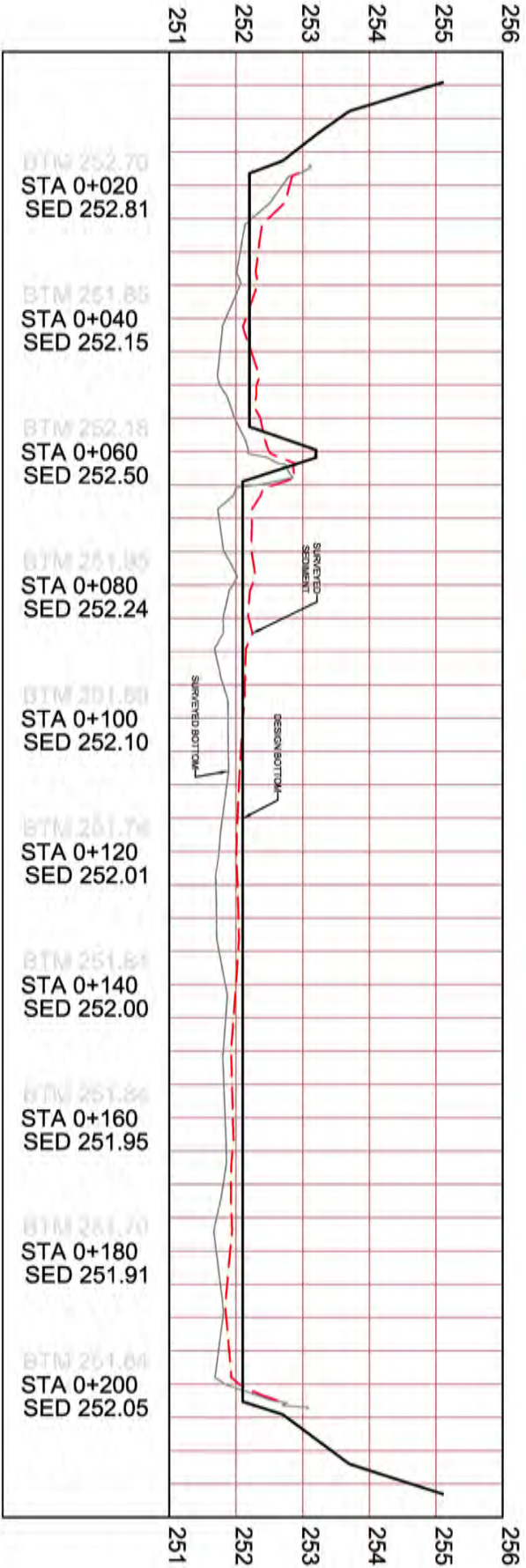


Heritage Park Pond

2		N/A	
POND NUMBER:		CONTRACT NUMBER:	
C.M.		X.X.X.	
DRAWN BY:		REVIEWED BY:	
AUG. 12, 2021		1:1500	
DATE:		SCALE:	



Loggerhead 1 PROFILE



Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.00	-0.80	0.96	Red
2	-0.80	-0.60	35.09	Red
3	-0.60	-0.40	110.75	Red
4	-0.40	-0.20	598.09	Red
5	-0.20	0.00	2746.22	Red
6	0.00	0.20	1710.06	Red
7	0.20	0.40	418.00	Red
8	0.40	0.60	123.76	Red
9	0.60	0.80	25.74	Red

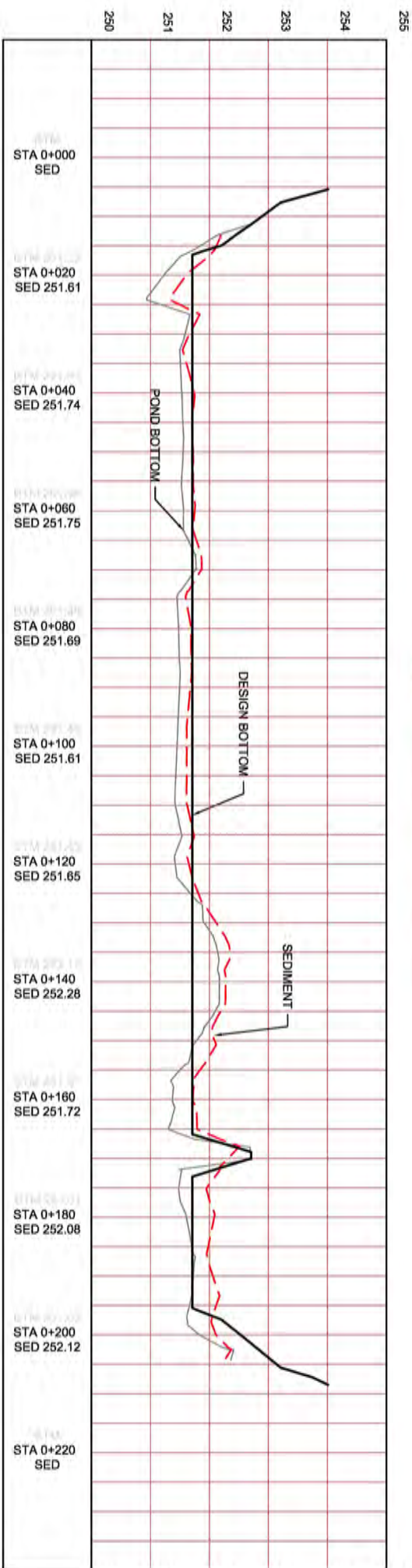


Loggerhead 1 Pond

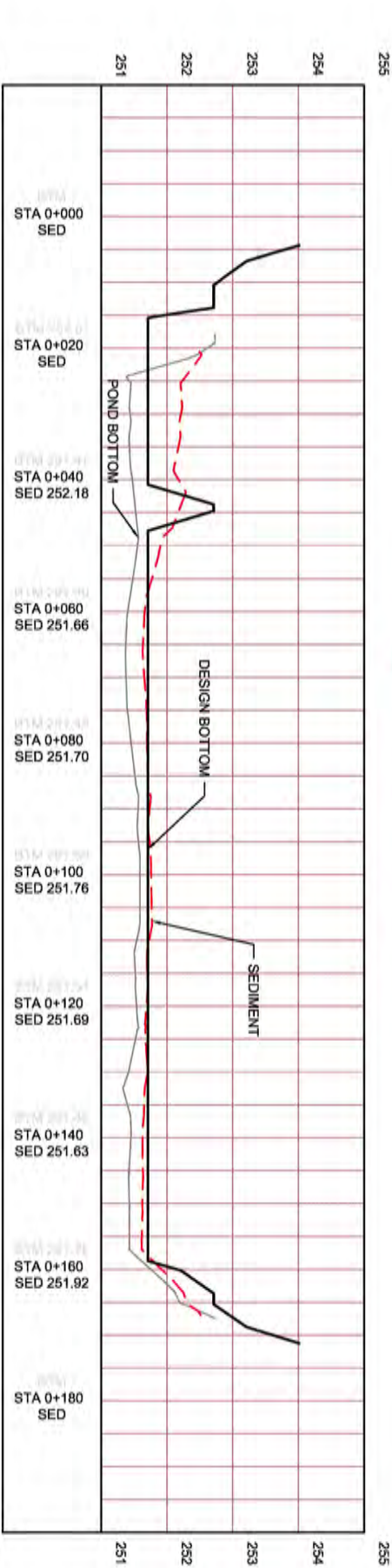
19	N/A
POND NUMBER:	CONTRACT NUMBER
C.M.	X.X.X.
DRAWN BY:	REVIEWED BY:
AUG. 12, 2021	1:1000
DATE:	SCALE:



Loggerhead 2 A-A PROFILE



Loggerhead 2 B-B PROFILE



Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-2.70	-2.40	0.34	
2	-2.40	-2.10	17.09	
3	-2.10	-1.80	60.46	
4	-1.80	-1.50	98.15	
5	-1.50	-1.20	121.52	
6	-1.20	-0.90	130.09	
7	-0.90	-0.60	332.39	
8	-0.60	-0.30	1925.57	
9	-0.30	0.00	2387.57	
10	0.00	0.30	1945.49	
11	0.30	0.60	615.13	
12	0.60	0.90	164.38	



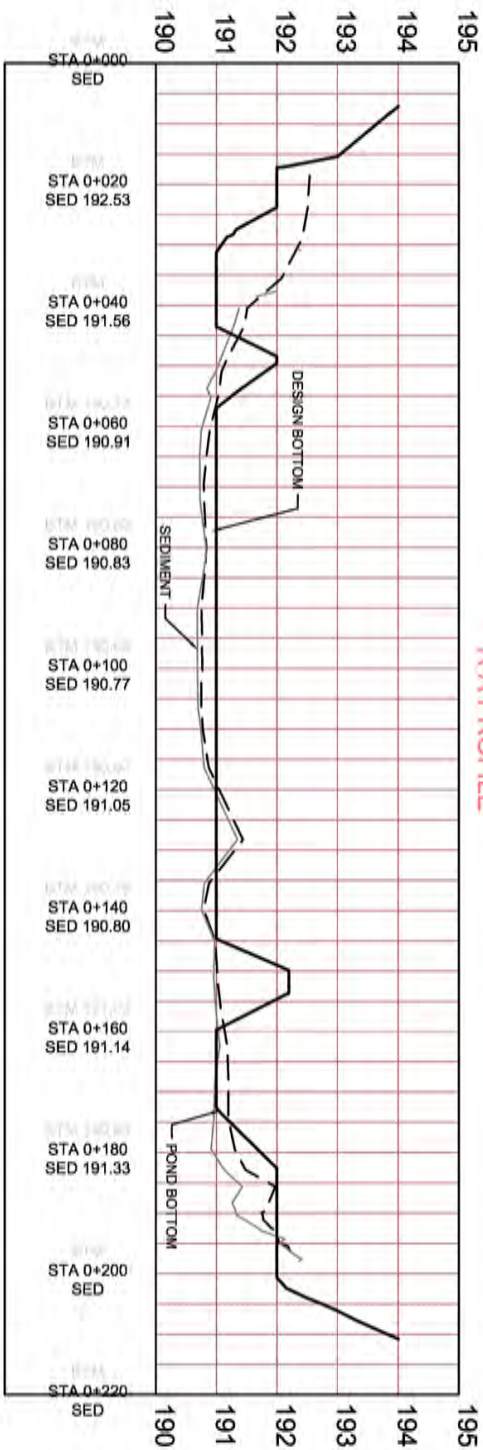
NOTE: LOGGERHEAD 2 POND WAS BUILT WITH THE EAST FOREBAY FURTHER EAST AND LARGER THAN DESIGN. ELEVATION TABLE IS COMPARING SURVEYED BOTTOM OF POND TO SURVEYED TOP OF SEDIMENT.



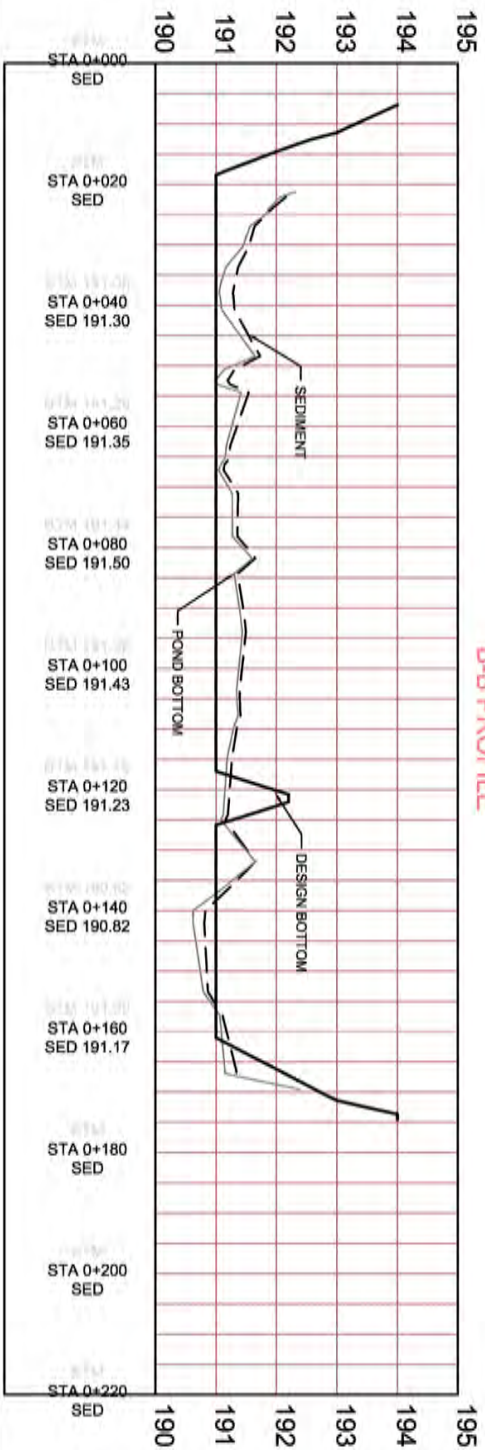
Loggerhead 2 Pond	
POND NUMBER: 18	CONTRACT NUMBER: N/A
DRAWN BY: C.M.	REVIEWED BY: X.X.X.
DATE: AUG. 12, 2021	SCALE: 1:1000



A-A PROFILE



B-B PROFILE



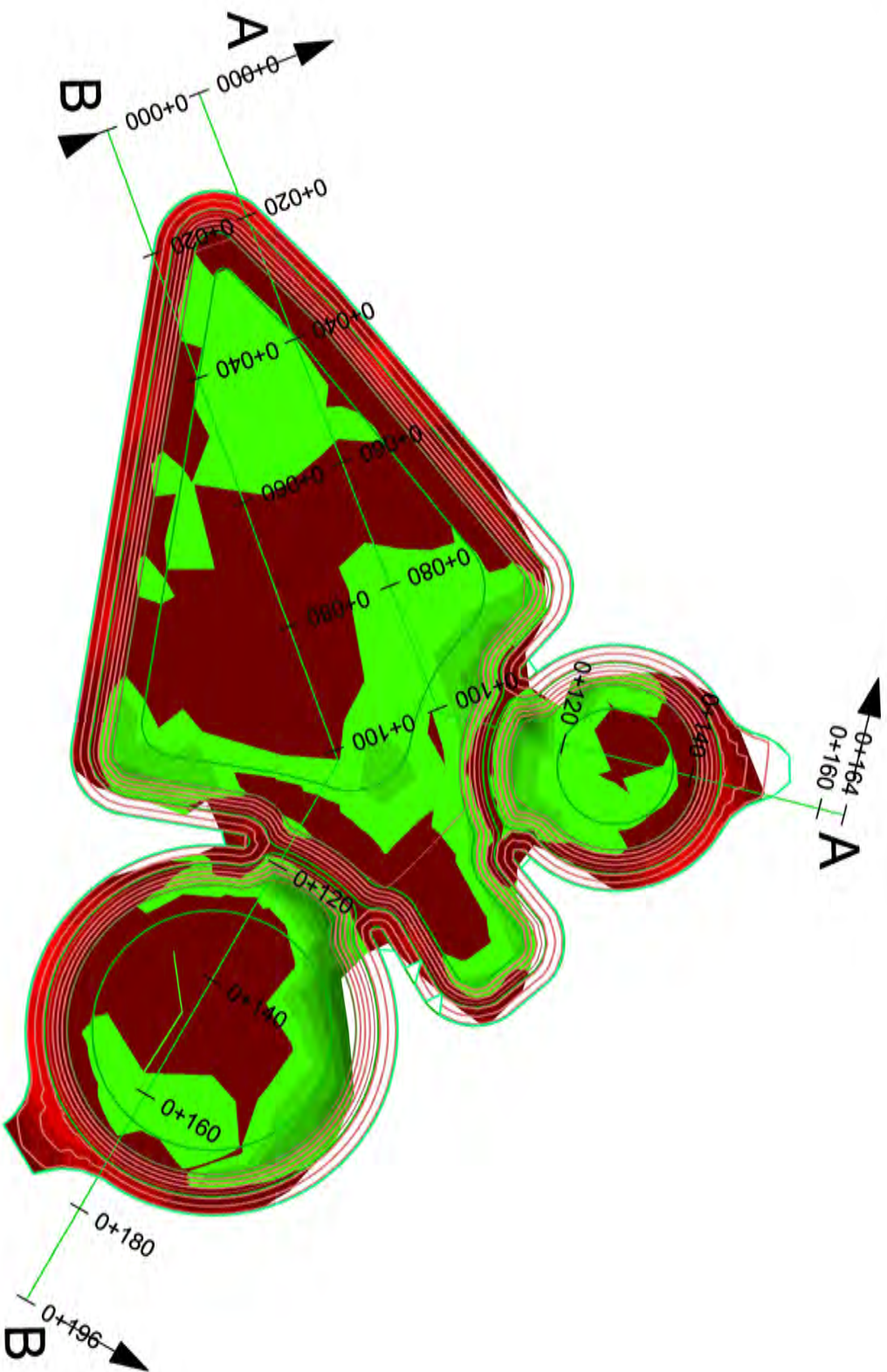
Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.50	-1.20	69.25	Red
2	-1.20	-0.90	308.74	Red
3	-0.90	-0.60	697.95	Red
4	-0.60	-0.30	1046.22	Red
5	-0.30	0.00	4076.16	Red
6	0.00	0.30	2044.66	Red
7	0.30	0.60	1031.84	Red
8	0.60	0.90	303.35	Red
9	0.90	1.20	49.05	Red
10	1.20	1.50	9.20	Red

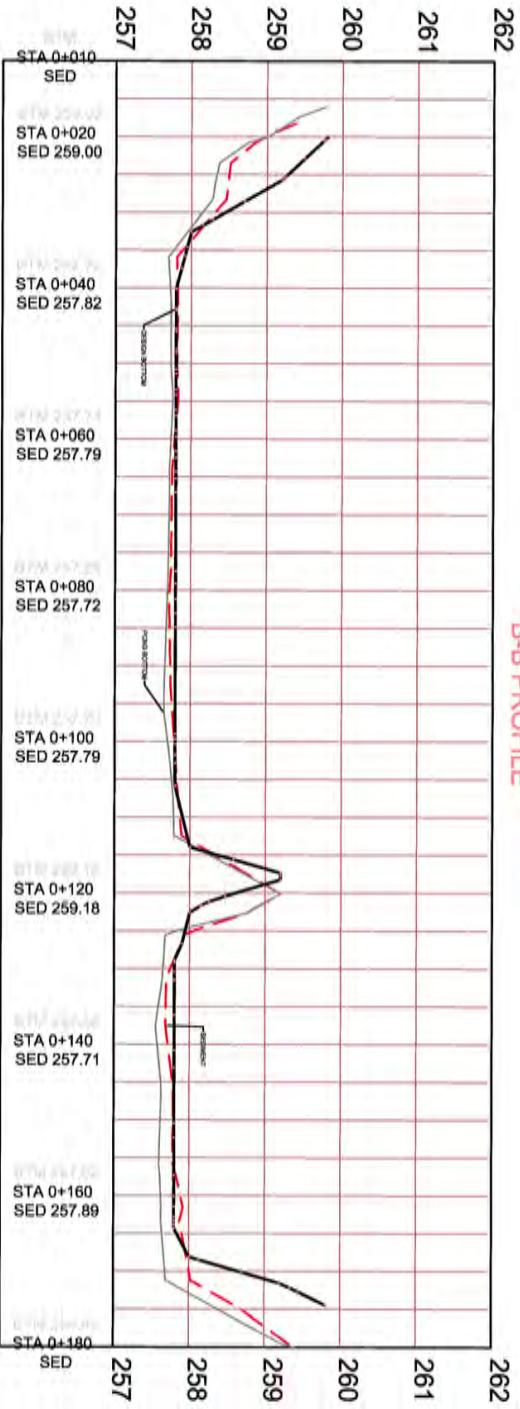
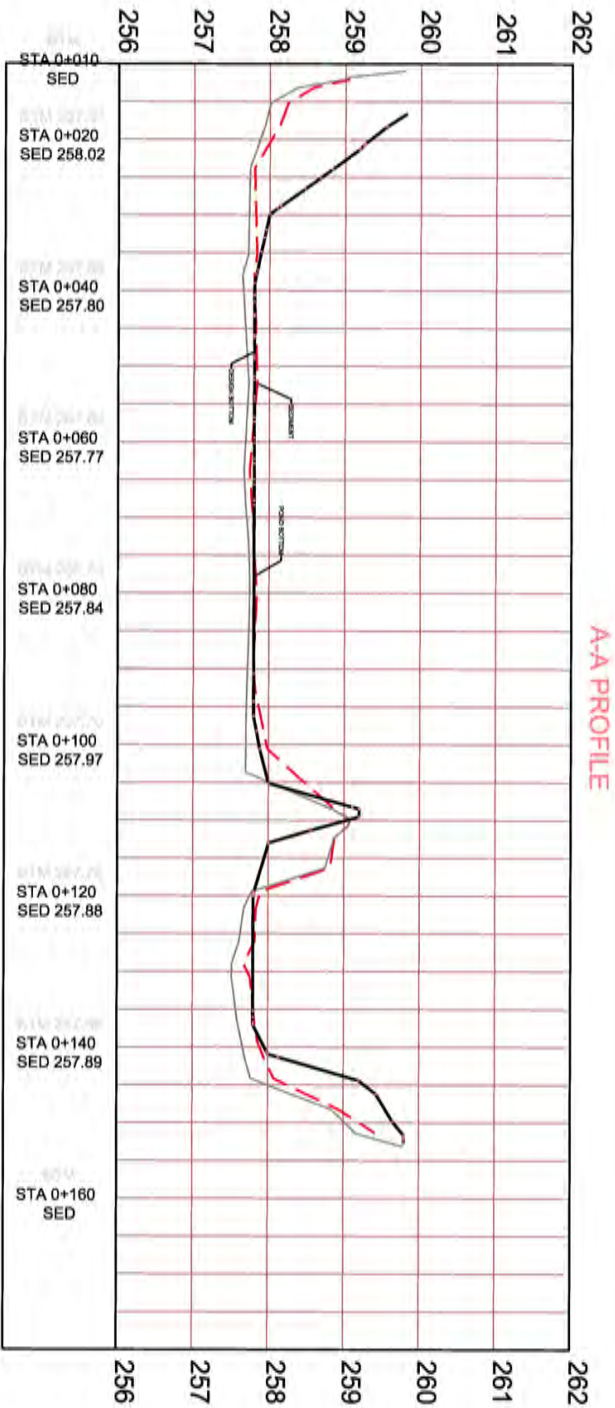


Major Bennett Pond

29	N/A
POND NUMBER:	CONTRACT NUMBER
C.M.	X.X.X.
DRAWN BY:	REVIEWED BY:
AUG. 12, 2021	1:1250
DATE:	SCALE:

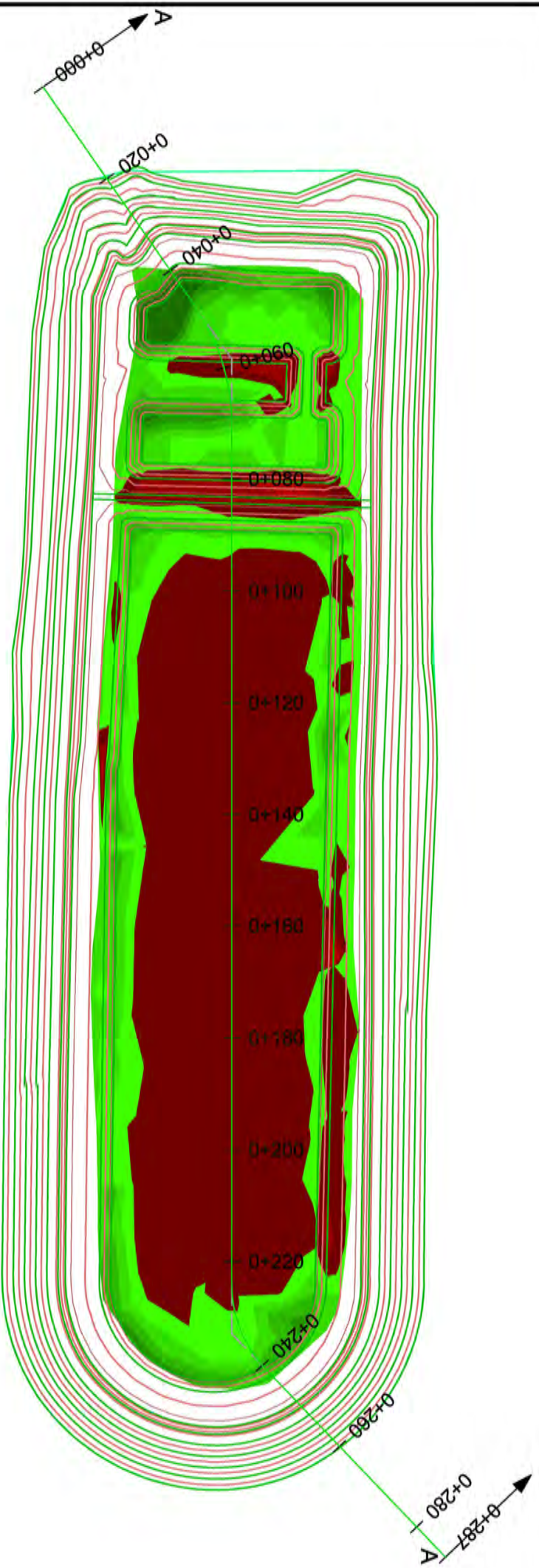


Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-2.10	-1.80	2.66	
2	-1.80	-1.50	48.89	
3	-1.50	-1.20	180.39	
4	-1.20	-0.90	443.93	
5	-0.90	-0.60	539.15	
6	-0.60	-0.30	593.11	
7	-0.30	0.00	3530.05	
8	0.00	0.30	2631.50	
9	0.30	0.60	617.19	
10	0.60	0.90	200.37	
11	0.90	1.20	100.72	
12	1.20	1.50	37.25	

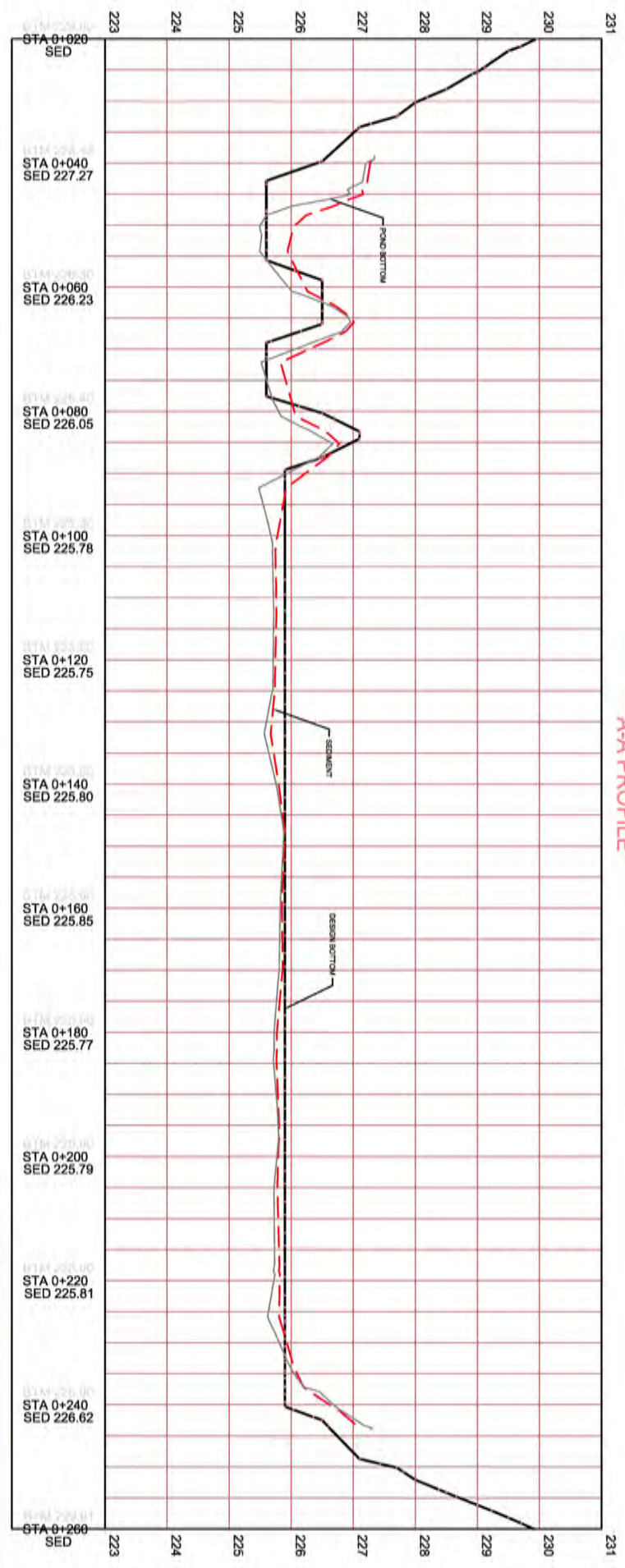


Summerhill Pond

POND NUMBER: 5		CONTRACT NUMBER: N/A	
DRAWN BY: C.M.		REVIEWED BY: X.X.X.	
DATE: AUG. 12, 2021		SCALE: 1:1000	



A-A PROFILE

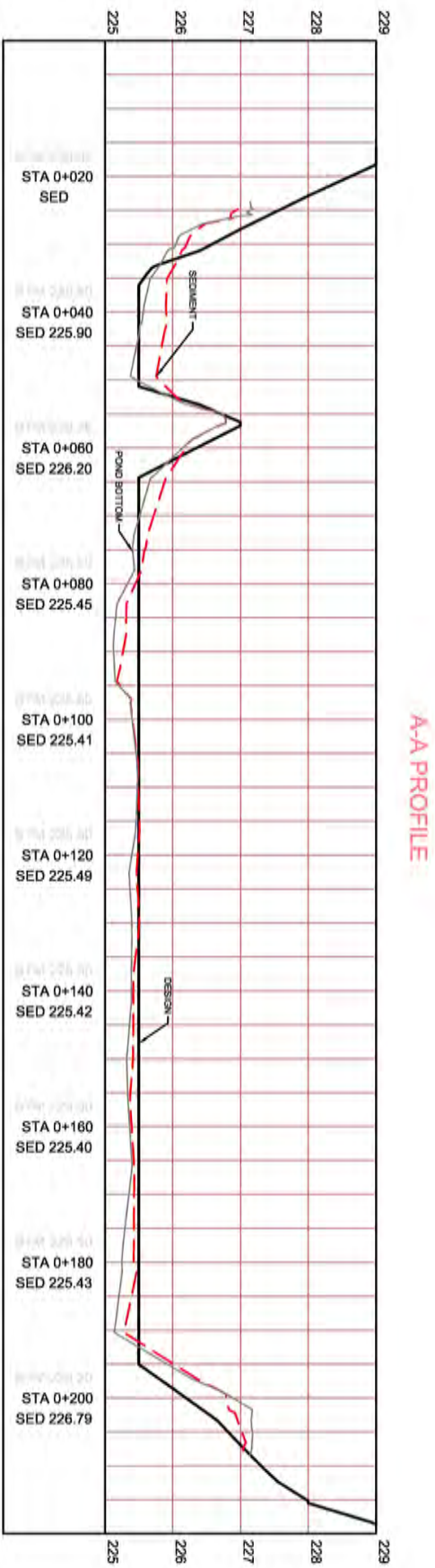
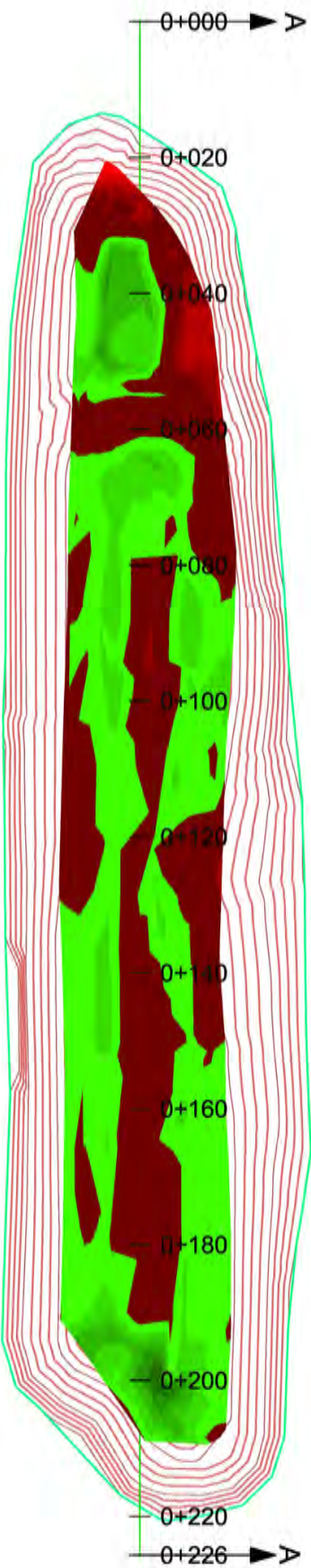


Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.50	-1.20	9.69	Red
2	-1.20	-0.90	77.88	Red
3	-0.90	-0.60	260.92	Red
4	-0.60	-0.30	743.00	Red
5	-0.30	0.00	4609.22	Red
6	0.00	0.30	1144.40	Green
7	0.30	0.60	824.81	Green
8	0.60	0.90	590.91	Green
9	0.90	1.20	315.74	Green
10	1.20	1.50	136.42	Green
11	1.50	1.80	65.34	Green



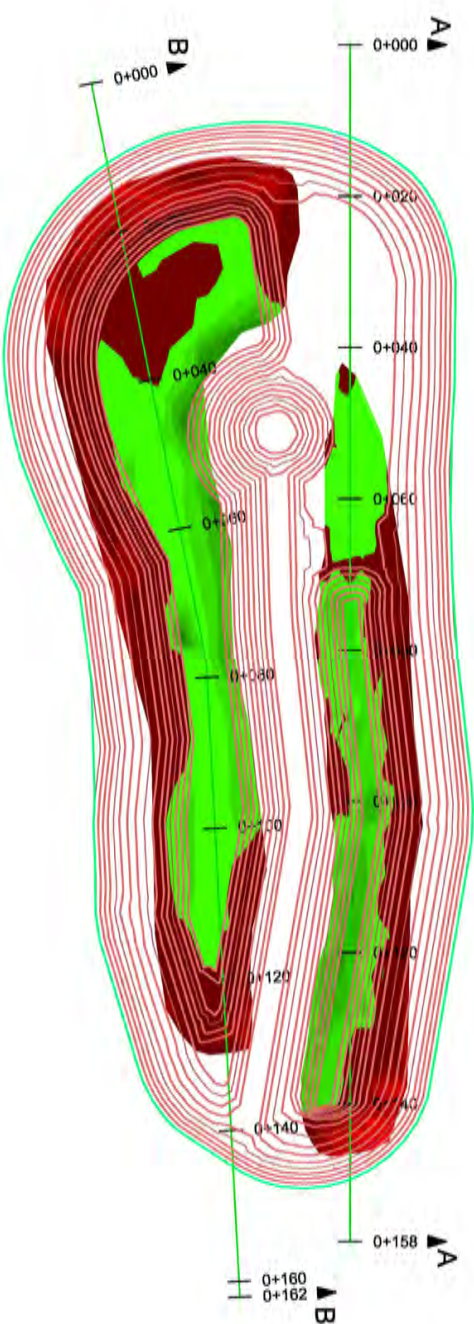
Towerhill North Pond	
POND NUMBER: 6	CONTRACT NUMBER: N/A
C.M.:	X.X.X.
DRAWN BY:	REVIEWED BY:
DATE: AUG. 12, 2021	SCALE: 1:1000

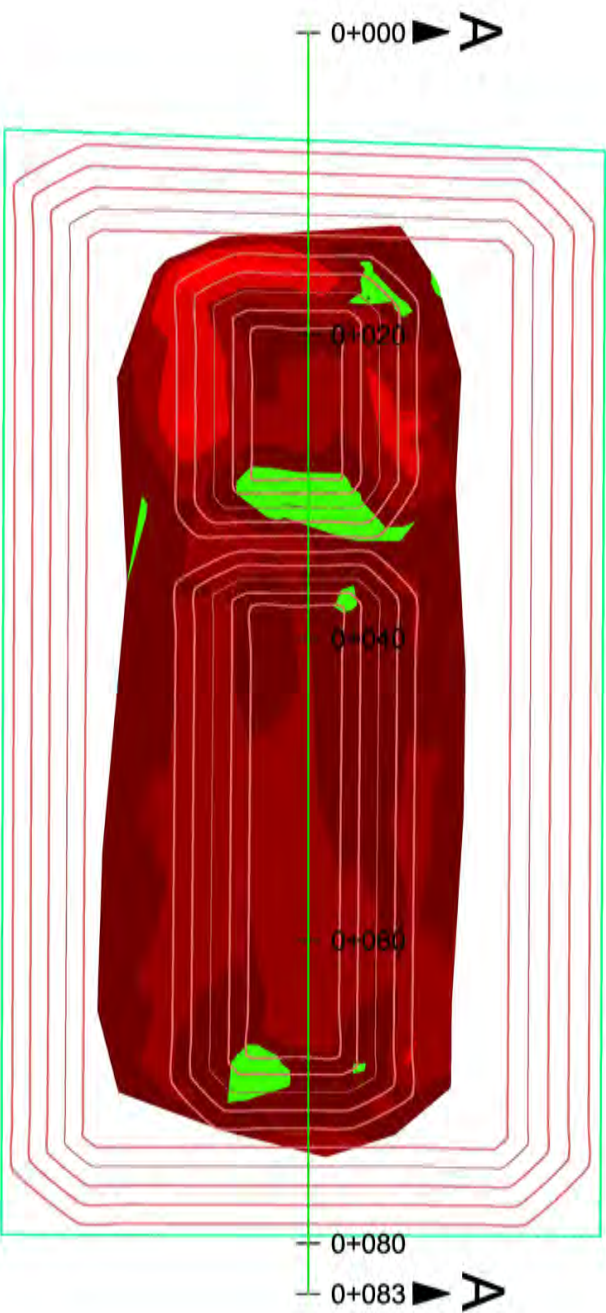


Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-1.20	-1.00	3.42	
2	-1.00	-0.80	5.08	
3	-0.80	-0.60	49.53	
4	-0.60	-0.40	80.75	
5	-0.40	-0.20	297.24	
6	-0.20	0.00	1328.66	
7	0.00	0.20	1698.86	
8	0.20	0.40	482.34	
9	0.40	0.60	154.84	
10	0.60	0.80	28.17	
11	0.80	1.00	7.98	



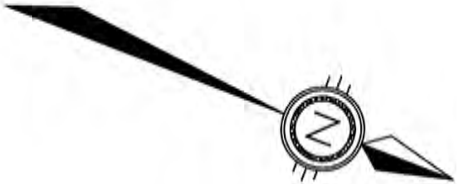
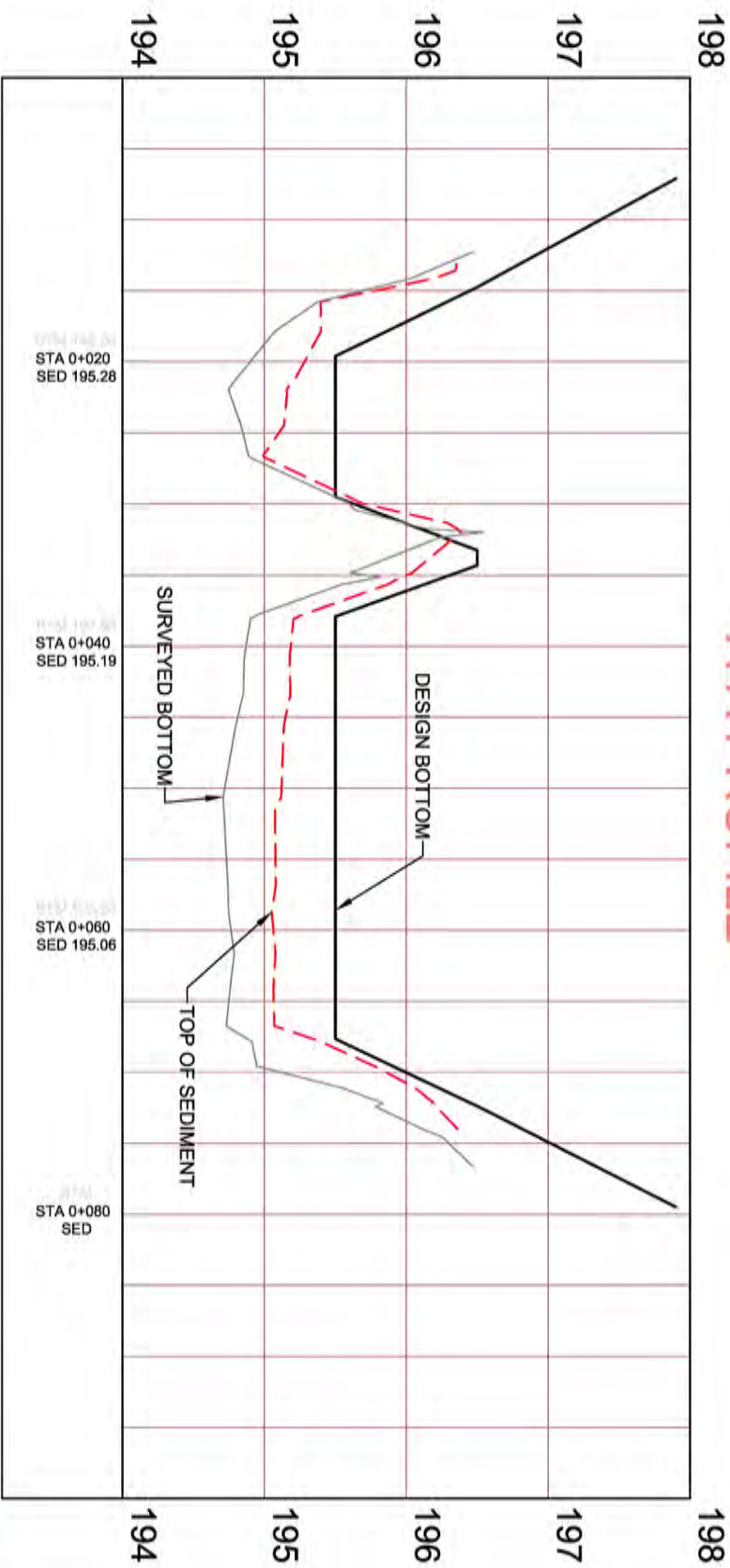
Towerhill South Pond		10	N/A
POND NUMBER:	C.M.	CONTRACT NUMBER	
DRAWN BY:	X.X.X.	REVIEWED BY:	
DATE: AUG. 12, 2021		SCALE: 1:1000	





Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Area
1	-1.20	-0.90	9.91
2	-0.90	-0.60	75.07
3	-0.60	-0.30	561.43
4	-0.30	0.00	621.81
5	0.00	0.30	50.87
6	0.30	0.60	0.10

A-A PROFILE



Wentworth Street Pond	
POND NUMBER: 23	CONTRACT NUMBER: N/A
C.M. DRAWN BY:	X.X.X. REVIEWED BY:
DATE: AUG. 12, 2021	SCALE: 1:500