Item 6A.
BCWMC 5-20-21
Appendices Only

# Medley Park Stormwater Treatment Facility Feasibility Study-DRAFT

## *Golden Valley, Minnesota*

May 2021

Prepared for
Bassett Creek Watershed Management Commission

# Appendices

## (in stand-alone PDF)

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# Appendix A

## Sediment Sampling and Bathymetric Supplementary Information (2020)

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engineering and environmental consultants

BARR

# Technical Memorandum

**To:** Bassett Creek Watershed Management Commission
**From:** Kevin Menken & Katie Turpin-Nagel, Barr Engineering
**Subject:** Medley Pond Sediment Characterization
**Date:** January 26, 2021
**Project:** 23/27-0051.51

## Introduction

This memorandum summarizes sediment characterization for sediment samples and bathymetric measurements collected from Medley Pond in the City of Golden Valley (City).

The purpose of sediment characterization is to determine whether the sediment in the pond, when excavated or dredged, could potentially be reused as fill, or if other management methods (such as landfill disposal) would be required. The use and/or disposal of excavated or dredged material is determined based on concentrations of potential contaminants in the sediments, including metals and polycyclic aromatic hydrocarbons (PAHs). Excavated sediment and soils that do not exceed 100 mg/kg total petroleum hydrocarbons (TPH); and do not exceed the Minnesota Pollution Control Agency's (MPCA) Soil Reference Values (SRV) or applicable Screening Soil Leaching Values (SLVs) may be considered Unregulated Fill that is suitable for off-site reuse, according to the MPCA document *Best Management Practices for the Off-Site Reuse of Unregulated Fill* (MPCA, 2012). Sediment or soil excavated from stormwater ponds with constituents that exceed SRVs or applicable Screening SLVs, or have TPH greater than 100 mg/kg, are often disposed at a solid waste landfill.

## Sediment Sample Collection Methodology

Sediment samples were collected by Barr Engineering Co. (Barr) on October 13, 2020 on behalf of Bassett Creek Watershed Management Commission (BCWMC). Sediment sampling was conducted in accordance with the MPCA's *Managing Stormwater Sediment, Best Management Practice Guidance* (MPCA, 2017). The MPCA guidance document provides technical guidance for characterizing sediment in stormwater ponds, including the number of samples that should be collected and potential contaminants to be analyzed. Barr staff collected two sediment samples, consistent with MPCA guidance recommendations for an excavation area less than 2 acres in size. Barr staff used a 3-inch diameter aluminum tube with vibracoring equipment to collect the sediment cores. A GPS unit was used to record the sediment sampling locations. Sediment samples were placed in containers provided by the laboratory, and sent to Pace Analytical laboratory in Minneapolis for analyses of potential contaminants.

The MPCA guidance for stormwater pond sediment management lists the baseline parameters that should be tested to determine whether excavated sediment is contaminated or could be considered

Unregulated Fill (MPCA, 2017). The baseline parameters listed in the MPCA guidance are arsenic, copper, and polycyclic aromatic hydrocarbons (PAHs). PAHs are organic compounds that are formed by the incomplete combustion of organic materials, such as wood, oil, and coal. They are also naturally occurring in crude oil and coal. The MPCA determined that coal tar-based sealants were the largest source of PAHs to stormwater ponds, and a state-wide ban of coal tar-based sealants took effect January 1, 2014.

Based on Barr's experience with characterizing sediment in stormwater ponds, Barr recommended the following additional parameters be analyzed beyond the baseline parameters: the full list of RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); diesel range organics (DRO); gasoline range organics (GRO); and benzene, toluene, ethylbenzene, and xylene (BTEX). There is not an analytical test directly measuring TPH; therefore, the sum of DRO and GRO are compared to the MPCA's Unregulated Fill threshold value. Field screening was conducted for signs of impacts from petroleum hydrocarbons, such as an oily sheen, petroleum odor, or visible staining. Field staff did not observe oily sheen or petroleum odor during sediment sampling.

## Laboratory Methodologies and Determination of BaP Equivalents

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

- Metals: arsenic, barium, cadmium, chromium, copper, lead, selenium (method EPA 6010D); mercury: EPA 7471B
- Polycyclic aromatic hydrocarbons (PAHs) (method EPA 8270D by SIM)
- Diesel range organics (DRO) (method WI modified DRO, with silica gel cleanup)
- Gasoline range organics (method WI modified GRO)
- Benzene, toluene, ethylbenzene, and xylene (BTEX) (method EPA 8260D)

The PAHs that were analyzed can be grouped into two categories: carcinogenic (i.e. cancer causing) and general. To assess the contamination level of the carcinogenic PAHs in stormwater pond sediment, the MPCA requires the calculation of a "BaP equivalents value". The BaP equivalents value is a single value representing the combined potency of 17 individual carcinogenic PAH compounds with BaP (benzo[a]pyrene) acting as the reference compound. The list of compounds and their respective potency equivalents factors used to calculate the BaP equivalents value can be found in the MPCA guidance document, along with methods for addressing constituents at concentrations below the detection limit (MPCA 2017).

Laboratory analytical results for the sediment samples are summarized in Table 1. Field logs of the sediment cores are included in Attachment A, and photographs of the sediment cores are included in Attachment B. The detailed laboratory reports are included in Attachment C.

## Bathymetric Survey and Sediment Core Logs

Barr conducted a bathymetric survey of Medley Pond on September 16, 2020. Pond bottom elevations were collected using Real Time Kinematic (RTK) GPS and robotic total station survey equipment, with a horizontal accuracy of 0.03 feet and vertical accuracy of 0.1 feet. The current bathymetry of Medley Pond

is shown on Figure 1 attached to this memo. Current bottom elevations generally range from 897 feet (NAVD88) in the center of Medley Pond to 898 feet at the northeastern channel inlet.

In addition to surveying the pond bottom, the survey crew recorded the depth of "soft sediment" by measuring the depth they could push a pole by hand into the sediment. The measured soft sediment depth may represent the survey rod hitting a firm substrate like sand or clay, or may represent increasingly dense or cohesive sediments that resists further push of the survey rod by hand. The soft sediment depths are shown on Figure 2. The corresponding elevations of the bottom of soft sediment are shown on Figure 3. The soft sediment depths recorded by the survey crew ranged from approximately 0.5 - 1.5 feet in the northeast area of the pond to as much as 5 feet in the southern and northwestern areas of the pond (push depth elevation of 893.0 feet, NAVD88). The average soft sediment push depth was approximately 3.0 feet. It is hypothesized that smaller soft sediment depths were recorded in the northeast portion of the pond because larger diameter sediment, such as gravel and sand, settles more readily at the channel outlet to the pond and would restrict the depth that the rod could be pushed down by hand.

Sediment cores were collected at two locations as shown on Figure 1. The sediment cores were visually logged in the field, and sediment core logs are included in Attachment A. At location SED-01, the water depth was 0.6 feet at the time of sampling and the approximate sediment elevation was 897.7 feet, NAVD88; the sediment coring tube was pushed 4.0 feet into sediment, and 2.7 feet of sediment was recovered. Core SED-01 consisted of soft organic silt with plant matter and sand lenses over interval 0-2.6 feet, and peat 2.6-2.7 feet. At location SED-02, the water depth was 1.0 foot at the time of sampling and the approximate sediment elevation was 897.3 feet, NAVD88; the sediment core tube was pushed 5.6 feet into sediment, and 4.0 feet of sediment was recovered. Core SED-02 consisted of soft organic silt with trace sand over interval 0-2.5 feet, and peat 2.5-4.0 feet. Based on sediment coring logs at the two locations, there is a transition from soft organic silt to peat at a depth of approximately 4.5-5.0 feet below the pond water surface (assuming that the difference between sediment core push length and recovered core length is due to displacement of soft sediment and not the displacement or loss of underlying peat). Thus, the soil transition elevation is approximately 893.5 feet, NAVD88.

Unfortunately, there is no available as-built drawing for Medley Pond that would show a constructed pond bottom. However, there is a construction plan set from September 2005 that shows a proposed bottom excavation elevation of 895.0 feet (NAVD88) at the northeast inlet channel. If the northeastern portion of Medley Pond was dredged to elevation 895.0 feet as shown in the plan set, then based on the bathymetric survey, over the past 15 years approximately 3.0 feet of sediment has accumulated at the channel inlet to Medley Pond.

Since no as-built survey of Medley Pond is available, it is difficult to approximate the original, native bottom elevation before the watershed was urbanized. However, based on the soft sediment push methodology conducted during bathymetric survey and analysis of the sediment cores, we can approximate that a sediment layer transition occurs at approximately elevation 893.5 feet.

For the purpose of estimating a sediment excavation volume for this memo, excavation to elevation 894.0 feet was selected. Excavation to this elevation would correspond to a maximum water depth of 4.6 feet post-excavation, and remove the organic silt while generally avoiding the underlying peat. Avoiding the underlying peat layer is recommended as disturbance and exposure of the underlying peat could result in the release of dissolved organic carbon (DOC), which could result in the water turning brown. Peat also has a lower density, which can correlate to enhanced wind driven sediment resuspension. The estimated sediment removal required to restore the pond bottom to an elevation of 894.0 ft is 1.0 ac-ft (~1,640 cubic yards). The dredge depth and proposed pond bottom elevation will be investigated in further detail during the Medley Park Stormwater Retrofit Feasibility Study.

## Results of Sediment Characterization - BaP Equivalents

Table 1 compares the results of the laboratory analytical testing on the sediment samples to the MPCA's current SRVs and Screening SLVs. Results of DRO and GRO testing were compared to the MPCA's Unregulated Fill guidance for gross contamination of total petroleum hydrocarbons (TPH). **The BaP equivalents values in Medley Pond sediment samples ranged from 4.6 mg/kg to 6.5 mg/kg, which are greater than the Residential SRV (2mg/kg) but lower than the Industrial SRV (23 mg/kg)**. DRO results ranged from 79 mg/kg to 129 mg/kg, while GRO results were non-detect; therefore, TPH results for Medley Pond sediment samples range from 79 mg/kg to 129 mg/kg – the MPCA's total petroleum hydrocarbons threshold for Unregulated Fill is 100 mg/kg. The Medley Pond sediment could not be reused as Unregulated Fill due to BaP equivalents results exceeding the MN Residential SRV. Potential management options for Medley Pond sediment include reuse as Regulated Fill on property with a commercial or industrial land use designation, or disposal at a municipal solid waste landfill. If the sediment were reused as Regulated Fill, the costs associated with finding a suitable property to receive the sediment, conducting additional environmental investigations, and obtaining approval from the MPCA for reuse as Regulated Fill may negate any cost savings when compared to landfill disposal. Therefore, it is Barr's recommendation that the Medley Pond sediment, if excavated, be disposed in a landfill. The MPCA's current soil criteria, as well as current guidance documents and regulations, should be reviewed at the time of sediment excavation.

## References

Minnesota Pollution Control Agency (MPCA), 2012. Best Management Practices for the Off-Site Reuse of Unregulated Fill. February 2012.

MPCA, 2017. Managing Stormwater Sediment, Best Management Practice Guidance, document wq-strm4-16, May 2017.

## Tables

Table 1 – Medley Park Pond Sediment Characterization Analytical Summary

## Figures

Figure 1 – Medley Park Bathymetry Survey & Sediment Core Locations

Figure 2 – Medley Park Pond Sediment Push Depths

Figure 3 – Medley Park Pond Soft Sediment Bottom Elevations

## Attachments

Attachment A – Sediment Core Field Logs

Attachment B – Photographs

Attachment C – Laboratory Analytical Data Report

# Tables

# Table 1
## Medley Park Pond Sediment Characterization Analytical Summary

| | | | | | Location | SED-01 | | SED-02 |
|---|---|---|---|---|---|---|---|---|
| | | | | | Date | 10/13/2020 | | 10/13/2020 |
| | | | | | Depth | 0 - 2.7 ft | | 0 - 4 ft |
| | | | | | Sample Type | N | FD | N |
| Parameter | Units | MPCA Screening Soil Leaching Values | MPCA Residential Soil Reference Values | MPCA Industrial Soil Reference Values | MPCA Criteria for Unregulated Fill | | | |
| **Effective Date** | | 06/01/2013 | 12/30/2019 | 12/30/2019 | 06/22/2009 | | | |
| **Exceedance Key** | | **Bold** | Underline | No Exceed | *Italic* | | | |
| General Parameters | | | | | | | | |
| Moisture | % | | | | | 42.0 | 45.7 | 58.9 |
| Metals | | | | | | | | |
| Arsenic | mg/kg | **5.8** | 9 | 20 | *5.8* | 3.6 | 3.9 | ***6.1*** |
| Barium | mg/kg | 1700 | 1100 | 18000 | 1100 | 94.2 | 97.8 | 131 |
| Cadmium | mg/kg | 8.8 | 25 | 200 | 8.8 | 0.48 | 0.54 | 0.62 |
| Chromium | mg/kg | 36 CR6 | 87 CR6 | 650 CR6 | 36 | 20.8 | 20.3 | 23.9 |
| Copper | mg/kg | 700 | 100 | 9000 | 100 | 29.6 | 28.2 | 42.3 |
| Lead | mg/kg | 2700 | 300 | 700 | 300 | 54.8 | 48.7 | 59.0 |
| Mercury | mg/kg | 3.3 MC | 0.5 | 1.5 | 0.5 | 0.050 | 0.053 | 0.080 |
| Selenium | mg/kg | 2.6 | 160 | 1300 | 2.6 | < 0.54 U | < 0.56 U | < 0.75 U |
| Silver | mg/kg | 7.9 | 160 | 1300 | 7.9 | < 0.060 U | < 0.063 U | < 0.083 U |
| PAHs (carcinogenic) | | | | | | | | |
| 3-Methylcholanthrene | mg/kg | T | T | T | | 0.0380 J | 0.0365 J | 0.0608 J |
| 5-Methylchrysene | mg/kg | T | T | T | | 0.206 | 0.204 | 0.209 J |
| 7,12-Dimethylbenz(a)anthracene | mg/kg | T | T | T | | < 0.0629 U | < 0.0673 U | < 0.0890 U |
| 7h-Dibenzo(c,g)carbazole | mg/kg | T | T | T | | < 0.0225 U | < 0.0241 U | < 0.0319 U |
| Benz(a)anthracene | mg/kg | T | T | T | | 1.27 | 1.24 | 1.98 |
| Benzo(a)pyrene | mg/kg | T | T | T | | 1.41 | 1.38 | 1.98 |
| Benzofluoranthenes | mg/kg | T | T | T | | 3.38 | 3.43 | 4.78 |
| Chrysene | mg/kg | T | T | T | | 1.91 | 1.88 | 2.84 |
| Dibenz(a,h)acridine | mg/kg | T | T | T | | < 0.0106 U | < 0.0114 U | 0.0848 J |
| Dibenz(a,h)anthracene | mg/kg | T | T | T | | 0.263 | 0.234 | 0.338 |
| Dibenzo(a,e)pyrene | mg/kg | T | T | T | | 0.346 | 0.281 | 0.383 |
| Dibenzo(a,h)pyrene | mg/kg | T | T | T | | 0.142 J | 0.123 J | 0.17 J |
| Dibenzo(a,i)pyrene | mg/kg | T | T | T | | 0.0366 J | 0.0278 J | 0.0361 J |
| Dibenzo(a,l)pyrene | mg/kg | T | T | T | | < 0.0395 U | < 0.0423 U | < 0.0559 U |
| Indeno(1,2,3-cd)pyrene | mg/kg | T | T | T | | 0.806 | 0.686 | 0.972 |
| BaP Equivalent, Kaplan-Meier | mg/kg | **1.4 T** | 2 T(BTV) | 23 T | *1.4* | ***5.1 a*** | ***4.6 a*** | ***6.5 a*** |
| % Non-detects | % | | | | | 26.7 a | 26.7 a | 20.0 a |
| PAHs (general) | | | | | | | | |
| 2-Methylnaphthalene | mg/kg | | 100 | 369 | | 0.0220 J | 0.0215 J | 0.0904 J |
| Acenaphthene | mg/kg | 81 | 1200 | 5260 | | 0.13 J | 0.122 J | 0.431 |
| Acenaphthylene | mg/kg | NA | | | | 0.0691 J | 0.0815 J | 0.0732 J |
| Anthracene | mg/kg | 1300 | 7880 | 45400 | | 0.37 | 0.373 | 0.796 |
| Benzo(g,h,i)perylene | mg/kg | NA | | | | 0.139 J | 0.118 J | 0.165 J |
| Fluoranthene | mg/kg | 670 | 1080 | 6800 | | 4.06 | 4.11 | 6.65 |
| Fluorene | mg/kg | 110 | 850 | 4120 | | 0.195 | 0.185 | 0.49 |
| Naphthalene | mg/kg | 4.5 | 10 | 28 | | < 0.0509 U | < 0.0545 U | 0.292 |
| Phenanthrene | mg/kg | NA | | | | 2.28 | 2.21 | 4.92 |
| Pyrene | mg/kg | 440 | 890 | 5800 | | 2.92 | 2.86 | 4.64 |
| Volatile Organic Compounds | | | | | | | | |
| Benzene | mg/kg | 0.017 | 6 | 10 | | < 0.0388 U | < 0.0436 U | < 0.0556 U |
| Ethyl benzene | mg/kg | 1.0 | 200 | 200 | | < 0.0388 U | < 0.0436 U | < 0.0556 U |
| Toluene | mg/kg | 2.5 | 107 | 305 | | < 0.0388 U | < 0.0436 U | < 0.0556 U |
| Xylene, total | mg/kg | 5.4 M | 45 M | 130 M | | < 0.116 U | < 0.131 U | < 0.167 U |
| Total Petroleum Hydrocarbons | | | | | | | | |
| Diesel Range Organics, silica gel cleanup | mg/kg | | | | *100* | *129 J* | 79.4 J | 89.6 |
| Gasoline Range Organics, C6-C10 | mg/kg | | | | | < 5.0 U | < 5.3 U | < 6.9 U |

## Data Footnotes and Qualifiers

### Barr Standard Footnotes and Qualifiers

| | |
|---|---|
| N | Sample Type: Normal |
| FD | Sample Type: Field Duplicate |
| a | Estimated value, calculated using some or all values that are estimates. |
| J | Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits. |
| U | The analyte was analyzed for, but was not detected. |

### MPCA Screening Soil Leaching Values

| | |
|---|---|
| CR6 | Value represents the criteria for Chromium, hexavalent. |
| M | Value represents the criteria for mixed Xylenes. |
| MC | Mercury as Mercuric Chloride. |
| NA | Criterion value is not available for this analyte. |
| T | Value represents a criteria for the total carcinogenic PAHs as B(a)P. |

### MPCA Soil Reference Values

| | |
|---|---|
| CR6 | Value represents the criteria for Chromium, hexavalent. |
| M | Value represents the criteria for mixed Xylenes. |
| T | Value represents a criteria for the total carcinogenic PAHs as B(a)P. |
| T(BTV) | Value represents a criteria for the total carcinogenic PAHs as B(a)P; SRV set to the Background Threshold Value for BaP equivalent. |

# Figures

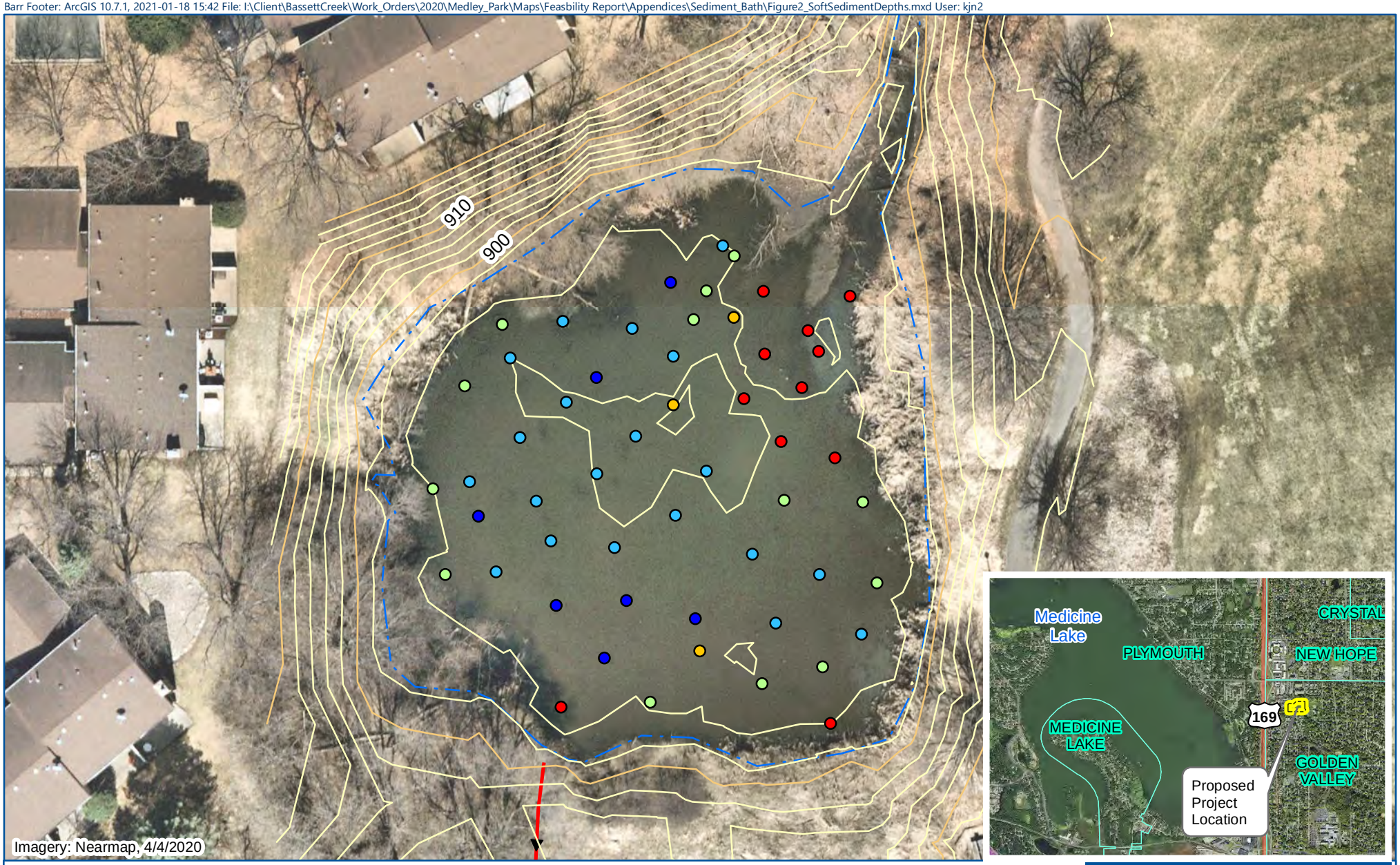
Barr Footer: ArcGIS 10.7.1, 2021-01-25 14:55 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Feasbility Report\Appendices\Sediment_Bath\Figure1_Contours_SedCoreLocations.mxd User: kjn2


BARR

# MEDLEY PARK
## Bathmetric Survey & Sediment Core Locations

FIGURE 1

Barr Footer: ArcGIS 10.7.1, 2021-01-18 15:42 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Feasbility Report\Appendices\Sediment_Bath\Figure2_SoftSedimentDepths.mxd User: kjn2




**Soft Sediment Push Depth (ft)**

- 0.5 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- 3.5 - 4.0
- 4.0 - 5.0

- Major Contour 5ft
- Minor Contour 1ft
- Water Line
- Storm Pipe

*Soft sediment push depth estimated by pressing survey rod through soft sediment to stable, subsurface sediment.

N

40 0 40

Feet

# MEDLEY PARK
## Soft Sediment Push Depths

FIGURE 2

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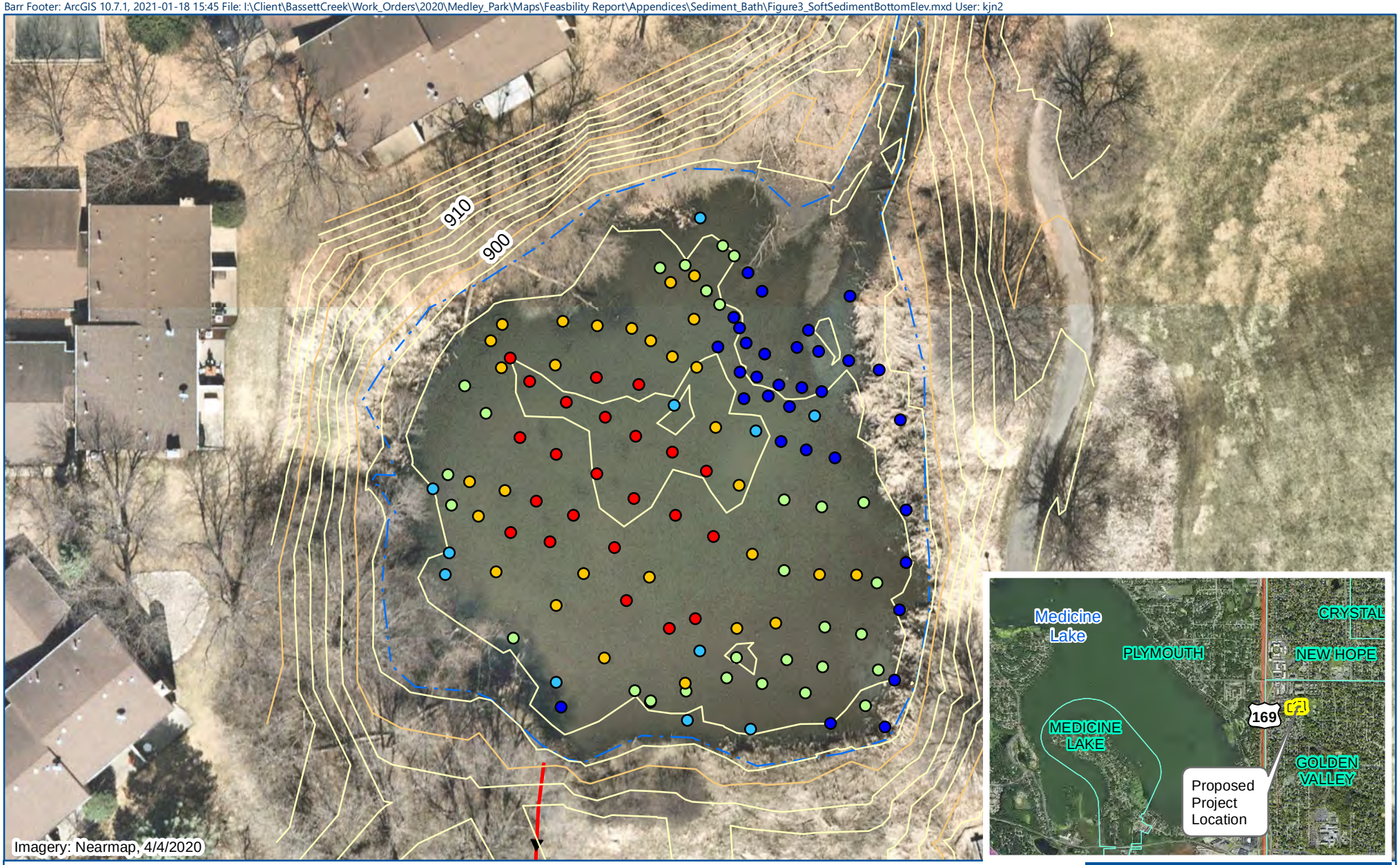


**Soft Sediment Bottom Elev (NAVD88, ft)**

- 892.8 - 893.5
- 893.5 - 894.0
- 894.0 - 895.0
- 895.0 - 896.0
- 896.0- 898.0

- Major Contour 5ft
- Minor Contour 1ft
- Water Line
- Storm Pipe

*Soft sediment bottom elevation estimated by pressing survey rod through soft sediment to stable, subsurface sediment.

N

40 0 40

Feet

# MEDLEY PARK
## Soft Sediment Bottom Elevations (NAVD88, feet)

FIGURE 3

# Attachment A

## Sediment Core Field Logs

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

# LOG OF BORING DUP-01



Project: Medly Park
Project No.: 23270051.51
Location: Golden Valley, MN
Coordinates:
Datum: NAD83

Surface Elevation:
Drilling Method: Vibracore
Sampling Method: Vibracore
Completion Depth: 4.2 ft

| Depth, feet | Sample Type & Recovery | Sample No. | ENVIRONMENTAL DATA | USCS | Graphic Log | LITHOLOGIC DESCRIPTION | Elevation, feet |
|---|---|---|---|---|---|---|---|
| 0.0 | | 1 | **D/O/S:**None/ None/ None | OL-OH | | ORGANIC SOIL (OL-OH): black and dark gray; moist; soft; organic silts with leaves and small roots, cohesive; non-plastic; no odor; no sheen; no discoloration. | |
| | | | | | | Very fine grained sand leses at 1'-1.5'. | |
| 2.5 | | | | PT | | PEAT (PT): dark brown; moist; soft; organic peat, cohesive; non-plastic; no odor; no sheen; no discoloration; non-plastic plasticity. | |
| | | | | | | End of boring 4.2 feet | |
| 5.0 | | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |

Date Boring Started: 10/13/20
Date Boring Completed: 10/13/20
Logged By: JWJ
Drilling Contractor: Barr
Drill Rig: John Boat Vibracore

Remarks: Duplicate core of SED-01. Pond water depth at sediment coring location was 0.6 feet.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

# LOG OF BORING SED-01



Project: Medly Park
Project No.: 23270051.51
Location: Golden Valley, MN
Coordinates:
Datum: NAD83

Surface Elevation:
Drilling Method: Vibracore
Sampling Method: Vibracore
Completion Depth: 4.0 ft

| Depth, feet | Sample Type & Recovery | Sample No. | ENVIRONMENTAL DATA | USCS | Graphic Log | LITHOLOGIC DESCRIPTION | Elevation, feet |
|---|---|---|---|---|---|---|---|
| 0.0 | | 1 | **D/O/S:**None/ None/ None | OL-OH | | ORGANIC SOIL (OL-OH): black and dark grey; wet; soft; organic silts with leaves and small roots, cohesive; non-plastic; no odor; no sheen; no discoloration. | |
| | | | | | | Fine grained sand lenses. | |
| | | | | | | Fine grained sand lenses. | |
| 2.5 | | | | PT | | PEAT (PT): dark brown; wet; soft; organic peat, soft, decayed, cohesive; non-plastic; no odor; no sheen; no discoloration. | |
| | | | | | | End of boring 4.0 feet | |
| 5.0 | | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |

Date Boring Started: 10/13/20
Date Boring Completed: 10/13/20
Logged By: JWJ
Drilling Contractor: Barr
Drill Rig: John Boat Vibracore

Remarks: Pond water depth at sediment coring location was 0.6 feet.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

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Minneapolis, MN 55435
Telephone: 952-832-2600

# LOG OF BORING SED-02



Project: Medly Park
Project No.: 23270051.51
Location: Golden Valley, MN
Coordinates:
Datum: NAD83

Surface Elevation:
Drilling Method: Vibracore
Sampling Method: Vibracore
Completion Depth: 5.6 ft

| Depth, feet | Sample Type & Recovery | Sample No. | ENVIRONMENTAL DATA | USCS | Graphic Log | LITHOLOGIC DESCRIPTION | Elevation, feet |
|---|---|---|---|---|---|---|---|
| 0.0 | | | | OL-OH | | ORGANIC SOIL (OL-OH): Black and dark grey; wet; soft; organic silts with leaves and trace roots, trace very fine grained sand, cohesive; non-plastic; no odor; no sheen; no discoloration. | |
| 2.5 | | 1 | **D/O/S:**None/ None/ None | PT | | PEAT (PT): Dark brown; moist; soft; organic peats with tiny roots, trace black organic silts, cohesive; non-plastic; no odor; no sheen; no discoloration. | |
| 5.0 | | | | | | End of boring 5.6 feet | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |

Date Boring Started: 10/13/20
Date Boring Completed: 10/13/20
Logged By: JWJ
Drilling Contractor: Barr
Drill Rig: John Boat Vibracore

Remarks: Pond water depth at sediment coring location was 1.0 feet.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

6.0 - 2.0

page 1 of 1

# Sediment Core/Boring Log

BARR

CS: Cyre sampler
VC: vibracore
PC: push core

Proj#: _____ Project: _____ Core/Boring#: SED-01

Collection Date(s): 10-13-2020 GPS X: _____ Length of Push (feet): 4.0 Driller: _____ Drilling Method: VC

Ice Thickness (feet): — GPS Y: _____ Recovery (feet): 2.7 Crew: _____ Logged by: JWS

Water Depth (feet): 0.6 GPS Z: _____ % Recovery: _____ Observer: _____ Checked by: KDM

| Depth (ft.) | | Sample Interval and number | Properties: Moisture | Density or Consistency | Plasticity | Cohesiveness | Particles | Odor | Staining | Sheen | USCS Classification | Graphic Log | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0-2.7 | W | Soft | No | Yes | Organic leafs & roots | | | | OL/OH | | 0-2.6' = Black and dark gray organic silts w/ leafs and small roots. Vfg sand lenses @ 0.8, 1.7' |
| 1 | 2 | | | | | | | | | | | | |
| 2 | 2.7 | | | | | | | | | | | | 2.6'-2.7' = Dark brown organic peat, soft decayed |

Sampled 0'-2.7' @ 10:30

6.0 - 1.8 = 4.2



# Sediment Core/Boring Log

CS: Cyre sampler
VC: vibracore
PC: push core

(@SED-01)

Proj#: 23270051.57 Project: Medley Park Pond
Collection Date(s): 10-13-2020 GPS X:
Ice Thickness (feet): — GPS Y:
Water Depth (feet): 0.6 GPS Z:
Length of Push (feet): 4.2 Driller: Barr
Recovery (feet): 2.9 Crew:
% Recovery: Observer:
Core/Boring#: DUP-01
Drilling Method: VC
Logged by: JWS
Checked by: KDM

| Depth (ft.) | | Sample Interval and number | Properties: Moisture | Density or Consistency | Plasticity | Cohesiveness | Particles | Odor | Staining | Sheen | USCS Classification | Graphic Log | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | M | soft | N | Yes | leaves + roots | N | N | N | OL/OH | | 0-2.5 = Black and dark gray organic silts w/ leafs + roots (small) Sand vfg lenses @ 1'-1.5' |
| 1 | 1 | 0'-2.9' | ↓ | ↓ | ↓ | ↓ | | ↓ | ↓ | ↓ | ↓ | | |
| 2 | 2 | | | | | | | | | | | | 2.5-2.9 = Dark brown organic Peat, soft |
| | 2.9 | | | | | | No | | | | | | |
| | | | | | | | | | | | | | Sampled 0'-2.9' No sample time for dup |

8.0-2.4



BARR

# Sediment Core/Boring Log

CS: Cyre sampler
VC: vibracore
PC: push core

Proj#: 23270051.51 Project: Medley Park Pond Core/Boring#: SED-02

Collection Date(s): 10-13-2020 GPS X: Length of Push (feet): 5.6 Driller: Barr Drilling Method: VC

Ice Thickness (feet): — GPS Y: Recovery (feet): 4.0 Crew: JWS/KDM Logged by: JWS

Water Depth (feet): 1.0 GPS Z: % Recovery: Observer: Checked by: KDM

| Depth (ft.) | | Sample Interval and number | Properties: Moisture | Density or Consistency | Plasticity | Cohesiveness | Particles | Odor | Staining | Sheen | USCS Classification | Graphic Log | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | W | Soft | N | Yes | leafs | N | N | N | OL/OH | | 0'-2.5' = Black and Dark gray organic silts w/ leafs and fine roots trace vfg sand |
| 1 | 1 | 0'-4' | M | | | | | | | | | | |
| | 2 | | | | | | | | | | | | 2.5'-4.0' = Dark Brown organic fibrous peats w/ fine roots trace Black organic silts |
| 2 | | | | | | | No | | | | | | |
| | 3 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | |

Sampled 0'-4' @ 11:30

# Attachment B

## Photographs

Photograph #1: Medley Pond, northeast shoreline facing southwest.


Photograph #2: Medley Pond, sediment core SED-01.

Photograph #3: Medley Pond, sediment core SED-02.

# Attachment C

## Laboratory Analytical Data Report

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

October 23, 2020

Kevin Menken
Barr Engineering
4300 MarketPointe Drive
Suite 200
Minneapolis, MN 55435

RE: Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

Dear Kevin Menken:

Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis
- Pace Analytical Services - Montana

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

Sincerely,

Amanda J Albrecht

Amanda Albrecht
amanda.albrecht@pacelabs.com
(612)607-6382
Project Manager

Enclosures

cc: BarrDM, Barr Engineering Company
Data Management, Barr Engineering
Terri Olson, Barr Engineering Company
Accounts Payable, Barr Engineering

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

# CERTIFICATIONS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Pace Analytical Services - Minneapolis MN**

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

**Pace Analytical Services Montana**

150 N. 9th Street, Billings, MT 59101
A2LA Certification: # 3590.01
EPA Region 8 Certification #: 8TMS-L
Idaho Certification #: MT00012
Minnesota Dept of Health Certification #: 030-999-442
Montana Certification #: MT CERT0040
North Dakota Dept. Of Health #: R-209
Washington Department of Ecology #: C993
Nevada Certificate # : MT00012

## REPORT OF LABORATORY ANALYSIS

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

## SAMPLE SUMMARY

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **10535359001** | **SED-01** | Solid | 10/13/20 10:30 | 10/13/20 16:00 |
| **10535359002** | **SED-02** | Solid | 10/13/20 11:30 | 10/13/20 16:00 |
| **10535359003** | **DUP-01** | Solid | 10/13/20 00:00 | 10/13/20 16:00 |
| **10535359004** | **Tip Blank** | Solid | 10/13/20 00:00 | 10/13/20 16:00 |

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

## SAMPLE ANALYTE COUNT

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **10535359001** | **SED-01** | WI MOD DRO | JVM | 2 | PASI-M |
| | | WI MOD GRO | NS1 | 2 | PASI-M |
| | | EPA 6010D | DCF | 8 | PASI-M |
| | | EPA 7471B | LMW | 1 | PASI-M |
| | | ASTM D2974 | JDL | 1 | PASI-M |
| | | EPA 8270E by SIM | CH3 | 27 | PASI-M |
| | | EPA 8260D | MAM | 8 | PASI-MT |
| **10535359002** | **SED-02** | WI MOD DRO | JVM | 2 | PASI-M |
| | | WI MOD GRO | NS1 | 2 | PASI-M |
| | | EPA 6010D | DCF | 8 | PASI-M |
| | | EPA 7471B | LMW | 1 | PASI-M |
| | | ASTM D2974 | JDL | 1 | PASI-M |
| | | EPA 8270E by SIM | CH3 | 27 | PASI-M |
| | | EPA 8260D | MAM | 8 | PASI-MT |
| **10535359003** | **DUP-01** | WI MOD DRO | JVM | 2 | PASI-M |
| | | WI MOD GRO | NS1 | 2 | PASI-M |
| | | EPA 6010D | DCF | 8 | PASI-M |
| | | EPA 7471B | LMW | 1 | PASI-M |
| | | ASTM D2974 | JDL | 1 | PASI-M |
| | | EPA 8270E by SIM | CH3 | 27 | PASI-M |
| | | EPA 8260D | MAM | 8 | PASI-MT |
| **10535359004** | **Tip Blank** | WI MOD GRO | NS1 | 2 | PASI-M |
| | | EPA 8260D | MAM | 8 | PASI-MT |

PASI-M = Pace Analytical Services - Minneapolis
PASI-MT = Pace Analytical Services - Montana

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: SED-01** **Lab ID: 10535359001** Collected: 10/13/20 10:30 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **WIDRO GCS Silica Gel** | Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| WDRO C10-C28 | **129** | mg/kg | 11.3 | 3.0 | 1 | 10/15/20 14:48 | 10/17/20 20:49 | | T6 |
| ***Surrogates*** | | | | | | | | | |
| n-Triacontane (S) | 56 | %. | 30-150 | | 1 | 10/15/20 14:48 | 10/17/20 20:49 | 638-68-6 | |
| **WIGRO GCV** | Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Gasoline Range Organics | **<5.0** | mg/kg | 17.5 | 5.0 | 1 | 10/14/20 11:00 | 10/15/20 00:59 | | |
| ***Surrogates*** | | | | | | | | | |
| a,a,a-Trifluorotoluene (S) | 98 | %. | 80-150 | | 1 | 10/14/20 11:00 | 10/15/20 00:59 | 98-08-8 | |
| **6010D MET ICP** | Analytical Method: EPA 6010D Preparation Method: EPA 3050B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Arsenic | **3.6** | mg/kg | 1.7 | 0.34 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-38-2 | |
| Barium | **94.2** | mg/kg | 0.83 | 0.13 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-39-3 | |
| Cadmium | **0.48** | mg/kg | 0.25 | 0.050 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-43-9 | |
| Chromium | **20.8** | mg/kg | 0.83 | 0.17 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-47-3 | |
| Copper | **29.6** | mg/kg | 0.83 | 0.23 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-50-8 | |
| Lead | **54.8** | mg/kg | 0.83 | 0.19 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7439-92-1 | |
| Selenium | **<0.54** | mg/kg | 1.7 | 0.54 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7782-49-2 | |
| Silver | **<0.060** | mg/kg | 0.83 | 0.060 | 1 | 10/15/20 16:13 | 10/16/20 12:21 | 7440-22-4 | |
| **7471B Mercury** | Analytical Method: EPA 7471B Preparation Method: EPA 7471B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Mercury | **0.050** | mg/kg | 0.031 | 0.013 | 1 | 10/15/20 16:31 | 10/15/20 18:16 | 7439-97-6 | |
| **Dry Weight / %M by ASTM D2974** | Analytical Method: ASTM D2974<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Percent Moisture | **42.0** | % | 0.10 | 0.10 | 1 | | 10/21/20 11:19 | | N2 |
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| 2-Methylnaphthalene | **22.0J** | ug/kg | 172 | 15.7 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 91-57-6 | |
| 3-Methylcholanthrene | **38.0J** | ug/kg | 172 | 19.2 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 56-49-5 | |
| 5-Methylchrysene | **206** | ug/kg | 172 | 11.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 3697-24-3 | M6 |
| 7,12-Dimethylbenz(a)anthracene | **<62.9** | ug/kg | 172 | 62.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 57-97-6 | M6 |
| 7H-Dibenzo(c,g)carbazole | **<22.5** | ug/kg | 172 | 22.5 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 194-59-2 | |
| Acenaphthene | **130J** | ug/kg | 172 | 54.0 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 83-32-9 | |
| Acenaphthylene | **69.1J** | ug/kg | 172 | 44.5 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 208-96-8 | |
| Anthracene | **370** | ug/kg | 172 | 27.7 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 120-12-7 | |
| Benzo(a)anthracene | **1270** | ug/kg | 172 | 19.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 56-55-3 | |
| Benzo(a)pyrene | **1410** | ug/kg | 172 | 15.5 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 50-32-8 | M6 |
| Benzo(g,h,i)perylene | **139J** | ug/kg | 172 | 22.3 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 191-24-2 | M6 |
| Benzofluoranthenes (Total) | **3380** | ug/kg | 515 | 41.8 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | | N2 |
| Chrysene | **1910** | ug/kg | 172 | 24.4 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 218-01-9 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: SED-01** **Lab ID: 10535359001** Collected: 10/13/20 10:30 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Dibenz(a,h)acridine | **<10.6** | ug/kg | 172 | 10.6 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 226-36-8 | |
| Dibenz(a,h)anthracene | **263** | ug/kg | 172 | 20.6 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 53-70-3 | |
| Dibenzo(a,e)pyrene | **346** | ug/kg | 172 | 22.0 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 192-65-4 | M6 |
| Dibenzo(a,h)pyrene | **142J** | ug/kg | 172 | 12.4 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 189-64-0 | M6 |
| Dibenzo(a,i)pyrene | **36.6J** | ug/kg | 172 | 17.5 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 189-55-9 | M6 |
| Dibenzo(a,l)pyrene | **<39.5** | ug/kg | 172 | 39.5 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 191-30-0 | M6 |
| Fluoranthene | **4060** | ug/kg | 172 | 34.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 206-44-0 | |
| Fluorene | **195** | ug/kg | 172 | 36.1 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | **806** | ug/kg | 172 | 18.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 193-39-5 | M6 |
| Naphthalene | **<50.9** | ug/kg | 172 | 50.9 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 91-20-3 | |
| Phenanthrene | **2280** | ug/kg | 172 | 29.0 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 85-01-8 | M6 |
| Pyrene | **2920** | ug/kg | 172 | 20.4 | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 67 | %. | 42-125 | | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 321-60-8 | D3 |
| p-Terphenyl-d14 (S) | 64 | %. | 46-125 | | 10 | 10/14/20 13:07 | 10/15/20 22:07 | 1718-51-0 | |
| **8260D MSV UST** | Analytical Method: EPA 8260D Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Montana | | | | | | | | |
| Benzene | **<38.8** | ug/kg | 77.6 | 38.8 | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 71-43-2 | |
| Ethylbenzene | **<38.8** | ug/kg | 77.6 | 38.8 | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 100-41-4 | |
| Toluene | **<38.8** | ug/kg | 77.6 | 38.8 | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 108-88-3 | |
| Xylene (Total) | **<116** | ug/kg | 233 | 116 | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Dibromofluoromethane (S) | 93 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 1868-53-7 | |
| 1,2-Dichloroethane-d4 (S) | 94 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 17060-07-0 | |
| Toluene-d8 (S) | 101 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 103 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:24 | 460-00-4 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: SED-02** **Lab ID: 10535359002** Collected: 10/13/20 11:30 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **WIDRO GCS Silica Gel** | Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| WDRO C10-C28 | **89.6** | mg/kg | 13.6 | 3.6 | 1 | 10/15/20 14:48 | 10/17/20 20:42 | | T6 |
| ***Surrogates*** | | | | | | | | | |
| n-Triacontane (S) | 80 | %. | 30-150 | | 1 | 10/15/20 14:48 | 10/17/20 20:42 | 638-68-6 | |
| **WIGRO GCV** | Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Gasoline Range Organics | **<6.9** | mg/kg | 24.2 | 6.9 | 1 | 10/14/20 11:00 | 10/15/20 01:27 | | |
| ***Surrogates*** | | | | | | | | | |
| a,a,a-Trifluorotoluene (S) | 102 | %. | 80-150 | | 1 | 10/14/20 11:00 | 10/15/20 01:27 | 98-08-8 | |
| **6010D MET ICP** | Analytical Method: EPA 6010D Preparation Method: EPA 3050B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Arsenic | **6.1** | mg/kg | 2.3 | 0.47 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-38-2 | |
| Barium | **131** | mg/kg | 1.1 | 0.18 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-39-3 | |
| Cadmium | **0.62** | mg/kg | 0.34 | 0.068 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-43-9 | |
| Chromium | **23.9** | mg/kg | 1.1 | 0.23 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-47-3 | |
| Copper | **42.3** | mg/kg | 1.1 | 0.32 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-50-8 | |
| Lead | **59.0** | mg/kg | 1.1 | 0.26 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7439-92-1 | |
| Selenium | **<0.75** | mg/kg | 2.3 | 0.75 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7782-49-2 | |
| Silver | **<0.083** | mg/kg | 1.1 | 0.083 | 1 | 10/15/20 16:13 | 10/16/20 12:26 | 7440-22-4 | |
| **7471B Mercury** | Analytical Method: EPA 7471B Preparation Method: EPA 7471B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Mercury | **0.080** | mg/kg | 0.043 | 0.018 | 1 | 10/15/20 16:31 | 10/15/20 18:18 | 7439-97-6 | |
| **Dry Weight / %M by ASTM D2974** | Analytical Method: ASTM D2974<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Percent Moisture | **58.9** | % | 0.10 | 0.10 | 1 | | 10/21/20 11:20 | | N2 |
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| 2-Methylnaphthalene | **90.4J** | ug/kg | 243 | 22.2 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 91-57-6 | |
| 3-Methylcholanthrene | **60.8J** | ug/kg | 243 | 27.2 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 56-49-5 | |
| 5-Methylchrysene | **209J** | ug/kg | 243 | 16.8 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 3697-24-3 | |
| 7,12-Dimethylbenz(a)anthracene | **<89.0** | ug/kg | 243 | 89.0 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 57-97-6 | |
| 7H-Dibenzo(c,g)carbazole | **<31.9** | ug/kg | 243 | 31.9 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 194-59-2 | |
| Acenaphthene | **431** | ug/kg | 243 | 76.3 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 83-32-9 | |
| Acenaphthylene | **73.2J** | ug/kg | 243 | 63.0 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 208-96-8 | |
| Anthracene | **796** | ug/kg | 243 | 39.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 120-12-7 | |
| Benzo(a)anthracene | **1980** | ug/kg | 243 | 28.2 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 56-55-3 | |
| Benzo(a)pyrene | **1980** | ug/kg | 243 | 22.0 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 50-32-8 | |
| Benzo(g,h,i)perylene | **165J** | ug/kg | 243 | 31.6 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 191-24-2 | |
| Benzofluoranthenes (Total) | **4780** | ug/kg | 729 | 59.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | | N2 |
| Chrysene | **2840** | ug/kg | 243 | 34.5 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 218-01-9 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: SED-02** **Lab ID: 10535359002** Collected: 10/13/20 11:30 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Dibenz(a,h)acridine | **84.8J** | ug/kg | 243 | 15.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 226-36-8 | |
| Dibenz(a,h)anthracene | **338** | ug/kg | 243 | 29.2 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 53-70-3 | |
| Dibenzo(a,e)pyrene | **383** | ug/kg | 243 | 31.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 192-65-4 | |
| Dibenzo(a,h)pyrene | **170J** | ug/kg | 243 | 17.6 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 189-64-0 | |
| Dibenzo(a,i)pyrene | **36.1J** | ug/kg | 243 | 24.8 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 189-55-9 | |
| Dibenzo(a,l)pyrene | **<55.9** | ug/kg | 243 | 55.9 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 191-30-0 | |
| Fluoranthene | **6650** | ug/kg | 243 | 49.4 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 206-44-0 | |
| Fluorene | **490** | ug/kg | 243 | 51.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | **972** | ug/kg | 243 | 26.7 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 193-39-5 | |
| Naphthalene | **292** | ug/kg | 243 | 72.0 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 91-20-3 | |
| Phenanthrene | **4920** | ug/kg | 243 | 41.1 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 85-01-8 | |
| Pyrene | **4640** | ug/kg | 243 | 28.9 | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 65 | %. | 42-125 | | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 321-60-8 | D3 |
| p-Terphenyl-d14 (S) | 60 | %. | 46-125 | | 10 | 10/14/20 13:07 | 10/15/20 23:28 | 1718-51-0 | |
| **8260D MSV UST** | Analytical Method: EPA 8260D Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Montana | | | | | | | | |
| Benzene | **<55.6** | ug/kg | 111 | 55.6 | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 71-43-2 | |
| Ethylbenzene | **<55.6** | ug/kg | 111 | 55.6 | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 100-41-4 | |
| Toluene | **<55.6** | ug/kg | 111 | 55.6 | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 108-88-3 | |
| Xylene (Total) | **<167** | ug/kg | 334 | 167 | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Dibromofluoromethane (S) | 91 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 1868-53-7 | |
| 1,2-Dichloroethane-d4 (S) | 90 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 17060-07-0 | |
| Toluene-d8 (S) | 100 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 99 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 18:44 | 460-00-4 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: DUP-01** **Lab ID: 10535359003** Collected: 10/13/20 00:00 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **WIDRO GCS Silica Gel** | Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| WDRO C10-C28 | **79.4** | mg/kg | 12.3 | 3.3 | 1 | 10/15/20 14:48 | 10/17/20 20:56 | | T6 |
| ***Surrogates*** | | | | | | | | | |
| n-Triacontane (S) | 75 | %. | 30-150 | | 1 | 10/15/20 14:48 | 10/17/20 20:56 | 638-68-6 | |
| **WIGRO GCV** | Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Gasoline Range Organics | **<5.3** | mg/kg | 18.7 | 5.3 | 1 | 10/14/20 11:00 | 10/15/20 01:54 | | |
| ***Surrogates*** | | | | | | | | | |
| a,a,a-Trifluorotoluene (S) | 101 | %. | 80-150 | | 1 | 10/14/20 11:00 | 10/15/20 01:54 | 98-08-8 | |
| **6010D MET ICP** | Analytical Method: EPA 6010D Preparation Method: EPA 3050B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Arsenic | **3.9** | mg/kg | 1.7 | 0.35 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-38-2 | |
| Barium | **97.8** | mg/kg | 0.86 | 0.14 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-39-3 | |
| Cadmium | **0.54** | mg/kg | 0.26 | 0.052 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-43-9 | |
| Chromium | **20.3** | mg/kg | 0.86 | 0.17 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-47-3 | |
| Copper | **28.2** | mg/kg | 0.86 | 0.24 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-50-8 | |
| Lead | **48.7** | mg/kg | 0.86 | 0.19 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7439-92-1 | |
| Selenium | **<0.56** | mg/kg | 1.7 | 0.56 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7782-49-2 | |
| Silver | **<0.063** | mg/kg | 0.86 | 0.063 | 1 | 10/15/20 16:13 | 10/16/20 12:27 | 7440-22-4 | |
| **7471B Mercury** | Analytical Method: EPA 7471B Preparation Method: EPA 7471B<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Mercury | **0.053** | mg/kg | 0.036 | 0.015 | 1 | 10/15/20 16:31 | 10/15/20 18:23 | 7439-97-6 | |
| **Dry Weight / %M by ASTM D2974** | Analytical Method: ASTM D2974<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Percent Moisture | **45.7** | % | 0.10 | 0.10 | 1 | | 10/21/20 11:20 | | N2 |
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| 2-Methylnaphthalene | **21.5J** | ug/kg | 184 | 16.8 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 91-57-6 | |
| 3-Methylcholanthrene | **36.5J** | ug/kg | 184 | 20.6 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 56-49-5 | |
| 5-Methylchrysene | **204** | ug/kg | 184 | 12.7 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 3697-24-3 | |
| 7,12-Dimethylbenz(a)anthracene | **<67.3** | ug/kg | 184 | 67.3 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 57-97-6 | |
| 7H-Dibenzo(c,g)carbazole | **<24.1** | ug/kg | 184 | 24.1 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 194-59-2 | |
| Acenaphthene | **122J** | ug/kg | 184 | 57.8 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 83-32-9 | |
| Acenaphthylene | **81.5J** | ug/kg | 184 | 47.7 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 208-96-8 | |
| Anthracene | **373** | ug/kg | 184 | 29.6 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 120-12-7 | |
| Benzo(a)anthracene | **1240** | ug/kg | 184 | 21.3 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 56-55-3 | |
| Benzo(a)pyrene | **1380** | ug/kg | 184 | 16.6 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 50-32-8 | |
| Benzo(g,h,i)perylene | **118J** | ug/kg | 184 | 23.9 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 191-24-2 | |
| Benzofluoranthenes (Total) | **3430** | ug/kg | 552 | 44.7 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | | N2 |
| Chrysene | **1880** | ug/kg | 184 | 26.1 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 218-01-9 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street - Suite 200
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(612)607-1700

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: DUP-01** **Lab ID: 10535359003** Collected: 10/13/20 00:00 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270E MSSV CPAH by SIM** | Analytical Method: EPA 8270E by SIM Preparation Method: EPA 3550C<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Dibenz(a,h)acridine | **<11.4** | ug/kg | 184 | 11.4 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 226-36-8 | |
| Dibenz(a,h)anthracene | **234** | ug/kg | 184 | 22.1 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 53-70-3 | |
| Dibenzo(a,e)pyrene | **281** | ug/kg | 184 | 23.6 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 192-65-4 | |
| Dibenzo(a,h)pyrene | **123J** | ug/kg | 184 | 13.3 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 189-64-0 | |
| Dibenzo(a,i)pyrene | **27.8J** | ug/kg | 184 | 18.8 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 189-55-9 | |
| Dibenzo(a,l)pyrene | **<42.3** | ug/kg | 184 | 42.3 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 191-30-0 | |
| Fluoranthene | **4110** | ug/kg | 184 | 37.4 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 206-44-0 | |
| Fluorene | **185** | ug/kg | 184 | 38.6 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | **686** | ug/kg | 184 | 20.2 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 193-39-5 | |
| Naphthalene | **<54.5** | ug/kg | 184 | 54.5 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 91-20-3 | |
| Phenanthrene | **2210** | ug/kg | 184 | 31.1 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 85-01-8 | |
| Pyrene | **2860** | ug/kg | 184 | 21.9 | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 72 | %. | 42-125 | | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 321-60-8 | D3 |
| p-Terphenyl-d14 (S) | 67 | %. | 46-125 | | 10 | 10/14/20 13:07 | 10/15/20 23:55 | 1718-51-0 | |
| **8260D MSV UST** | Analytical Method: EPA 8260D Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Montana | | | | | | | | |
| Benzene | **<43.6** | ug/kg | 87.2 | 43.6 | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 71-43-2 | |
| Ethylbenzene | **<43.6** | ug/kg | 87.2 | 43.6 | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 100-41-4 | |
| Toluene | **<43.6** | ug/kg | 87.2 | 43.6 | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 108-88-3 | |
| Xylene (Total) | **<131** | ug/kg | 262 | 131 | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Dibromofluoromethane (S) | 91 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 1868-53-7 | |
| 1,2-Dichloroethane-d4 (S) | 92 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 17060-07-0 | |
| Toluene-d8 (S) | 101 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 103 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 19:05 | 460-00-4 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

**Sample: Tip Blank** **Lab ID: 10535359004** Collected: 10/13/20 00:00 Received: 10/13/20 16:00 Matrix: Solid

***Results reported on a "wet-weight" basis***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **WIGRO GCV** | Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil<br>Pace Analytical Services - Minneapolis | | | | | | | | |
| Gasoline Range Organics | **<2.8** | mg/kg | 10.0 | 2.8 | 1 | 10/19/20 10:41 | 10/20/20 02:38 | | |
| ***Surrogates*** | | | | | | | | | |
| a,a,a-Trifluorotoluene (S) | 98 | %. | 80-150 | | 1 | 10/19/20 10:41 | 10/20/20 02:38 | 98-08-8 | |
| **8260D MSV UST** | Analytical Method: EPA 8260D Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Montana | | | | | | | | |
| Benzene | **<25.0** | ug/kg | 50.0 | 25.0 | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 71-43-2 | |
| Ethylbenzene | **<25.0** | ug/kg | 50.0 | 25.0 | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 100-41-4 | |
| Toluene | **<25.0** | ug/kg | 50.0 | 25.0 | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 108-88-3 | |
| Xylene (Total) | **<75.0** | ug/kg | 150 | 75.0 | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Dibromofluoromethane (S) | 92 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 1868-53-7 | |
| 1,2-Dichloroethane-d4 (S) | 89 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 17060-07-0 | |
| Toluene-d8 (S) | 103 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 96 | %. | 75-125 | | 1 | 10/20/20 12:33 | 10/20/20 15:20 | 460-00-4 | |

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 704364
QC Batch Method: EPA 5030 Medium Soil
Analysis Method: WI MOD GRO
Analysis Description: WIGRO Solid GCV
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

METHOD BLANK: 3763027 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | <2.8 | 10.0 | 2.8 | 10/14/20 13:55 | |
| a,a,a-Trifluorotoluene (S) | %. | 91 | 80-150 | | 10/14/20 13:55 | |

LABORATORY CONTROL SAMPLE & LCSD: 3763028 3763029

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | 50 | 41.7 | 49.2 | 83 | 98 | 80-120 | 17 | 20 | |
| a,a,a-Trifluorotoluene (S) | %. | | | | 105 | 107 | 80-150 | | | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3763110 3763111

| Parameter | Units | 10535347001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | ND | 54.1 | 54.1 | 54.6 | 50.2 | 101 | 93 | 80-120 | 9 | 20 | G+ |
| a,a,a-Trifluorotoluene (S) | %. | | | | | | 100 | 92 | 80-150 | | | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 705230
QC Batch Method: EPA 5030 Medium Soil
Analysis Method: WI MOD GRO
Analysis Description: WIGRO Solid GCV
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359004

METHOD BLANK: 3768022 Matrix: Solid
Associated Lab Samples: 10535359004

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | <2.8 | 10.0 | 2.8 | 10/19/20 15:19 | |
| a,a,a-Trifluorotoluene (S) | %. | 98 | 80-150 | | 10/19/20 15:19 | |

LABORATORY CONTROL SAMPLE & LCSD: 3768023 3768024

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | 50 | 48.4 | 50.9 | 97 | 102 | 80-120 | 5 | 20 | |
| a,a,a-Trifluorotoluene (S) | %. | | | | 98 | 98 | 80-150 | | | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3768135 3768136

| Parameter | Units | 10535689002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | ND | 60.1 | 60.1 | 65.8 | 60.7 | 109 | 100 | 80-120 | 8 | 20 | |
| a,a,a-Trifluorotoluene (S) | %. | | | | | | 98 | 99 | 80-150 | | | |

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

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
1700 Elm Street - Suite 200
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(612)607-1700

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 704597
QC Batch Method: EPA 7471B
Analysis Method: EPA 7471B
Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

METHOD BLANK: 3764269 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Mercury | mg/kg | <0.0078 | 0.019 | 0.0078 | 10/15/20 17:50 | |

LABORATORY CONTROL SAMPLE: 3764270

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Mercury | mg/kg | 0.47 | 0.47 | 101 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3764271 3764272

| Parameter | Units | 10534433003 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | mg/kg | 0.87 | 0.96 | 1 | 2.0 | 2.2 | 114 | 127 | 80-120 | 10 | 20 | E,M1 |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 704596
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

METHOD BLANK: 3764265 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | <0.20 | 0.95 | 0.20 | 10/16/20 11:51 | |
| Barium | mg/kg | <0.075 | 0.48 | 0.075 | 10/16/20 11:51 | |
| Cadmium | mg/kg | <0.029 | 0.14 | 0.029 | 10/16/20 11:51 | |
| Chromium | mg/kg | <0.095 | 0.48 | 0.095 | 10/16/20 11:51 | |
| Copper | mg/kg | <0.13 | 0.48 | 0.13 | 10/16/20 11:51 | |
| Lead | mg/kg | <0.11 | 0.48 | 0.11 | 10/16/20 11:51 | |
| Selenium | mg/kg | <0.31 | 0.95 | 0.31 | 10/16/20 11:51 | |
| Silver | mg/kg | <0.035 | 0.48 | 0.035 | 10/16/20 11:51 | |

LABORATORY CONTROL SAMPLE: 3764266

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 46.7 | 45.3 | 97 | 80-120 | |
| Barium | mg/kg | 46.7 | 48.6 | 104 | 80-120 | |
| Cadmium | mg/kg | 46.7 | 49.5 | 106 | 80-120 | |
| Chromium | mg/kg | 46.7 | 49.2 | 105 | 80-120 | |
| Copper | mg/kg | 46.7 | 47.6 | 102 | 80-120 | |
| Lead | mg/kg | 46.7 | 48.8 | 104 | 80-120 | |
| Selenium | mg/kg | 46.7 | 45.2 | 97 | 80-120 | |
| Silver | mg/kg | 23.4 | 23.4 | 100 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3764267 3764268

| Parameter | Units | 10534433003 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 5.4 | 101 | 105 | 92.5 | 98.0 | 86 | 88 | 75-125 | 6 | 20 | |
| Barium | mg/kg | 146 | 101 | 105 | 241 | 255 | 94 | 104 | 75-125 | 6 | 20 | |
| Cadmium | mg/kg | 0.60 | 101 | 105 | 92.4 | 97.3 | 91 | 92 | 75-125 | 5 | 20 | |
| Chromium | mg/kg | 19.0 | 101 | 105 | 115 | 123 | 95 | 99 | 75-125 | 7 | 20 | |
| Copper | mg/kg | 25.7 | 101 | 105 | 117 | 126 | 90 | 95 | 75-125 | 7 | 20 | |
| Lead | mg/kg | 28.1 | 101 | 105 | 112 | 160 | 83 | 125 | 75-125 | 35 | 20 | R1 |
| Selenium | mg/kg | ND | 101 | 105 | 91.1 | 97.3 | 89 | 91 | 75-125 | 7 | 20 | |
| Silver | mg/kg | ND | 50.6 | 52.7 | 45.2 | 48.4 | 89 | 92 | 75-125 | 7 | 20 | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 705751
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

SAMPLE DUPLICATE: 3770546

| Parameter | Units | 10535900020 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 11.8 | 12.3 | 4 | 30 | N2 |

SAMPLE DUPLICATE: 3770716

| Parameter | Units | 10535359003 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 45.7 | 46.0 | 1 | 30 | N2 |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 705578
QC Batch Method: EPA 5035/5030B
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV UST
Laboratory: Pace Analytical Services - Montana
Associated Lab Samples: 10535359001, 10535359002, 10535359003, 10535359004

METHOD BLANK: 3769696 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003, 10535359004

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/kg | <24.9 | 49.7 | 24.9 | 10/20/20 13:39 | |
| Ethylbenzene | ug/kg | <24.9 | 49.7 | 24.9 | 10/20/20 13:39 | |
| Toluene | ug/kg | <24.9 | 49.7 | 24.9 | 10/20/20 13:39 | |
| Xylene (Total) | ug/kg | <74.6 | 149 | 74.6 | 10/20/20 13:39 | |
| 1,2-Dichloroethane-d4 (S) | %. | 92 | 75-125 | | 10/20/20 13:39 | |
| 4-Bromofluorobenzene (S) | %. | 97 | 75-125 | | 10/20/20 13:39 | |
| Dibromofluoromethane (S) | %. | 90 | 75-125 | | 10/20/20 13:39 | |
| Toluene-d8 (S) | %. | 101 | 75-125 | | 10/20/20 13:39 | |

LABORATORY CONTROL SAMPLE: 3769697

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/kg | 926 | 692 | 75 | 61-127 | |
| Ethylbenzene | ug/kg | 926 | 784 | 85 | 69-125 | |
| Toluene | ug/kg | 926 | 785 | 85 | 69-125 | |
| Xylene (Total) | ug/kg | 2780 | 2410 | 87 | 71-125 | |
| 1,2-Dichloroethane-d4 (S) | %. | | | 85 | 75-125 | |
| 4-Bromofluorobenzene (S) | %. | | | 100 | 75-125 | |
| Dibromofluoromethane (S) | %. | | | 90 | 75-125 | |
| Toluene-d8 (S) | %. | | | 96 | 75-125 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769698 3769699

| Parameter | Units | 10535359001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ug/kg | <38.8 | 1640 | 1640 | 1200 | 1170 | 73 | 72 | 41-137 | 2 | 30 | |
| Ethylbenzene | ug/kg | <38.8 | 1640 | 1640 | 1340 | 1320 | 82 | 80 | 30-150 | 2 | 30 | |
| Toluene | ug/kg | <38.8 | 1640 | 1640 | 1370 | 1340 | 84 | 82 | 38-141 | 2 | 30 | |
| Xylene (Total) | ug/kg | <116 | 4910 | 4910 | 4080 | 4160 | 83 | 85 | 30-150 | 2 | 30 | |
| 1,2-Dichloroethane-d4 (S) | %. | | | | | | 85 | 92 | 75-125 | | | |
| 4-Bromofluorobenzene (S) | %. | | | | | | 99 | 97 | 75-125 | | | |
| Dibromofluoromethane (S) | %. | | | | | | 90 | 90 | 75-125 | | | |
| Toluene-d8 (S) | %. | | | | | | 101 | 100 | 75-125 | | | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 704319
QC Batch Method: EPA 3550C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E CPAH by SIM MSSV
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

METHOD BLANK: 3762883 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | ug/kg | <0.91 | 10.0 | 0.91 | 10/15/20 20:19 | |
| 3-Methylcholanthrene | ug/kg | <1.1 | 10.0 | 1.1 | 10/15/20 20:19 | |
| 5-Methylchrysene | ug/kg | <0.69 | 10.0 | 0.69 | 10/15/20 20:19 | |
| 7,12-Dimethylbenz(a)anthracene | ug/kg | <3.7 | 10.0 | 3.7 | 10/15/20 20:19 | |
| 7H-Dibenzo(c,g)carbazole | ug/kg | <1.3 | 10.0 | 1.3 | 10/15/20 20:19 | |
| Acenaphthene | ug/kg | <3.1 | 10.0 | 3.1 | 10/15/20 20:19 | |
| Acenaphthylene | ug/kg | <2.6 | 10.0 | 2.6 | 10/15/20 20:19 | |
| Anthracene | ug/kg | <1.6 | 10.0 | 1.6 | 10/15/20 20:19 | |
| Benzo(a)anthracene | ug/kg | <1.2 | 10.0 | 1.2 | 10/15/20 20:19 | |
| Benzo(a)pyrene | ug/kg | <0.90 | 10.0 | 0.90 | 10/15/20 20:19 | |
| Benzo(g,h,i)perylene | ug/kg | <1.3 | 10.0 | 1.3 | 10/15/20 20:19 | |
| Benzofluoranthenes (Total) | ug/kg | <2.4 | 30.0 | 2.4 | 10/15/20 20:19 | N2 |
| Chrysene | ug/kg | <1.4 | 10.0 | 1.4 | 10/15/20 20:19 | |
| Dibenz(a,h)acridine | ug/kg | <0.62 | 10.0 | 0.62 | 10/15/20 20:19 | |
| Dibenz(a,h)anthracene | ug/kg | <1.2 | 10.0 | 1.2 | 10/15/20 20:19 | |
| Dibenzo(a,e)pyrene | ug/kg | <1.3 | 10.0 | 1.3 | 10/15/20 20:19 | |
| Dibenzo(a,h)pyrene | ug/kg | <0.72 | 10.0 | 0.72 | 10/15/20 20:19 | |
| Dibenzo(a,i)pyrene | ug/kg | <1.0 | 10.0 | 1.0 | 10/15/20 20:19 | |
| Dibenzo(a,l)pyrene | ug/kg | <2.3 | 10.0 | 2.3 | 10/15/20 20:19 | |
| Fluoranthene | ug/kg | <2.0 | 10.0 | 2.0 | 10/15/20 20:19 | |
| Fluorene | ug/kg | <2.1 | 10.0 | 2.1 | 10/15/20 20:19 | |
| Indeno(1,2,3-cd)pyrene | ug/kg | <1.1 | 10.0 | 1.1 | 10/15/20 20:19 | |
| Naphthalene | ug/kg | <3.0 | 10.0 | 3.0 | 10/15/20 20:19 | |
| Phenanthrene | ug/kg | <1.7 | 10.0 | 1.7 | 10/15/20 20:19 | |
| Pyrene | ug/kg | <1.2 | 10.0 | 1.2 | 10/15/20 20:19 | |
| 2-Fluorobiphenyl (S) | %. | 76 | 42-125 | | 10/15/20 20:19 | |
| p-Terphenyl-d14 (S) | %. | 81 | 46-125 | | 10/15/20 20:19 | |

LABORATORY CONTROL SAMPLE: 3762884

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | ug/kg | 100 | 71.1 | 71 | 39-125 | |
| 3-Methylcholanthrene | ug/kg | 100 | 72.4 | 72 | 31-125 | |
| 5-Methylchrysene | ug/kg | 100 | 90.6 | 91 | 63-125 | |
| 7,12-Dimethylbenz(a)anthracene | ug/kg | 100 | 69.7 | 70 | 30-125 | |
| 7H-Dibenzo(c,g)carbazole | ug/kg | 100 | 89.4 | 89 | 59-125 | |
| Acenaphthene | ug/kg | 100 | 77.6 | 78 | 46-125 | |
| Acenaphthylene | ug/kg | 100 | 76.4 | 76 | 42-125 | |
| Anthracene | ug/kg | 100 | 83.3 | 83 | 56-125 | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

LABORATORY CONTROL SAMPLE: 3762884

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzo(a)anthracene | ug/kg | 100 | 82.4 | 82 | 61-125 | |
| Benzo(a)pyrene | ug/kg | 100 | 81.2 | 81 | 60-125 | |
| Benzo(g,h,i)perylene | ug/kg | 100 | 64.1 | 64 | 48-125 | |
| Benzofluoranthenes (Total) | ug/kg | 300 | 255 | 85 | 62-125 | N2 |
| Chrysene | ug/kg | 100 | 87.8 | 88 | 64-125 | |
| Dibenz(a,h)acridine | ug/kg | 100 | 89.2 | 89 | 60-125 | |
| Dibenz(a,h)anthracene | ug/kg | 100 | 87.8 | 88 | 58-125 | |
| Dibenzo(a,e)pyrene | ug/kg | 100 | 82.5 | 82 | 56-125 | |
| Dibenzo(a,h)pyrene | ug/kg | 100 | 88.1 | 88 | 56-125 | |
| Dibenzo(a,i)pyrene | ug/kg | 100 | 80.4 | 80 | 53-125 | |
| Dibenzo(a,l)pyrene | ug/kg | 100 | 57.4 | 57 | 30-125 | |
| Fluoranthene | ug/kg | 100 | 90.1 | 90 | 61-125 | |
| Fluorene | ug/kg | 100 | 82.2 | 82 | 52-125 | |
| Indeno(1,2,3-cd)pyrene | ug/kg | 100 | 85.4 | 85 | 58-125 | |
| Naphthalene | ug/kg | 100 | 70.3 | 70 | 37-125 | |
| Phenanthrene | ug/kg | 100 | 91.2 | 91 | 61-125 | |
| Pyrene | ug/kg | 100 | 85.4 | 85 | 61-125 | |
| 2-Fluorobiphenyl (S) | %. | | | 70 | 42-125 | |
| p-Terphenyl-d14 (S) | %. | | | 83 | 46-125 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3762885 3762886

| Parameter | Units | 10535359001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | ug/kg | 22.0J | 171 | 171 | 131J | 146J | 64 | 72 | 39-125 | | 30 | |
| 3-Methylcholanthrene | ug/kg | 38.0J | 171 | 171 | 111J | 123J | 42 | 50 | 30-134 | | 30 | |
| 5-Methylchrysene | ug/kg | 206 | 171 | 171 | 162J | 215 | -26 | 5 | 30-145 | | 30 | M6 |
| 7,12-Dimethylbenz(a)anthracene | ug/kg | <62.9 | 171 | 171 | <62.7 | <62.7 | 0 | 0 | 30-150 | | 30 | M6 |
| 7H-Dibenzo(c,g)carbazole | ug/kg | <22.5 | 171 | 171 | 115J | 110J | 67 | 64 | 30-140 | | 30 | |
| Acenaphthene | ug/kg | 130J | 171 | 171 | 231 | 253 | 59 | 72 | 37-125 | 9 | 30 | |
| Acenaphthylene | ug/kg | 69.1J | 171 | 171 | 185 | 197 | 68 | 75 | 40-125 | 6 | 30 | |
| Anthracene | ug/kg | 370 | 171 | 171 | 468 | 513 | 57 | 83 | 47-125 | 9 | 30 | |
| Benzo(a)anthracene | ug/kg | 1270 | 171 | 171 | 1400 | 1420 | 81 | 91 | 30-135 | 1 | 30 | |
| Benzo(a)pyrene | ug/kg | 1410 | 171 | 171 | 1460 | 1490 | 28 | 47 | 30-136 | 2 | 30 | M6 |
| Benzo(g,h,i)perylene | ug/kg | 139J | 171 | 171 | 173 | 179 | 20 | 24 | 30-127 | 3 | 30 | M6 |
| Benzofluoranthenes (Total) | ug/kg | 3380 | 514 | 514 | 3580 | 3640 | 39 | 51 | 34-125 | 2 | 30 | N2 |
| Chrysene | ug/kg | 1910 | 171 | 171 | 2000 | 2040 | 54 | 74 | 30-142 | 2 | 30 | |
| Dibenz(a,h)acridine | ug/kg | <10.6 | 171 | 171 | 151J | 163J | 88 | 95 | 30-148 | | 30 | |
| Dibenz(a,h)anthracene | ug/kg | 263 | 171 | 171 | 341 | 339 | 46 | 45 | 42-125 | 0 | 30 | |
| Dibenzo(a,e)pyrene | ug/kg | 346 | 171 | 171 | 367 | 345 | 12 | -1 | 30-131 | 6 | 30 | M6 |
| Dibenzo(a,h)pyrene | ug/kg | 142J | 171 | 171 | 177 | 176 | 20 | 20 | 30-141 | 1 | 30 | M6 |
| Dibenzo(a,i)pyrene | ug/kg | 36.6J | 171 | 171 | 66.9J | 73.6J | 18 | 22 | 30-131 | | 30 | M6 |
| Dibenzo(a,l)pyrene | ug/kg | <39.5 | 171 | 171 | <39.4 | 44.1J | 14 | 17 | 30-131 | | 30 | M6 |
| Fluoranthene | ug/kg | 4060 | 171 | 171 | 4200 | 4240 | 86 | 104 | 30-149 | 1 | 30 | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3762885 3762886

| Parameter | Units | 10535359001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluorene | ug/kg | 195 | 171 | 171 | 288 | 316 | 54 | 70 | 39-150 | 9 | 30 | |
| Indeno(1,2,3-cd)pyrene | ug/kg | 806 | 171 | 171 | 817 | 801 | 6 | -3 | 30-134 | 2 | 30 | M6 |
| Naphthalene | ug/kg | <50.9 | 171 | 171 | 135J | 143J | 64 | 69 | 37-125 | | 30 | |
| Phenanthrene | ug/kg | 2280 | 171 | 171 | 2250 | 2390 | -17 | 64 | 30-150 | 6 | 30 | M6 |
| Pyrene | ug/kg | 2920 | 171 | 171 | 2980 | 3020 | 35 | 59 | 30-150 | 1 | 30 | |
| 2-Fluorobiphenyl (S) | %. | | | | | | 69 | 71 | 42-125 | | | D3 |
| p-Terphenyl-d14 (S) | %. | | | | | | 66 | 67 | 46-125 | | | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

QC Batch: 704673
QC Batch Method: WI MOD DRO
Analysis Method: WI MOD DRO
Analysis Description: WIDRO Solid GCV
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535359001, 10535359002, 10535359003

METHOD BLANK: 3764539 Matrix: Solid
Associated Lab Samples: 10535359001, 10535359002, 10535359003

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| WDRO C10-C28 | mg/kg | <2.7 | 10.0 | 2.7 | 10/16/20 21:31 | |
| n-Triacontane (S) | %. | 121 | 30-150 | | 10/16/20 21:31 | |

LABORATORY CONTROL SAMPLE & LCSD: 3764540 3764541

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| WDRO C10-C28 | mg/kg | 80 | 75.1 | 74.8 | 94 | 93 | 66-125 | 1 | 20 | |
| n-Triacontane (S) | %. | | | | 103 | 102 | 30-150 | | | |

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## REPORT OF LABORATORY ANALYSIS

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

# QUALIFIERS

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

## DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

## ANALYTE QUALIFIERS

| | |
|---|---|
| D3 | Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference. |
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| G+ | Late peaks present outside the GRO window. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |
| M6 | Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. |
| N2 | The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request. |
| R1 | RPD value was outside control limits. |
| T6 | High boiling point hydrocarbons are present in the sample. |

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

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 23270051.51 Medley Park Pond
Pace Project No.: 10535359

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **10535359001** | **SED-01** | WI MOD DRO | 704673 | WI MOD DRO | 705083 |
| **10535359002** | **SED-02** | WI MOD DRO | 704673 | WI MOD DRO | 705083 |
| **10535359003** | **DUP-01** | WI MOD DRO | 704673 | WI MOD DRO | 705083 |
| **10535359001** | **SED-01** | EPA 5030 Medium Soil | 704364 | WI MOD GRO | 704432 |
| **10535359002** | **SED-02** | EPA 5030 Medium Soil | 704364 | WI MOD GRO | 704432 |
| **10535359003** | **DUP-01** | EPA 5030 Medium Soil | 704364 | WI MOD GRO | 704432 |
| **10535359004** | **Tip Blank** | EPA 5030 Medium Soil | 705230 | WI MOD GRO | 705305 |
| **10535359001** | **SED-01** | EPA 3050B | 704596 | EPA 6010D | 704831 |
| **10535359002** | **SED-02** | EPA 3050B | 704596 | EPA 6010D | 704831 |
| **10535359003** | **DUP-01** | EPA 3050B | 704596 | EPA 6010D | 704831 |
| **10535359001** | **SED-01** | EPA 7471B | 704597 | EPA 7471B | 704820 |
| **10535359002** | **SED-02** | EPA 7471B | 704597 | EPA 7471B | 704820 |
| **10535359003** | **DUP-01** | EPA 7471B | 704597 | EPA 7471B | 704820 |
| **10535359001** | **SED-01** | ASTM D2974 | 705751 | | |
| **10535359002** | **SED-02** | ASTM D2974 | 705751 | | |
| **10535359003** | **DUP-01** | ASTM D2974 | 705751 | | |
| **10535359001** | **SED-01** | EPA 3550C | 704319 | EPA 8270E by SIM | 704789 |
| **10535359002** | **SED-02** | EPA 3550C | 704319 | EPA 8270E by SIM | 704789 |
| **10535359003** | **DUP-01** | EPA 3550C | 704319 | EPA 8270E by SIM | 704789 |
| **10535359001** | **SED-01** | EPA 5035/5030B | 705578 | EPA 8260D | 705764 |
| **10535359002** | **SED-02** | EPA 5035/5030B | 705578 | EPA 8260D | 705764 |
| **10535359003** | **DUP-01** | EPA 5035/5030B | 705578 | EPA 8260D | 705764 |
| **10535359004** | **Tip Blank** | EPA 5035/5030B | 705578 | EPA 8260D | 705764 |

# Barr Engineering Co. Chain of Custody

Sample Origination State: ☐ CO ☐ MI ☒ MN ☐ MO ☐ ND ☐ TX ☐ UT ☐ WI ☐ Other: _____

COC Number: **№ 587760**

COC 1 of 1

| REPORT TO | INVOICE TO |
|---|---|
| Company: Barr Eng | Company: Barr Eng |
| Address: | Address: |
| Address: | Address: |
| Name: Kevin Menken | Name: Kevin Menken |
| email: kmenken@barr.com | email: |
| Copy to: BarrDM@barr.com | P.O. |
| Project Name: Medley Park Pond | Barr Project No: 23270051.51200 202 |

| Location | Sample Depth Start | Stop | Unit (m./ft. or in.) | Collection Date (mm/dd/yyyy) | Collection Time (hh:mm) | Matrix Code | Perform MS/MSD Y / N | Total Number Of Containers | Analysis Requested: Sed. (not Water) — cPAHs (stormwater pond list) | RCRA metals + copper | WI DRO 6-20 w silica gel cleanup | BTEX | Soil: % Solids | Preservative Code | Field Filtered Y/N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | A | A | A | F | F | | |
| 1. SED-01 | 0 | 2.7 | ft | 10/13/2020 | 10:30 | SD | N | 9 | X | X | X | X | X | X | 001 |
| 2. SED-02 | 0 | 4.0 | ft | ↓ | 11:30 | SD | N | 9 | X | X | X | X | X | X | 002 |
| 3. DUP-01 | | | | ↓ | | SD | N | 9 | X | X | X | X | X | X | 003 |
| 4. | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | |

WO#: 10535359

10535359

Matrix Code: GW = Groundwater; SW = Surface Water; WW = Waste Water; DW = Drinking Water; S = Soil/Solid; SD = Sediment; O = Other

Preservative Code: A = None; B = HCl; C = $HNO_3$; D = $H_2SO_4$; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; I = Ascorbic Acid; J = Zn Acetate; K = Other

**BARR USE ONLY**

Sampled by: Kevin Menken

Barr Proj. Manager: Katie Turpin-Nagel

Barr DQ Manager: Terri Olson

Lab Name: Pace

Lab Location: Mpls

Page 4 of 27

| Relinquished by: | On Ice? (Y) N | Date | Time | Received by: | Date | Time |
|---|---|---|---|---|---|---|
| Kevin Menken | (Y) N | 10/13/20 | 1330 | Pace | 10/13/20 | 1600 |
| Relinquished by: | On Ice? Y N | Date | Time | Received by: | Date | Time |

Samples Shipped VIA: ☒ Ground Courier ☐ Air Carrier ☐ Sampler ☐ Other: _____

Air Bill Number:

Lab WO: Temperature on Receipt (°C): 1.2 Custody Seal Intact? ☐ Y ☐ N ☐ None

**Requested Due Date:** ☒ Standard Turn Around Time ☐ Rush _____ (mm/dd/yyyy)

**Distribution - White-Original:** Accompanies Shipment to Laboratory; **Yellow Copy:** Include in Field Documents; **Scan and email:** a copy to BarrDM@barr.com for tracking and filing procedures

H:\RLG\STDFORMS\Chain of Custody Form 2015 RLG Rev. 01/30/2020

| Pace Analytical® | Document Name: **Sample Condition Upon Receipt (SCUR) - MN** | Document Revised: 12Aug2020 **Page 1 of 1** |
|---|---|---|
| | Document No.: **ENV-FRM-MIN4-0150 Rev.01** | Pace Analytical Services - **Minneapolis** |

**Sample Condition Upon Receipt** **Client Name:** Barr **Project #:** WO#: 10535359

PM: AA1 Due Date: 10/27/20
CLIENT: BARR

**Courier:** ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☒ Commercial

**Tracking Number:** _____ See Exceptions ☐ ENV-FRM-MIN4-0142

**Custody Seal on Cooler/Box Present?** ☐ Yes ☐ No **Seals Intact?** ☐ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

**Packing Material:** ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

**Thermometer:** ☐ T1(0461) ☒ T2(1336) ☐ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

**Did Samples Originate in West Virginia?** ☐ Yes ☒ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.2 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

**Correction Factor:** true **Cooler Temp Corrected w/temp blank:** 1.2 °C

**USDA Regulated Soil:** ( ☐ N/A, water sample/Other: _____ ) **Date/Initials of Person Examining Contents:** M 10/20/20

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☒ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | COMMENTS: |
|---|---|---|---|---|
| Chain of Custody Present and Filled Out? | ☒ Yes | ☐ No | | 1. |
| Chain of Custody Relinquished? | ☒ Yes | ☐ No | | 2. |
| Sampler Name and/or Signature on COC? | ☒ Yes | ☐ No | ☐ N/A | 3. |
| Samples Arrived within Hold Time? | ☒ Yes | ☐ No | | 4. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☒ No | | 5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____ |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☒ No | | 6. |
| Sufficient Volume? | ☒ Yes | ☐ No | | 7. |
| Correct Containers Used? -Pace Containers Used? | ☒ Yes ☒ Yes | ☐ No ☐ No | | 8. |
| Containers Intact? | ☒ Yes | ☐ No | | 9. |
| Field Filtered Volume Received for Dissolved Tests? | ☐ Yes | ☐ No | ☒ N/A | 10. Is sediment visible in the dissolved container? ☐ Yes ☐ No |
| Is sufficient information available to reconcile the samples to the COC? | ☒ Yes | ☐ No | | 11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142** |
| Matrix: ☐ Water ☒ Soil ☐ Oil ☐ Other _____ | | | | |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☒ N/A | 12. Sample # |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide) | ☐ Yes | ☐ No | ☒ N/A | ☐ NaOH ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ Zinc Acetate |
| Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS | ☐ Yes | ☐ No | ☒ N/A | Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142** |
| | | | | Res. Chlorine \| 0-6 Roll \| 0-6 Strip \| 0-14 Strip |
| Extra labels present on soil VOA or WIDRO containers? | ☐ Yes | ☐ No | ☒ N/A | 13. **See Exception** ☐ **ENV-FRM-MIN4-0140** |
| Headspace in VOA Vials (greater than 6mm)? | ☐ Yes | ☐ No | ☒ N/A | |
| Trip Blank Present? | ☒ Yes | ☐ No | ☐ N/A | 14. Pace Trip Blank Lot # (if purchased): 060120-3 (2) |
| Trip Blank Custody Seals Present? | ☒ Yes | ☐ No | ☐ N/A | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

**Project Manager Review:** _____ **Date:** 10/14/20

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

Labeled by: RVC

# Intra-Regional Chain of Custody

Pace Analytical®
www.pacelabs.com

**Workorder:** 10535359 **Workorder Name:** 23270051.51 2 Medley Park Pond **Owner Received Date:** 10/13/2020 **Due Date:** 10/26/2020

| Received at: | Send To Lab: |
|---|---|
| Pace Analytical Minnesota<br>1700 Elm Street<br>Suite 200<br>Minneapolis, MN 55414<br>Phone (612)607-6382 | Pace Analytical Billings MT<br>150 N Ninth Street<br>Billings, MT 59101<br>Phone (406)254-7226 |

Report To:
Amanda Albrecht

| Item | Sample ID | Sample Type | Collect Date/Time | Lab ID | Matrix | Preserved Containers: VG9M MeOH | Requested Analysis: EPA 8260D | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|
| 1 | SED-01 | PS | 10/13/2020 10:30 | 10535359001 | Solid | 2 | X | 001 |
| 2 | SED-02 | PS | 10/13/2020 11:30 | 10535359002 | Solid | 2 | X | 002 |
| 3 | DUP-01 | PS | 10/13/2020 00:00 | 10535359003 | Solid | 2 | X | 003 |
| 4 | Tip Blank | PS | 10/13/2020 00:00 | 10535359004 | Solid | 1 | X | 004 |
| 5 | | | | | | | | 005 |

| Transfers | Released By | Date/Time | Received By | Date/Time |
|---|---|---|---|---|
| 1 | [signature] Pace | 10/14/20 1555 | | |
| 2 | Waltco | 10/15/20 0910 | [signature] Pace | 10/15/20 0910 |
| 3 | FedEx | | [signature] Pace | 10/16/20 0920 |
| 4 | | | | |

**Comments**

**Cooler Temperature on Receipt** 1.5 °C 0.6 **Custody Seal** (Y) or N **Received on Ice** (Y) or N **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

| Pace Analytical® | Document Name: **Sample Condition Upon Receipt Form** | Document Revised: 18Aug2020 Page 1 of 1 |
|---|---|---|
| | Document No.: **F-MT-C-184-Rev.16** | Issuing Authority: Pace Montana Quality Office |

**Sample Condition Upon Receipt**

**Client Name:** 10/16/20 ct Pace GB MN

**Project #:** 10533559

**Courier:** ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

**Tracking Number:** 4276 9155 4436

**Custody Seal on Cooler/Box Present?** ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Optional:** Proj. Due Date: Proj. Name:

**Packing Material:** ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☒ Yes ☐ No

**Thermometer Used:** ☒ 160285052 ☐ OS418-LS **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

**Cooler Temp Read:** 0.6 (°C) **Date and Initials of Person Examining Contents:** 10/16/20 ct

**Cooler Temp Corrected:** 0.6 (°C) **Biological Tissue Frozen?** ☐ Yes ☒ No

**USDA Regulated Soil** ☐ Yes ☒ No

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA? Check maps & Circle State

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

| | | | | Comments: |
|---|---|---|---|---|
| Chain of Custody Present? | ☒ Yes | ☐ No | ☐ N/A | 1. |
| Chain of Custody Filled Out? | ☒ Yes | ☐ No | ☐ N/A | 2. |
| Chain of Custody Relinquished? | ☒ Yes | ☐ No | ☐ N/A | 3. |
| Sampler Name and Signature on COC? | ☐ Yes | ☐ No | ☒ N/A | 4. |
| Samples Arrived within Hold Time? | ☒ Yes | ☐ No | ☐ N/A | 5. |
| **Short Hold Time Analysis (<72 hr)?** | ☐ Yes | ☒ No | ☐ N/A | 6. |
| **Rush Turn Around Time Requested?** | ☐ Yes | ☒ No | ☐ N/A | 7. 10/26/20 |
| Sufficient Volume? | ☒ Yes | ☐ No | ☐ N/A | 8. |
| Correct Containers Used? | ☒ Yes | ☐ No | ☐ N/A | 9. |
| -Pace Containers Used? | ☒ Yes | ☐ No | ☐ N/A | |
| Containers Intact? | ☒ Yes | ☐ No | ☐ N/A | 10. |
| Filtered Volume Received for Dissolved Tests? Note if sediment is visible in the dissolved container. | ☐ Yes | ☐ No | ☒ N/A | 11. |
| Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL | ☒ Yes | ☐ No | ☐ N/A | 12. |
| All containers needing acid/base preservation have been checked? | ☐ Yes | ☐ No | ☒ N/A | 13. ☐ $HNO_3$ ☐ $H_2SO_4$ ☐ NaOH ☐ HCl ☐ NaOH+ZnAce |
| All containers needing preservation are found to be in compliance with EPA recommendation? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) | ☐ Yes | ☐ No | ☒ N/A | Sample # |
| Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water) | ☐ Yes | ☒ No | | Initial when completed: Lot # of added preservative: |
| Headspace in VOA Vials ( >6mm)? | ☐ Yes | ☐ No | ☒ N/A | 14. |
| Trip Blank Present? | ☐ Yes | ☐ No | ☒ N/A | 15. |
| Trip Blank Custody Seals Present? | ☐ Yes | ☐ No | ☒ N/A | |
| Pace Trip Blank Lot # (if purchased): NA | | | | |

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?** ☐ Yes ☐ No

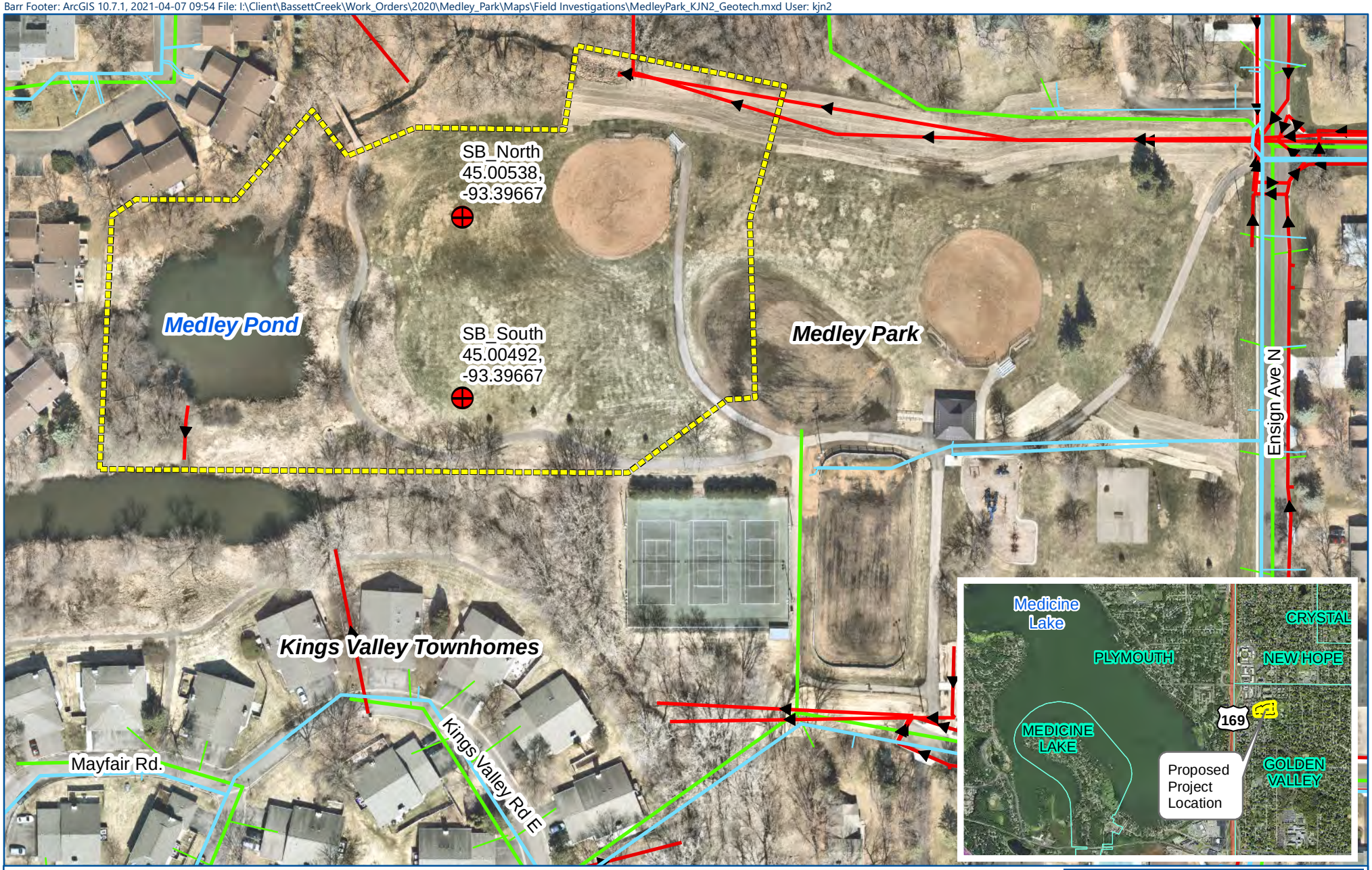
Person Contacted: Date/Time:

Comments/Resolution:

**Project Manager Review:** **Date:** 10/23/20

# Appendix B

## Geotechnical Soil Boring Logs (2020)




Soil Boring Locations
Project Boundary
Storm Pipe*
Watermain*
Sanitary Main*

*Utility pipes shown on this figure are not all inclusive. A Gopher State One Call for utility locates was performed prior to geotechnical investigation.

N

0 120
Feet

# MEDLEY PARK
# SOIL BORING LOCATIONS

FIGURE B1

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

# LOG OF BORING SB-North



Project: Medley Park
Project No.: 23270051.51
Location: Golden Valley, MN
Coordinates: Lat: 45.00538° Long: -93.39667°
Datum: NAD83

Surface Elevation: 906.3 (NAVD88)
Drilling Method: HSA
Sampling Method: SS
Completion Depth: 12.0 ft

| Depth, feet | Sample Type & Recovery | Sample No. | Blows/6in. | ENVIRONMENTAL DATA | USCS | Graphic Log | LITHOLOGIC DESCRIPTION | Elevation, feet |
|---|---|---|---|---|---|---|---|---|
| 0.0 | | 1 | 2-3-3-. | **PID:**3.6 | SM | | SILTY SAND (SM): very fine to fine grained; light brown; moist; loose; trace gravel; no odor; no sheen; no discoloration. | |
| | | 2 | 2-2-3-. | **PID:**4.8 | OL | | ORGANIC SILT (OL): brown; moist; medium stiff; with fine grain sand; organic; no odor; no sheen; no discoloration. | |
| 2.5 | | 3 | 1-1-2-. | **PID:**4.8 | CL | | LEAN CLAY (CL): olive gray; moist; medium stiff to stiff; trace fine grain sand and fibrous; no odor; no sheen; no discoloration. | |
| 5.0 | | 4 | 2-2-3-. | **PID:**4.0 | | | | |
| | | 5 | 4-4-5-. | **PID:**4.0 | | | | |
| 7.5 | | 6 | 2-2-3-. | **PID:**5.2 | | | | |
| | | 7 | 1-1-1-. | **PID:**3.8 | PT | | PEAT (PT): brown; moist; soft; organic and fibrous; no odor; no sheen; no discoloration. | |
| 10.0 | | 8 | 1-2-2-. | **PID:**2.3 | | | | |
| 12.5 | | | | | | | End of boring 12.0 feet | |
| 15.0 | | | | | | | | |

Date Boring Started: 10/6/20
Date Boring Completed: 10/6/20
Logged By: JWJ
Drilling Contractor: Haugo
Drill Rig: Truck

Remarks: Borehole was drilled with 4-1/4 HSA from 0-12 feet. Borehole was abandoned with soil.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

# LOG OF BORING SB-South



Project: Medly Park
Project No.: 23270051.51
Location: Golden Valley, MN
Coordinates: Lat: 45.00492° Long: -93.39667°
Datum: NAD83

Surface Elevation: 907.7 (NAVD88)
Drilling Method: HSA
Sampling Method: SS
Completion Depth: 12.0 ft

| Depth, feet | Sample Type & Recovery | Sample No. | Blows/6in. | ENVIRONMENTAL DATA | USCS | Graphic Log | LITHOLOGIC DESCRIPTION | Elevation, feet |
|---|---|---|---|---|---|---|---|---|
| 0.0 | | 1 | 1-3-3-. | **PID:**5.9 | OL | | ORGANIC SILT (OL): black; moist; medium stiff; topsoil; black organics; no odor; no sheen; no discoloration. | |
| 2.5 | | 2 | 2-2-4-. | **PID:**6.6 | CL | | LEAN CLAY (CL): black to olive gray; moist; stiff; trace peat; trace very fine to fine grained sand; no odor; no sheen; no discoloration. | |
| | | 3 | 2-2-5-. | **PID:**6.2 | | | | |
| 5.0 | | 4 | 2-2-3-. | | | | 4.5-6 feet: no recovery, 2 inch gravel chunk in sampler shoe. | |
| | | 5 | 2-2-2-. | **PID:**6.3 | | | | |
| 7.5 | | 6 | 1-2-2-. | **PID:**6.3 | PT | | PEAT (PT): brown; moist; soft; fibrous organics; no odor; no sheen; no discoloration. | |
| 10.0 | | 7 | 1-2-2-. | **PID:**6.3 | | | | |
| | | 8 | 2-1-1-. | **PID:**5.9 | CL | | LEAN CLAY (CL): olive gray; wet; soft; with very fine to fine grained sand; no odor; no sheen; no discoloration. | |
| 12.5 | | | | | | | End of boring 12.0 feet | |
| 15.0 | | | | | | | | |

Date Boring Started: 10/6/20
Date Boring Completed: 10/6/20
Logged By: JWJ
Drilling Contractor: Haugo
Drill Rig: Truck

Remarks: Borehole was drilled with 4-1/4 HSA from 0-12 feet. Borehole was abandoned with soil.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

# Appendix C

## Wetland Delineation Report (2020)

# Draft Wetland Delineation Report

## *Medley Park*

Prepared for
City of Golden Valley

October 2020

# Draft Wetland Delineation Report

## *Medley Park*

Prepared for
City of Golden Valley

October 2020

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
952.832.2600
www.barr.com

# Wetland Delineation Report

## October 2020

# Contents

## List of Tables



## List of Figures



## List of Appendices

# 1.0 Introduction

This wetland delineation report has been prepared by Barr Engineering Co., (Barr) on behalf of the City of Golden Valley in support of the Medley Park Stormwater Project. The project area is located in Medley Park in the City of Golden Valley, Minnesota in Section 30 of Township 118 North, Range 21 West (**Figure 1**). A field wetland delineation was conducted by Barr for the proposed project on September 14, 2020. This delineation identified one wetland within the project area.

This Wetland Delineation Report has been prepared in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual ("1987 Manual", USACE, 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010) and the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991.

This report includes general environmental information (Section 2.0), descriptions of the delineated wetlands (Section 3.0), and a discussion of regulations and the administering authorities (Section 4.0). The Tables section includes antecedent precipitation data. The Figures section includes the Project Location Map, Topography Map, National Wetland Inventory (NWI), Public Waters Inventory (PWI), Hydric Soils Map, Historic Aerial Imagery, and the Wetland Delineation Map. **Appendix A** includes Wetland Data Forms and **Appendix B** includes site photographs.

# 2.0 General Environmental Setting

## 2.1 Site Description

The project area is located within the Medley Park, just east of Highway 169 (**Figure 1**). The park is in a residential setting and can be accessed through a system of paved trails from the north and east side of the project area. The park includes a variety of amenities such as play structures, two baseball fields, tennis courts and an ice-skating rink. The project area is also used for stormwater management, with a stormwater detention basin located on the west side of the project area.

## 2.2 Topography

The project area is in an urban setting where the natural topography has been altered. Generally, The topography of the project area consists of gentle slopes from the eastern side with a high elevation of 910 feet MSL to the western side with a low elevation of 900 feet MSL (**Figure 2**).

## 2.3 Precipitation

Recent precipitation data was compared to historic precipitation data to evaluate monthly deviations from normal conditions. Precipitation data was obtained from the Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database (Minnesota Climatology Office, 2020) for wetlands in Hennepin County, Township 118 North, Range 21 West, Section 30.

Antecedent moisture conditions were within the normal range according to precipitation data from the three months prior to the September 14, 2020, site visit (**Table 1**). During the month of August, the City of Golden Valley received around 5.11 inches of precipitation, which is within the normal range for August. In July the area received below-average levels of precipitation while June was within the normal range. The water year has varied between dry and wet for the past nine years but fell mostly into the wet range from 2016 through 2019 (**Table 2**).

**Table 1, Antecedent Moisture Conditions**

**Score using 1981-2010 normal period**

| (value are in inches) | first prior month: **August 2020** | second prior month: **July 2020** | third prior month: **June 2020** |
|---|---|---|---|
| estimated precipitation total for this location: | 5.11R | 2.82R | 3.72R |
| there is a 30% chance this location will have less than: | 3.40 | 2.82 | 3.38 |
| there is a 30% chance this location will have more than: | 5.18 | 4.21 | 5.26 |
| type of month: **dry** **normal** **wet** | **normal** | **dry** | **normal** |
| monthly score | 3 * **2** = 6 | 2 * **1** = 2 | 1 * **2** = 2 |
| multi-month score: 6 to 9 (**dry**) 10 to 14 (**normal**) 15 to 18 (**wet**) | **10 (normal)** | | |

*"R" following a monthly total indicates a provisional value derived from radar-based estimates

**Table 2 Precipitation in comparison to WETS data**

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

**Period-of-Record Summary Statistics**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | WARM | ANN | WAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30% | 0.53 | 0.52 | 1.16 | 1.63 | 2.58 | 3.20 | 2.43 | 2.81 | 1.84 | 1.22 | 0.71 | 0.59 | 16.39 | 26.08 | 25.91 |
| 70% | 1.07 | 1.18 | 2.06 | 2.80 | 4.25 | 5.36 | 4.44 | 4.57 | 3.88 | 2.74 | 1.89 | 1.37 | 21.46 | 32.82 | 32.03 |
| mean | 0.89 | 0.91 | 1.67 | 2.42 | 3.70 | 4.44 | 3.84 | 3.71 | 3.08 | 2.25 | 1.54 | 1.06 | 18.77 | 29.51 | 29.53 |

**1981-2010 Summary Statistics**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | WARM | ANN | WAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30% | 0.54 | 0.40 | 1.34 | 2.27 | 2.88 | 3.38 | 2.82 | 3.40 | 2.21 | 1.23 | 1.09 | 0.74 | 18.44 | 30.35 | 27.90 |
| 70% | 1.24 | 1.04 | 2.15 | 3.01 | 4.15 | 5.26 | 4.21 | 5.18 | 4.00 | 3.69 | 2.07 | 1.45 | 21.81 | 34.34 | 35.68 |
| mean | 0.88 | 0.81 | 1.94 | 2.78 | 3.66 | 4.59 | 4.27 | 4.16 | 3.41 | 2.54 | 1.84 | 1.24 | 20.09 | 32.12 | 31.93 |

**Year-to-Year Data**

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | WARM | ANN | WAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020 | 0.93 | 0.52 | 2.24R | 1.53R | 4.10R | 3.72R | 2.82R | 5.11R | | | | | | | |
| 2019 | 0.53 | 2.26 | 2.30 | 3.56 | 7.45 | 2.75 | 6.43 | 6.60 | 4.74 | 5.12 | 1.55 | 2.17 | 27.97 | 45.46 | 43.02 |
| 2018 | 0.94 | 1.34 | 1.33 | 2.20 | 2.43 | 4.30 | 3.62 | 3.29 | 6.21 | 3.35 | 1.48 | 1.57 | 19.85 | 32.06 | 32.11 |
| 2017 | 0.76 | 0.72 | 0.70 | 3.51 | 6.31 | 3.82 | 3.94 | 6.93 | 1.70 | 5.34 | 0.40 | 0.71 | 22.70 | 34.84 | 36.17 |
| 2016 | 0.30 | 0.84 | 1.60 | 3.74 | 2.22 | 3.09 | 5.78 | 9.89 | 6.43 | 3.20 | 2.58 | 2.00 | 27.41 | 41.67 | 42.66 |
| 2015 | 0.33 | 0.30 | 0.67 | 2.05 | 4.19 | 3.31 | 7.30 | 3.40 | 3.92 | 2.74 | 4.31 | 1.72 | 22.12 | 34.24 | 28.73 |
| 2014 | 1.23 | 1.38 | 0.76 | 7.26 | 4.33 | 10.49 | 3.07 | 3.15 | 1.59 | 1.10 | 1.10 | 1.06 | 22.63 | 36.52 | 39.91 |
| 2013 | 0.69 | 1.19 | 2.07 | 4.57 | 4.86 | 7.79 | 4.76 | 1.53 | 1.29 | 4.40 | 0.59 | 1.66 | 20.23 | 35.40 | 32.71 |
| 2012 | 0.50 | 2.14 | 1.35 | 2.91 | 9.35 | 4.13 | 4.23 | 1.46 | 0.52 | 1.38 | 0.92 | 1.66 | 19.69 | 30.55 | 28.63 |
| 2011 | 0.96 | 0.96 | 2.18 | 3.18 | 6.11 | 4.06 | 6.74 | 4.07 | 0.44 | 0.94 | 0.20 | 0.90 | 21.42 | 30.74 | 36.04 |
| 2010 | 0.61 | 0.89 | 0.97 | 2.04 | 2.75 | 6.18 | 4.00 | 5.92 | 6.00 | 2.02 | 2.01 | 3.31 | 24.85 | 36.70 | 38.08 |
| 2009 | 0.49 | 1.04 | 1.97 | 1.37 | 0.40 | 3.67 | 1.00 | 6.55 | 0.79 | 5.91 | 0.60 | 2.21 | 12.41 | 26.00 | 21.57 |
| 2008 | 0.14 | 0.52 | 2.12 | 4.20 | 2.58 | 4.24 | 2.13 | 2.82 | 2.15 | 1.54 | 1.22 | 1.53 | 13.92 | 25.19 | 28.05 |
| 2007 | 0.58 | 1.42 | 3.63 | 2.41 | 3.02 | 2.06 | 2.58 | 6.72 | 4.87 | 5.22 | 0.10 | 1.83 | 19.25 | 34.44 | 31.67 |
| 2006 | 0.71 | 0.39 | 1.80 | 3.27 | 3.66 | 4.14 | 2.39 | 5.73 | 3.14 | 0.67 | 1.09 | 2.62 | 19.06 | 29.61 | 32.82 |
| 2005 | 1.27 | 1.04 | 1.30 | 2.60 | 3.56 | 6.21 | 2.80 | 3.63 | 6.63 | 4.43 | 1.75 | 1.41 | 22.83 | 36.63 | 34.41 |
| 2004 | 0.55 | 1.54 | 2.23 | 2.78 | 5.80 | 4.85 | 3.82 | 1.47 | 4.66 | 3.80 | 1.09 | 0.48 | 20.60 | 33.07 | 30.79 |
| 2003 | 0.28 | 0.99 | 1.68 | 2.93 | 5.31 | 7.92 | 1.74 | 0.28 | 2.23 | 0.95 | 1.17 | 0.97 | 17.48 | 26.45 | 27.55 |
| 2002 | 0.60 | 0.57 | 1.98 | 4.11 | 4.19 | 8.40 | 6.38 | 6.59 | 4.11 | 3.84 | 0.08 | 0.27 | 29.67 | 41.12 | 41.66 |
| 2001 | 1.39 | 1.42 | 1.03 | 7.29 | 5.57 | 4.87 | 2.38 | 3.14 | 3.95 | 0.91 | 3.18 | 0.64 | 19.91 | 35.77 | 37.48 |

## 2.4 National Wetland Inventory

The National Wetland Inventory (NWI) data was reviewed for any wetlands located within or adjacent to the project area. Two NWI wetlands are mapped on the western side of the project area. The northern most NWI is classified as a freshwater pond with a freshwater emergent wetland connected to the north

(PUBH/EM1A**; Figure 3**). The southern most wetland is classified as a freshwater pond with a freshwater forested/emergent wetland around the parameter (PUBH/PFO1/EM1A).

## 2.5 Water Resources

The Minnesota Department of Natural Resources (MnDNR) Public Water Inventory (PWI) was queried for any Public Waters located within or adjacent to the project area (**Figure 4**). No PWI watercourses or PWI basins are located within the project area. The nearest PWI basin is Medicine Lake located approximately 0.31 miles west of the project area.

## 2.6 Soil Resources

Soil information for the wetland delineation area was obtained from the Soil Survey for Hennepin County, Minnesota (USDA, 2004). Three soils are mapped within the project area; Urban land Udorthents wet substratum complex, Udorthents wet substratum, and urban land-udorthents (Cut and fill land). All of these soils are classified as non-hydric soils (**Figure 5)**.

## 2.7 Historic Aerial Imagery Review

Historic aerial imagery of the project area  was reviewed for the presence of wetland signatures. Aerial imagery from 1937, 1956, 1971, 1991 and 2017 was reviewed.  In 1937the project area appears to have been used for agricultural practices, no wetland signatures were identified within the project area.  In 1971, the project area is still used for agricultural practices however the crops located in the western portion of the project area appear to be stunted and a wetland signature is present in the northwestern corner of the evaluation area.  By 1991 a wetland appears in the western side of the project area.  The wetland is of similar size and shape in the 2017 aerial imagery.

# 3.0 Wetland Delineation

## 3.1 Wetland Delineation and Classification Methods

The wetland delineation was completed according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE, 2010) and the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991.

The delineated wetland boundaries and associated sample points were surveyed using a Global Positioning System (GPS) with sub-meter accuracy. Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin System (Cowardin et al., 1979), the USFWS Circular 39 system (Shaw and Fredine, 1956), and the Eggers and Reed Wetland Classification System (Eggers and Reed, 2015).

Two soil samples were collected to examine for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 8.2). Hydrologic conditions were evaluated at each soil boring. Additionally, the dominant plant species were identified, and the

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

## 3.2 Aquatic Resources

During the wetland delineation, one wetland totaling 0.82 acres was delineated within the project area (**Table 3**). Descriptions and assessments of the wetland areas are provided below, with representative photographs in **Appendix B**.

**Table 3: Delineated Wetlands**

| Wetland Number | Sample Point Number | Circular 39 | Cowardin Classification | Eggers and Reed | Wetland Size (Acres) |
|---|---|---|---|---|---|
| Wetland 1 | SP 1 | Type 3/4 | PUBGx/PEMC | Shallow Marsh/Deep marsh | 0.82 |

Wetland 1 is a storm water detention basin that is separated into two segments by an upland berm. The two wetland segments are connected through a culvert located underneath the berm. Both segments of the wetland were classified as a deep marsh boarded with a seasonally flooded basin (PUBGx/PEMC; **Figure 7**). Vegetation along the wetland boundary was dominated by cattails (*typha spp.*;OBL), boarded by reed canarygrass (*Phalaris arundinacea*; FACW), jewel weed (*Impatiens capensis*; FACU), water smartweed (*Persicaria amphibia*; OBL), in addition to woody vegetation such as boxelder (*Acer negundo*; FAC) and common buckthorn (*Rhamnus cathartica*; FAC). floating vegetation like duck weed ( observed within the deep marsh portion of the wetland.

At the time of the field survey, much of the wetland area was inundated with approximately 4-6 feet of water. The area receives water from a drainage channel located on the northern end of the wetland boundary. Water flows from the northern wetland area into the wetland area to the south and outside of the project area. At sample point 1, two primary hydrology indicators were observed, including saturation (A3), inundation visible on aerial imagery (B7).

According to NRCS data, the soils mapped within the boundary of Wetland 1 are classified as Urban land-Udorthents, Wet Substratum Complex, a non-hydric soil. Sampled soils consisted of a very dark grayish brown (10YR 3/2) matrix color from the soil surface down to approximately 4 inches. A depleted grayish brown (2.5Y 5/2) matrix is present starting at 4 inches below ground surface with 10 percent distinct prominent redoximorphic features. A gleyed matrix with a dark greenish gray (10Y 4/1) color was found 8 inches below the soil surface. The soils at Sample Point 1 met the loamy gleyed matrix (F2) and redox dark surface (F6) hydric soil indicators.

The transition to upland was defined by a sudden change in topography around the perimeter of the wetland. The vegetation in the adjacent upland area consisted of woody vegetation along the side slopes of the wetland with maintained grassland.

Using the MnRAM wetland assessment methodology, the wetland area was classified as a Manage 2 wetland. As the wetland is rated low for amphibian habitat . See the attached for the MnRAM Excel spreadsheet.

# 4.0 Regulatory Overview

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

Filling, excavating, and draining wetlands are also regulated by the Minnesota Wetland Conservation Act (WCA), and the Minnesota Public Waters Inventory Program, which are administered by the City of Golden Valley and the MnDNR. The City of Golden Valley, MnDNR, and the USACE, should be contacted before altering any aquatic resources in the project area. Delineated wetland boundaries may be reviewed, if needed, by a Technical Evaluation Panel (TEP) consisting of representatives from the Minnesota Board of Water and Soil Resources (BWSR), Hennepin County, and the City of Golden Valley, along with the USACE.

# 5.0 References


Cowardin, L.M., V. Carter, F.C. Golet, and R.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, FWS/OBS079/31, 103 pp.

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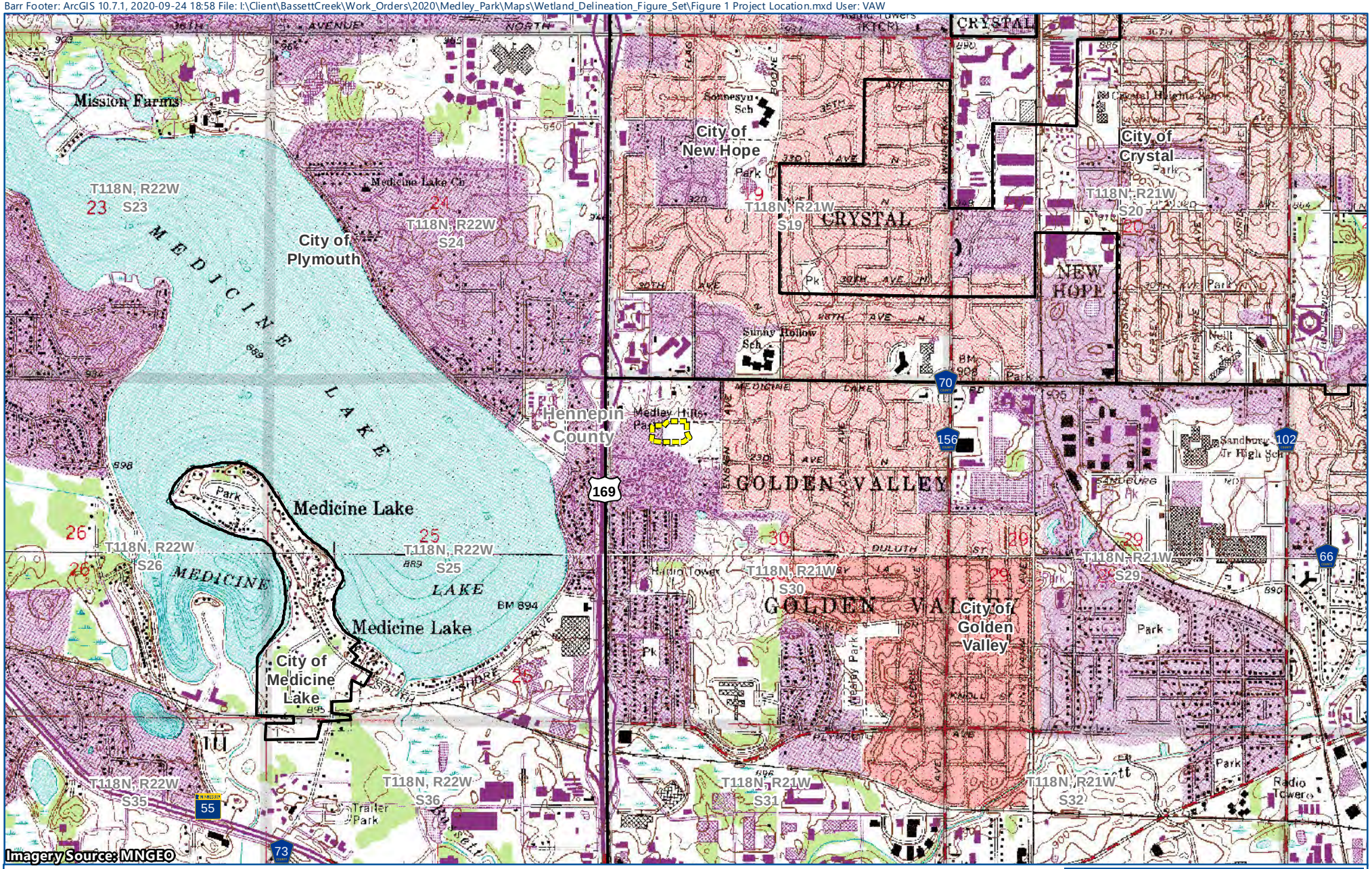
U.S. Fish and Wildlife Service. 1956. *Wetlands of the United States Circular 39*. U.S. Government Printing Office, Washington, D.C.

# Figures




Project Boundary

N

0 2,000 4,000

Feet

1 inch = 2,000 feet

PROJECT LOCATION
Medley Park Stormwater Treatment Facility
Golden Valley, MN

FIGURE 1

Barr Footer: ArcGIS 10.7.1, 2020-09-24 18:20 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Wetland_Delineation_Figure_Set\Figure 2 LiDAR Map.mxd User: VAW


**Elevation**

- Index Contour (10' Interval)
- Intermediate Contour (2' Interval)
- Project Boundary

N

0 120 240

Feet

1 inch = 120 feet

LIDAR MAP
Medley Park Stormwater Treatment Facility
Golden Valley, MN

FIGURE 2

Barr Footer: ArcGIS 10.7.1, 2020-09-24 19:17 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Wetland_Delineation_Figure_Set\Figure 3 NWI Map.mxd User: VAW


Project Boundary

**Wetlands (National Wetlands Inventory)**

- Freshwater Emergent Wetland (PEM1A)
- Freshwater Forested/Emergent Wetland (PFO1/EM1A)
- Freshwater Pond (PUBH)

N

0 120 240

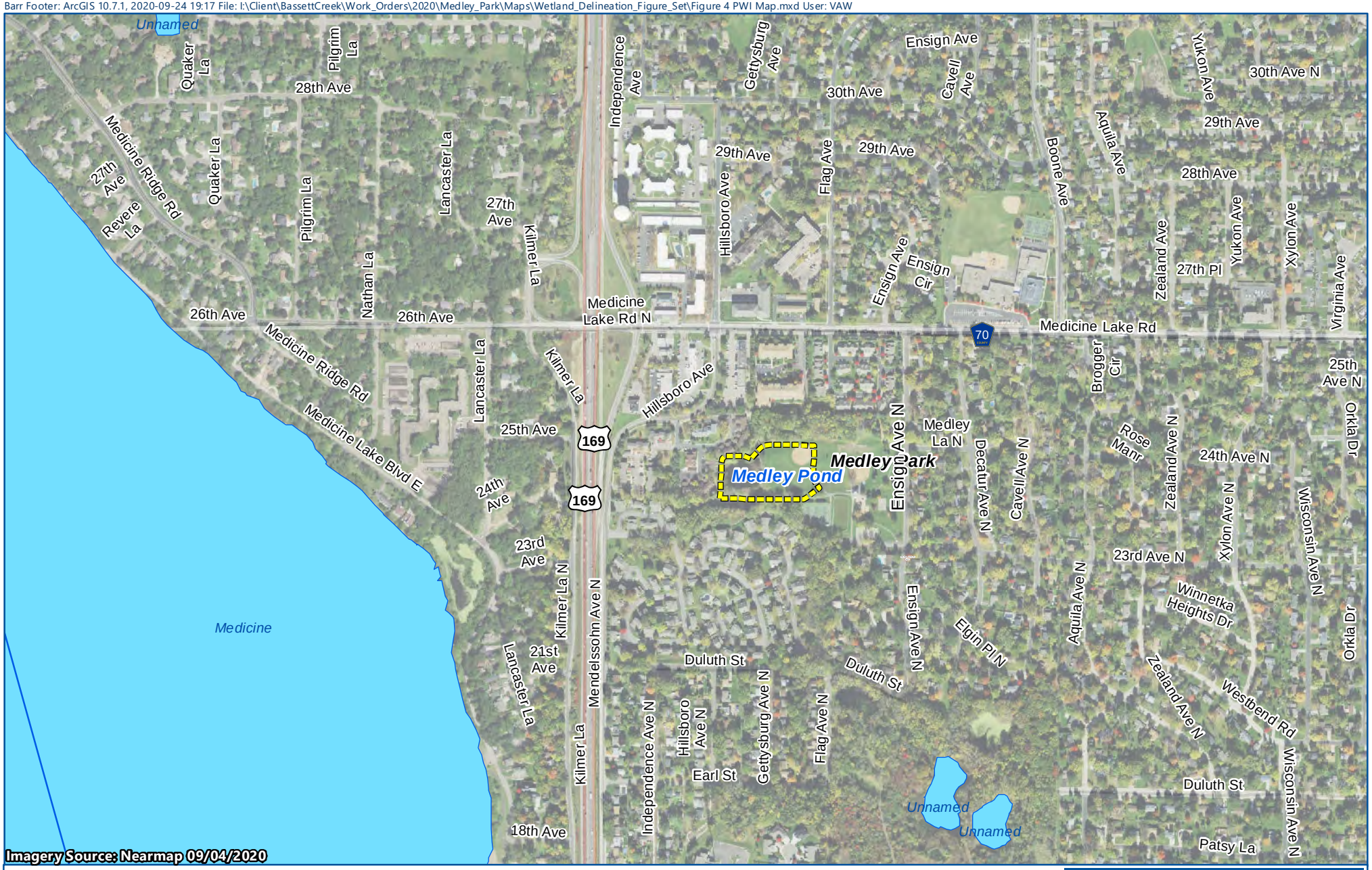
Feet

1 inch = 120 feet

# NWI MAP
## Medley Park Stormwater Treatment Facility
## Golden Valley, MN

FIGURE 3

Barr Footer: ArcGIS 10.7.1, 2020-09-24 19:17 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Wetland_Delineation_Figure_Set\Figure 4 PWI Map.mxd User: VAW




Project Boundary
Public Water Inventory Watercourses.lyr
Public Water Inventory Basins.lyr

N

0 0.25 0.5
Miles

1 inch = 755 feet

BARR

PWI MAP
Medley Park Stormwater Treatment Facility
Golden Valley, MN

FIGURE 4


Project Boundary **Hydric Rating**

Soil Boundary Not Hydric (0%)

BARR

N

0 120 240

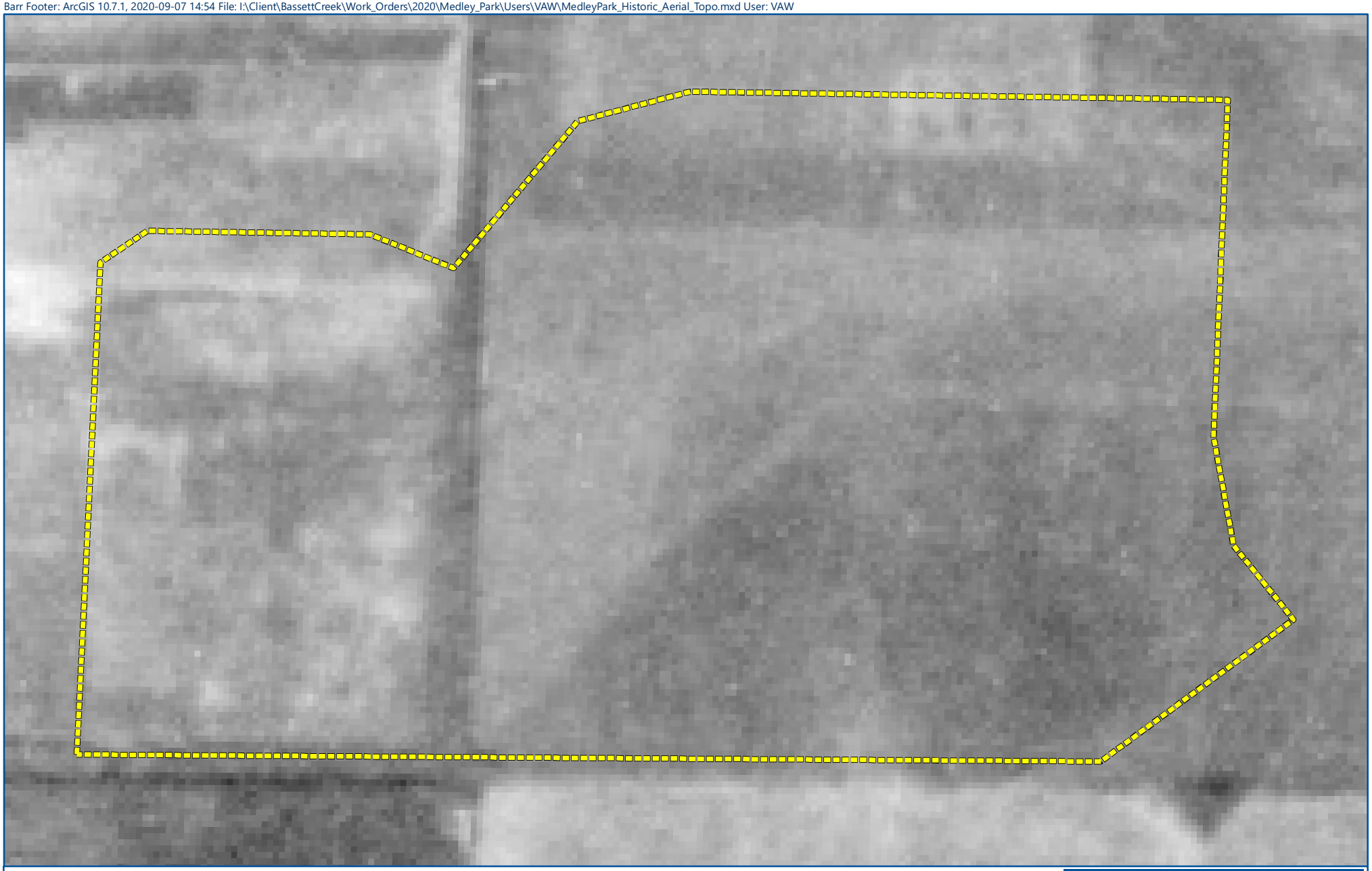
Feet

1 inch = 125 feet

SOILS MAP
Medley Park Stormwater Treatment Facility
Golden Valley, MN

FIGURE 5

Barr Footer: ArcGIS 10.7.1, 2020-09-07 14:54 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Users\VAW\MedleyPark_Historic_Aerial_Topo.mxd User: VAW



BARR

Project Boundary

N

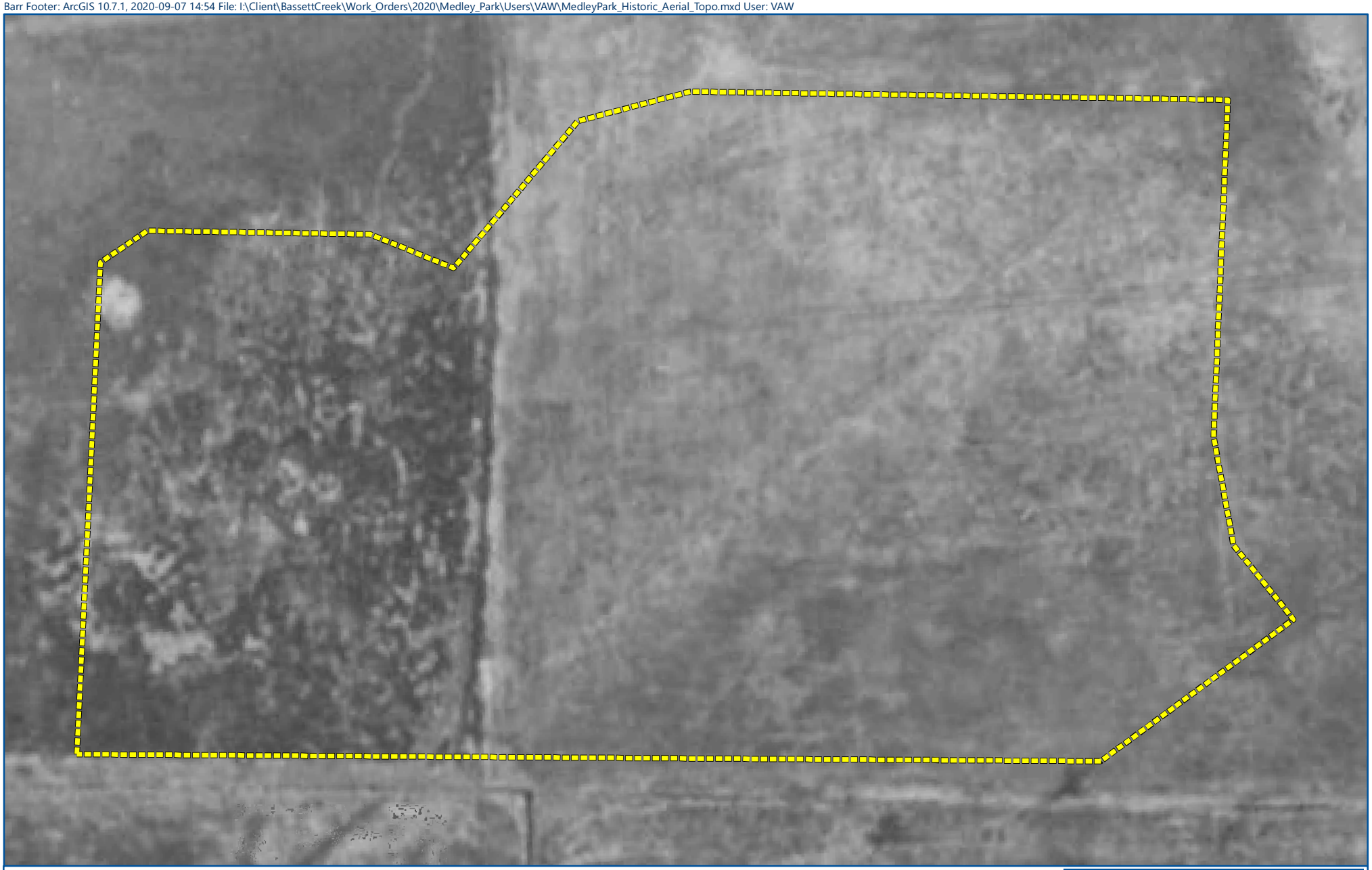
0 120

Feet

MEDLEY PARK
HISTORIC AERIAL
IMAGERY REVIEW
1937

FIGURE 6a

Barr Footer: ArcGIS 10.7.1, 2020-09-07 14:54 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Users\VAW\MedleyPark_Historic_Aerial_Topo.mxd User: VAW



BARR

Project Boundary

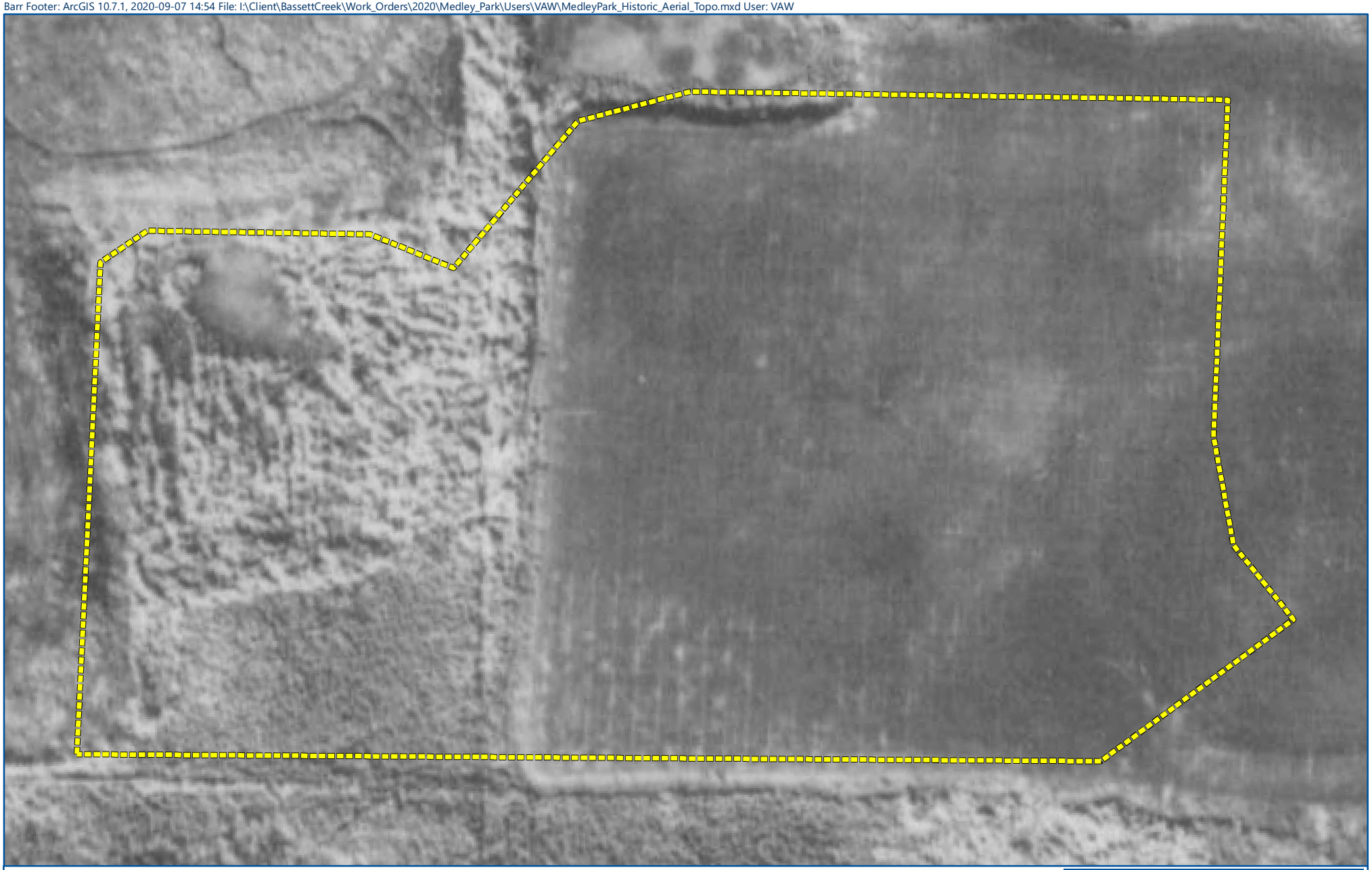
N

0 120

Feet

# MEDLEY PARK HISTORIC AERIAL IMAGERY REVIEW 1957

FIGURE 6b



BARR

Project Boundary

N

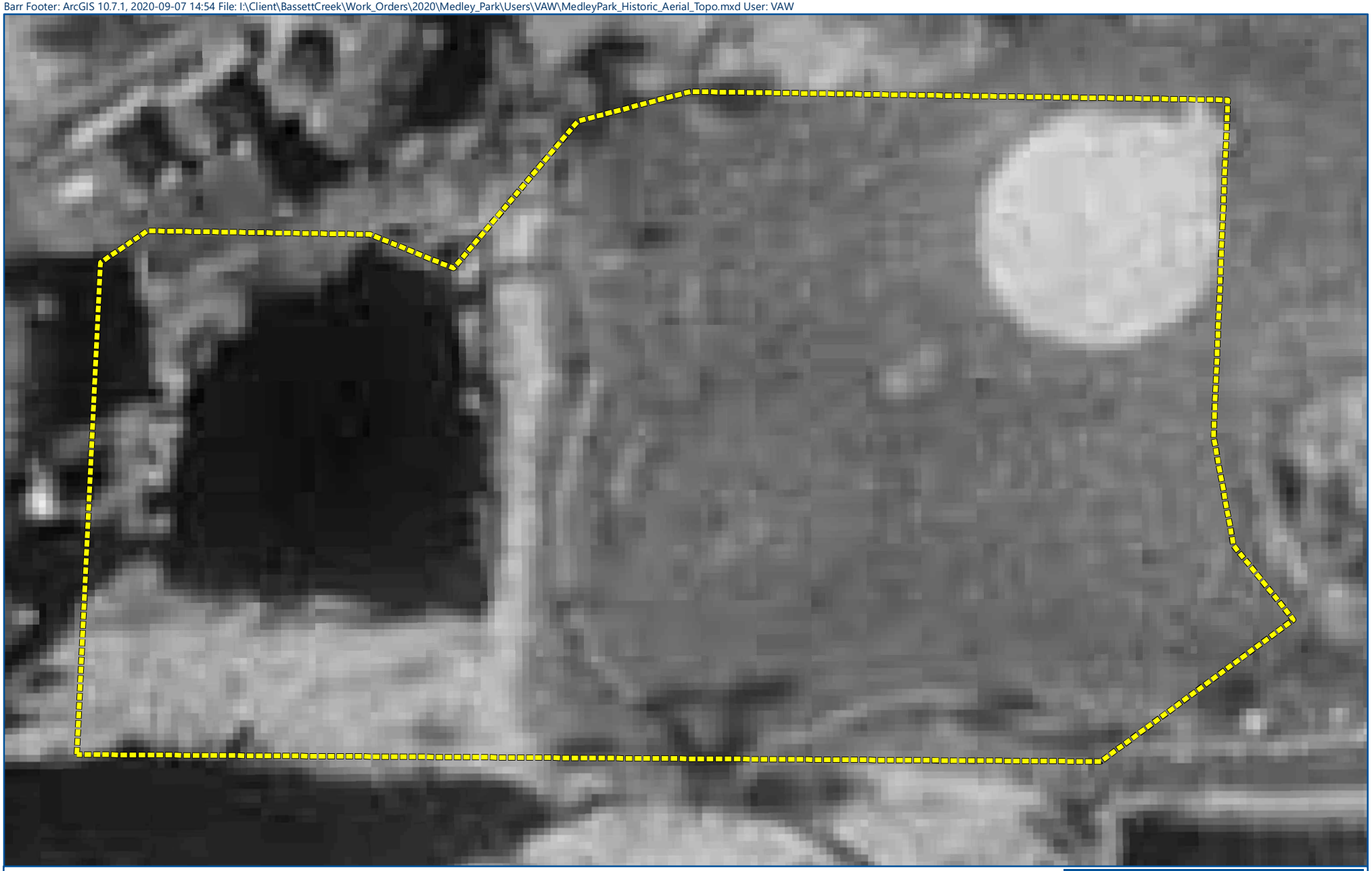
0 120

Feet

MEDLEY PARK
HISTORIC AERIAL
IMAGERY REVIEW
1971

FIGURE 6c

Barr Footer: ArcGIS 10.7.1, 2020-09-07 14:54 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Users\VAW\MedleyPark_Historic_Aerial_Topo.mxd User: VAW



BARR

Project Boundary

N

0 120

Feet

MEDLEY PARK
HISTORIC AERIAL
IMAGERY REVIEW
1991

FIGURE 6d

Barr Footer: ArcGIS 10.7.1, 2020-09-07 14:54 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Users\VAW\MedleyPark_Historic_Aerial_Topo.mxd User: VAW

BARR

Project Boundary

N

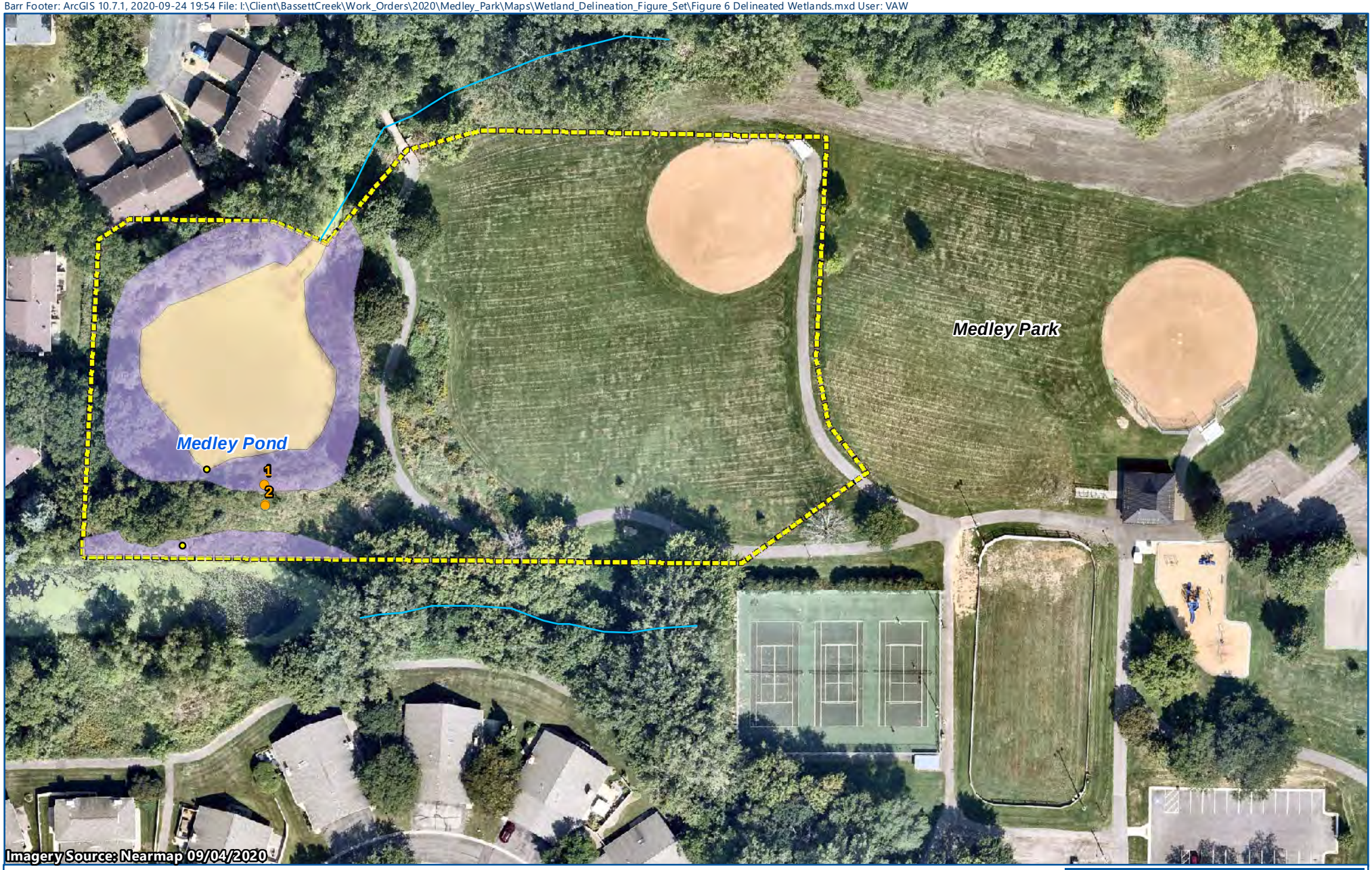
0 120

Feet

MEDLEY PARK
HISTORIC AERIAL
IMAGERY REVIEW
2017

FIGURE 6d

Barr Footer: ArcGIS 10.7.1, 2020-09-24 19:54 File: I:\Client\BassettCreek\Work_Orders\2020\Medley_Park\Maps\Wetland_Delineation_Figure_Set\Figure 6 Delineated Wetlands.mxd User: VAW




Project Boundary
Sample Point
Classifica
Culverts
Drainage Channels
PEMC
PUBGx

N

0 120 240
Feet

1 inch = 96 feet

DELINEATED WETLANDS
Medley Park Stormwater Treatment Facility
Golden Valley, MN

FIGURE 7

# Appendix A
# Wetland Delineation Datasheets

# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Medley Park | Applicant/Owner: City of Golden Valley | City/County: Golden Valley | State: MN | Sampling Date: 09/14/20

Investigator(s): TAC | Section: 30 | Township: 118 | Range: 21 | Sampling Point: SP 1

Land Form: Depression | Local Relief: Concave | Slope %: 2 | Soil Map Unit Name: urban land-Udorthents, wet substratum

Subregion (LRR): M | Latitude: 45.004886 | Longitude: -93.397445 | Datum: Hennepin County

Cowardin Classification: PUBGx/PEMC | Circular 39 Classification: Type 3/4 | Mapped NWI Classification: PUBHx

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Deep Marsh

Are vegetation No Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary): Shallow Marsh

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? Yes
Hydric soil present? Yes
Indicators of wetland hydrology present? Yes
Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed): Sample point is located within the boundary of wetland 1. According to antecedent precipitation data the area has received normal levels of precipitation in the three months prior to the field survey.

**If yes, optional Wetland Site ID:** Wetland 1

## VEGETATION

**Tree Stratum** (Plot Size: 30 ft)

| | | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| 3. | | 0 | | |
| 4. | | 0 | | |
| | Total Cover: | 0 | | |

**Sapling/Shrub Stratum** (Plot Size: 15 ft)

| | | | | |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| 3. | | 0 | | |
| 4. | | 0 | | |
| 5. | | 0 | | |
| | Total Cover: | 0 | | |

**Herb Stratum** (Plot Size: 5 ft)

| | | | | |
|---|---|---|---|---|
| 1. | Typha angustifolia | 35 | Yes | OBL |
| 2. | Cirsium arvense | 30 | Yes | FACU |
| 3. | Impatiens capensis | 10 | No | FACW |
| 4. | Rumex crispus | 5 | No | FAC |
| 5. | | 0 | | |
| 6. | | 0 | | |
| 7. | | 0 | | |
| 8. | | 0 | | |
| | Total Cover: | 80 | | |

**Woody Vine Stratum** (Plot Size: 30 ft)

| | | | | |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| | Total Cover: | 0 | | |

% Bare Ground in Herb Stratum: | % Sphagnum Moss Cover:

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

**50/20 Thresholds:**

| | 20% | 50% |
|---|---|---|
| Tree Stratum | 0 | 0 |
| Sapling/Shrub Stratum | 0 | 0 |
| Herb Stratum | 16 | 40 |
| Woody Vine Stratum | 0 | 0 |

**Dominance Test Worksheet:**

Number of Dominant Species That Are OBL, FACW or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 50.00% (A/B)

**Prevalence Index Worksheet:**

| Total % Cover of: | | Multiply by: | | |
|---|---|---|---|---|
| OBL Species | 35 | X 1 = | 35 | |
| FACW Species | 10 | X 2 = | 20 | |
| FAC Species | 5 | X 3 = | 15 | |
| FACU Species | 30 | X 4 = | 120 | |
| UPL Species | 0 | X 5 = | 0 | |
| Column Totals: | 80 | (A) | 190 | (B) |

Prevalence Index = B/A = 2.38

**Hydrophytic Vegetation Indicators:**

- No — Rapid Test for Hydrophytic Vegetation
- No — Dominance Test is >50%
- Yes — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

10/5/2020 2:59:42 PM

# WETLAND DETERMINATION DATA FORM - Midwest Region

## SOIL

Sampling Point: SP 1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).**

| | Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type [1] | Redox Features Loc [2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 0 - 4 | 10YR 3/2 | 100 | | | | | SiL | |
| 2. | 4 - 8 | 2.5Y 5/2 | 60 | 7.5YR 4/6 | 10 | C | M | SiCL | |
| 3. | - | 10YR 3/2 | 30 | | | | | | |
| 4. | 8 - 24 | Gley 1 10Y 4/1 | 95 | | | | | SiCL | |
| 5. | - | Gley 110Y 5/1 | 5 | | | | | | |
| 6. | - | | | | | | | | |

**[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.**

**Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☑ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils [3]:**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

**[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**

**Restrictive Layer (if present):** **Type:** _____ **Depth (inches):** _____ **Hydric soil present?** Yes

**Soil Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

**Primary Indicators (minimum of one required; check all that apply)**

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (explain in remarks)

**Secondary Indicators (minimum of two required)**

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

**Surface water present?** ☐ **Surface Water Depth (inches):** _____

**Water table present?** ☐ **Water Table Depth (inches):** _____

**Saturation present? (includes capillary fringe)** ☑ **Saturation Depth (inches):** 4

**Indicators of wetland hydrology present?** Yes

**Describe Recorded Data:**

**Recorded Data:** ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

**Hydrology Remarks:**

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# WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Medley Park | Applicant/Owner: City of Golden Valley | City/County: Golden Valley | State: MN | Sampling Date: 09/14/20

Investigator(s): TAC | Section: 30 | Township: 118 | Range: 21 | Sampling Point: SP 2

Land Form: Hillslope | Local Relief: Convex | Slope %: 7 | Soil Map Unit Name: urban land-Udorthents, wet substratum

Subregion (LRR): M | Latitude: 45.004844 | Longitude: -93.397442 | Datum: Hennepin County Coordinates

Cowardin Classification: Upland | Circular 39 Classification: Upland | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Upland

Are vegetation No Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? No
Hydric soil present? No
Indicators of wetland hydrology present? No
Is the sampled area within a wetland? No

General Remarks (explain any answers if needed): Sample point is located on a berm adjacent to wetland 1. According to antecedent precipitation data the area has received normal levels of precipitation in the three months prior to the field survey.

If yes, optional Wetland Site ID:

## VEGETATION

**Tree Stratum** (Plot Size: 30 ft)

| | | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| 3. | | 0 | | |
| 4. | | 0 | | |
| | Total Cover: | 0 | | |

**Sapling/Shrub Stratum** (Plot Size: 15 ft)

| | | | | |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| 3. | | 0 | | |
| 4. | | 0 | | |
| 5. | | 0 | | |
| | Total Cover: | 0 | | |

**Herb Stratum** (Plot Size: 5 ft)

| | | | | |
|---|---|---|---|---|
| 1. | Cirsium arvense | 45 | Yes | FACU |
| 2. | Phalaris arundinacea | 15 | Yes | FACW |
| 3. | Hordeum jubatum | 10 | No | FAC |
| 4. | | 0 | | |
| 5. | | 0 | | |
| 6. | | 0 | | |
| 7. | | 0 | | |
| 8. | | 0 | | |
| | Total Cover: | 70 | | |

**Woody Vine Stratum** (Plot Size: 30 ft)

| | | | | |
|---|---|---|---|---|
| 1. | | 0 | | |
| 2. | | 0 | | |
| | Total Cover: | 0 | | |

% Bare Ground in Herb Stratum: 30 | % Sphagnum Moss Cover:

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

Vegetation at the sample point was stunted and appeared to be mowed.

**50/20 Thresholds:**

| | 20% | 50% |
|---|---|---|
| Tree Stratum | 0 | 0 |
| Sapling/Shrub Stratum | 0 | 0 |
| Herb Stratum | 14 | 35 |
| Woody Vine Stratum | 0 | 0 |

**Dominance Test Worksheet:**

Number of Dominant Species That Are OBL, FACW or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 50.00% (A/B)

**Prevalence Index Worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL Species | 0 | X 1 = | 0 |
| FACW Species | 15 | X 2 = | 30 |
| FAC Species | 10 | X 3 = | 30 |
| FACU Species | 45 | X 4 = | 180 |
| UPL Species | 0 | X 5 = | 0 |
| Column Totals: | 70 (A) | | 240 (B) |

Prevalence Index = B/A = 3.43

**Hydrophytic Vegetation Indicators:**

- No — Rapid Test for Hydrophytic Vegetation
- No — Dominance Test is >50%
- No — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? No

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# WETLAND DETERMINATION DATA FORM - Midwest Region

## SOIL

Sampling Point: SP 2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).**

| | Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type [1] | Redox Features Loc [2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 0 - 30 | 10YR 3/1 | 100 | | | | | SCL | |
| 2. | 30 - 36 | 10YR 3/1 | 80 | | | | | SCL | |
| 3. | - | 7.5YR 4/6 | 20 | | | | | | |
| 4. | - | | | | | | | | |
| 5. | - | | | | | | | | |
| 6. | - | | | | | | | | |

**[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.**

**Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)**

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils [3]:**

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

**[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**

**Restrictive Layer (if present):** **Type:** _____ **Depth (inches):** _____ **Hydric soil present?** No

**Soil Remarks:**

## HYDROLOGY

**Wetland Hydrology Indicators:**

**Primary Indicators (minimum of one required; check all that apply)**

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (explain in remarks)

**Secondary Indicators (minimum of two required)**

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

**Field Observations:**

**Surface water present?** ☐ **Surface Water Depth (inches):** _____

**Water table present?** ☐ **Water Table Depth (inches):** _____

**Saturation present? (includes capillary fringe)** ☐ **Saturation Depth (inches):** _____

**Indicators of wetland hydrology present?** No

**Describe Recorded Data:**

**Recorded Data:** ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

**Hydrology Remarks:** No hydrology indicators were observed. Sample point is located on top of a berm inbetween two wetlands.

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# Appendix B
# Site Photographs

Medley Park

Photolog

Photograph 1,eastern edge of the project area, view north

Photograph 2, southeastern edge of project area, view west

Photograph 3,center of baseball field, view north

Photograph 4, native prairie planting on the southwest end of the project area, view west

Photograph 5,overview of native prairie planting, view south

Photograph 6, wetland 1, view north

Photograph 7,northern end of wetland 1, view south

Photograph 8, Southern segment of wetland 1, view southeast

# Appendix C
# MnRAM Wetland Management Classification

# MnRAM 3.2 Digital Worksheet, Side 2

| | | Question Description | User entry | Rating | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | Veg. Table 2, Option 4 | | 0.22 | | | | | | | | | | |
| | | **TOTAL VEG Rating** | 0.22 | L | | | | | | | | | | |
| | 4 | Listed, rare, special plant species? | n | next | | | | | | | | | | |
| | 5 | Rare community or habitat? | n | next | | | | | | | | | | |
| | 6 | Pre-European-settlement conditions? | n | next | | | | | | | | | | |
| | 7 | hydrogeo & topo onal/Flow | #N/A | | | | | | | | | | | |
| | 8 | Water depth (inches) | 60 | | | | | | | | | | | |
| | | Water depth (% inundation) | | | | | | | | | | | | |
| | 9 | Local watershed/immedita drainage (acres) | | | | | | | | | | | | |
| | 10 | Existing wetland size | 0.82 | | | | | | | | | | | |
| | 11 | SOILS: Up/Wetland (survey classification + site) | | | | | | | | | | | | |
| Digital worksheet, section I | 12 | Outlet characteristics for flood retention | A | 1 | | | | | | | | | | |
| | 13 | Outlet characteristics for hydrologic regime | C | 0.1 | | | | | | | | | | |
| | 14 | Dominant upland land use (within 500 ft) | B | 0.5 | 0.5 | | | | | | | | | |
| | 15 | Soil condition (wetland) | B | 0.5 | | | | | | | | | | |
| | 16 | Vegetation (% cover) | 30% | M | 0.5 | | | | | | | | | |
| | 17 | Emerg. veg. flood resistance | B | 0.5 | | | | | | | | | | |
| | 18 | Sediment delivery | C | 0.1 | | | | | | | | | | |
| | 19 | Upland soils (based on soil group) | B | 0.5 | | | | | | | | | | |
| | 20 | Stormwater runoff pretreatment & detention | A | 1 | 0.1 | | | | | | | | | |
| | 21 | Subwatershed wetland density | B | 0.5 | | | | | | | | | | |
| | 22 | Channels/sheet flow | A | 1 | | | | | | | | | | |
| | 23 | Adjacent naturalized buffer average width (feet) | 30 | M | WQ | 0.5 | L | | 0.1 | | | | | |
| | 24 | Adjacent Area Management: % Full | 60% | 0.6 | 2 | **0.8** | | | | | | | | |
| | | adjacent area mgmt: % Manicured | 40% | 0.2 | | | | | | | | | | |
| | | adjacent area mgmt: % Bare | 0% | 0 | | | | | | | | | | |
| | 25 | Adjacent Area Diversity & Structure: % Native | 10% | 0.1 | 3 | **0.51** | | | | | | | | |
| | | adjacent area diversity: % Mixed | 80% | 0.4 | | | | | | | | | | |
| | | adjacent area diversity: % Sparse/Inv./Exotic | 10% | 0.01 | | | | | | | | | | |
| | 26 | Adjacent Area Slope: % Gentle | 25% | 0.25 | 3 | **0.525** | | | | | | | | |
| | | adjacent area slope: % Moderate | 50% | 0.25 | | | | | | | | | | |
| | | adjacent area slope: % Steep | 25% | 0.025 | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Digital worksheet, section II | 27 | Downstream sensitivity/WQ protection | B | 0.5 | | | | | | | | | | |
| | 28 | Nutrient loading | C | 0.1 | | | | | | | | | | |
| | 29 | Shoreline wetland? | N | N | | | | | | | | | | |
| | 30 | Rooted shoreline vegetation (%cover ) | Enter a percentage | | | | | | | | | | | |
| | 31 | Wetland in-water width (in feet, average) | Enter a percentage | | | | | | | | | | | |
| | 32 | Emergent vegetation erosion resistance | Enter valid choice | | | | | | | | | | | |
| | 33 | Shoreline erosion potential | Enter valid cho | | | | | | | | | | | |
| | 34 | Bank protection/upslope veg. | Enter valid choice | | | | | | | | | | | |
| | 35 | Rare Wildlife | N | N | | | | | | | | | | |
| | 36 | Scarce/Rare/S1/S2 local community | N | N | | | | | | | | | | |
| | 37 | Vegetation interspersion cover (see diagram 1) | 4 | M | 0.5 | | | | | | | | | |
| | 38 | Community interspersion (see diagram 2) | 1 | L | 0.1 | | | | | 0 | | | | |
| | 39 | Wetland detritus | B | 0.5 | | | | | | | | | | |
| | 40 | Wetland interspersion on landscape | B | 0.5 | 0.5 | | | | | | | | | |
| | 41 | Wildlife barriers | C | 0.1 | | | | | | | | | | |
| | 42 | Amphibian breeding potential-hydroperiod | A | 1 | | | | | | | | | | |
| | 43 | Amphibian breeding potential--fish presence | A | 1 | | | | | | | | | | |
| | 44 | Amphibian & reptile overwintering habitat | A | 1 | | | | | | | | | | |
| | 45 | Wildlife species (list) | Redwing black bird | | | | | | | | | | | |
| | 46 | Fish habitat quality | C | 0.1 | | | | | | | | | | |
| | 47 | Fish species (list) | N/A | | | | | | | | | | | |
| | 48 | Unique/rare educ./cultural/rec.opportunity | N | N | | | | | | | | | | |
| | 49 | Wetland visibility | A | 1 | | | | | | | | | | |
| | 50 | Proximity to population | Y | 1 | | | | | | | | | | |
| | 51 | Public ownership | A | 1 | | | | | | | | | | |
| | 52 | Public access | A | 1 | | | | | | | | | | |
| | 53 | Human influence on wetland | C | 0.1 | | | | | | | | | | |
| | 54 | Human influence on viewshed | C | 0.1 | | | | | | | | | | |
| | 55 | Spatial buffer | B | 0.5 | | | | | | | | | | |
| | 56 | Recreational activity potential | C | 0.1 | | | | | | | | | | |
| | 57 | Commercial crop--hydrologic impact | N/A | N/A | | | | | | | | | | |

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated: 0.3

**Enter data starting here. Yellow boxes are used in calculations.**

Scroll down to answer more questions and see formula calculations

**Additional questions**

| | | | | |
|---|---|---|---|---|
| 58 | ***GW - Wetland soils*** | R | R or D | 0.1 |
| 59 | ***GW - Subwatershed land use*** | R | R or D | 0.1 |
| 60 | ***GW - Wetland size and soil group*** | R | R or D | 0.1 |
| 61 | GW - Wetland hydroperiod | D | R or D | 1 |
| 62 | GW - Inlet/Outlet configuration | D | R or D | 1 |
| 63 | GW - Surrounding upland topographic relief | D | R or D | 1 |
| 64 | Restoration potential w/o flooding | | Y or N | 3.3 |
| 65 | ***Landowners affected by restoration*** | | ***E a b c*** | Enter valid choice |
| 66A | ***Existing wetland size (acres) [from #10]*** | 0.82 | __ acres | |
| 66B | Total wetland restoration size (acres) | | __ acres | 0.1 |
| 66C | (Calculated) Potential New Wetland Area [B-A] | -0.82 | __ acres | % effectively drained: #### |
| 67 | Average width of naturalized upland buffer (poten | 0 | __ feet | 0.1 value: #### |
| 68 | Likelihood of restoration success | | a b c | Enter valid choice |
| 69 | Hydrologic alteration type | | Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling | |
| 70 | Potential wetland type (Circ. 39) | | 1, 2, 3, 4, 5, 6, 7, 8 | |
| 71 | Wetland sensitivity to stormwater | | E a b c | |
| 72 | Additional stormwater treatment needs | | a b c | |

**Functional Rating Summaries**

| Function Name | Raw score | Final Rating | Rating Category | Formula shown to the right. |
|---|---|---|---|---|
| Vegetative Diversity/Integrity | | 0.22 | L | |
| Hydrology - Characteristic | | 0.30 | Low | |
| Flood Attenuation | | 0.64 | Med | |
| Water Quality--Downstream | | 0.60 | Med | |
| Water Quality--Wetland | | 0.26 | Low | |
| Shoreline Protection | | N/A | N/A | |
| Characteristic Wildlife Habitat Structure | 0.28 | 0.28 | Low | |
| Maintenance of Characteristic Fish Habitat | 0.22 | 0.22 | Low | |
| Maintenance of Characteristic Amphibian Habitat | | 0.32 | Low | |
| Aesthetics/Recreation/Education/Cultural | 0.49 | 0.49 | Med | |
| | | | | |
| Commercial use | | N/A | N/A | 0 |
| | | | | |

Special Features listing: -

| | | |
|---|---|---|
| Groundwater Interaction | indeterminate GW source | |
| Groundwater Functional Index | | no special indicators |
| Restoration Potential (draft formula) | #VALUE! | ##### |
| Stormwater Sensitivity (not active) | | |

# Appendix D

## Feasibility Level Cost Estimates

| | | | | | |
|---|---|---|---|---|---|
| BARR **PREPARED BY: BARR ENGINEERING COMPANY** | | SHEET: | 1 | OF | 1 |
| | | CREATED BY: | TAO2 | DATE: | 2/18/2021 |
| **ENGINEER'S OPINION OF PROBABLE PROJECT COST** | | CHECKED BY: | KJN2 | DATE: | 2/22/2021 |
| PROJECT: Medley Park - Concept 1 | | APPROVED BY: | | DATE: | |
| LOCATION: City of Golden Valley | ISSUED: | | | DATE: | |
| PROJECT #: 23270051.51 | ISSUED: | | | DATE: | |
| **OPINION OF COST - SUMMARY** | ISSUED: | | | DATE: | |

# Engineer's Opinion of Probable Project Cost

## Medley Park - Concept #1

## Stormwater Retrofit (Feasibility Design)

| Cat. No. | ITEM DESCRIPTION | UNIT | ESTIMATED QUANTITY | UNIT COST | ITEM COST | NOTES |
|---|---|---|---|---|---|---|
| A | Mobilization/Demobilization | LS | 1 | $107,500 | $107,500 | 1,2,3,4,5,6 |
| B | Traffic and Pedestrian Safety Control Measures | LS | 1 | $5,000 | $5,000 | 1,2,3,4,5,6 |
| C | Construction Layout and Staking | LS | 1 | $20,000 | $20,000 | 1,2,3,4,5,6 |
| D | Temporary Erosion Control | LS | 1 | $5,500 | $5,500 | 1,2,3,4,5,6 |
| E | Coordinate Utility Relocation | LS | 1 | $4,000 | $4,000 | 1,2,3,4,5,6 |
| F | Removal and Disposal of Tree < 7" Diameter | EA | 2 | $390 | $780 | 1,2,3,4,5,6 |
| G | Removal and Disposal of Tree 12 inch to 28 inch Diameter | EA | 5 | $1,200 | $6,000 | 1,2,3,4,5,6 |
| H | Remove and Dispose Bituminous Pavement | SY | 508 | $5 | $2,539 | 1,2,3,4,5,6 |
| I | Sawcut Bituminous Pavement (Full Depth) | LF | 24 | $6 | $144 | 1,2,3,4,5,6 |
| J | Remove and Dispose Sewer Pipe (36" RCP) | LF | 16 | $30 | $480 | 1,2,3,4,5,6 |
| K | Remove Existing Structure | Each | 1 | $600 | $600 | 1,2,3,4,5,6 |
| L | Salvage and Place Topsoil (P) | CY | 586 | $10 | $5,863 | 1,2,3,4,5,6 |
| M | Excavation (P) | CY | 12,033 | $9 | $108,297 | 1,2,3,4,5,6 |
| N | Subgrade Excavation | CY | 1,971 | $11 | $21,686 | 1,2,3,4,5,6 |
| O | Contaminated Sediment Excavation | CY | 1,499 | $20 | $29,980 | 1,2,3,4,5,6 |
| P | Offsite Disposal of Excavated Soil (Clean) | CY | 13,812 | $20 | $276,249 | 1,2,3,4,5,6 |
| Q | Offsite Disposal of Excavated Soil (Contaminated) | TON | 1,949 | $30 | $58,461 | 1,2,3,4,5,6 |
| R | Aggregate Base (CV), Class 5 | CY | 228 | $45 | $10,250 | 1,2,3,4,5,6 |
| S | Common Borrow Import | CY | 1 | $16 | $16 | 1,2,3,4,5,6 |
| T | Topsoil Import | TON | 722 | $40 | $28,885 | 1,2,3,4,5,6 |
| U | Bituminous Pavement (Typ) | SY | 1,367 | $30 | $41,000 | 1,2,3,4,5,6 |
| V | 12" RCP Pipe Sewer | LF | 25 | $90 | $2,250 | 1,2,3,4,5,6 |
| W | 12" RCP FES | Each | 1 | $680 | $680 | 1,2,3,4,5,6,7 |
| X | 24" RCP Pipe Sewer | LF | 401 | $130 | $52,130 | 1,2,3,4,5,6 |
| Y | 24" RCP FES | Each | 7 | $1,000 | $7,000 | 1,2,3,4,5,6,7 |
| Z | 24" FES Trash Rack | Each | 2 | $1,800 | $3,600 | 1,2,3,4,5,6 |
| AA | 48" Diameter RC Drainage Structure, Complete | Each | 1 | $5,500 | $5,500 | 1,2,3,4,5,6 |
| BB | 60" Diameter RC Drainage Structure with 5-foot Weir, Complete | Each | 2 | $11,000 | $22,000 | 1,2,3,4,5,6 |
| CC | Random Riprap, Class III with Filter Fabric | TON | 10 | $80 | $800 | 1,2,3,4,5,6 |
| DD | Restoration/Planting | AC | 1.4 | $15,000 | $21,300 | 1,2,3,4,5,6 |
| EE | Clean Washed Sand | CY | 1,053 | $105 | $110,530 | 1,2,3,4,5,6 |
| FF | Small Splash Block Assembly (Pipe Discharge) | EA | 2 | $1,800 | $3,600 | 1,2,3,4,5,6 |
| GG | 6" Perforated Dual Wall HDPE Draintile Pipe and Fittings (no sock) (P) | LF | 632 | $23 | $14,536 | 1,2,3,4,5,6 |
| HH | 6" Draintile Cleanout and Cover Unit | EA | 3 | $650 | $1,950 | 1,2,3,4,5,6 |
| II | Planting Soil (75% sand, 25% leaf compost - MnDOT Grade II) (P) | CY | 526 | $60 | $31,580 | 1,2,3,4,5,6 |
| JJ | Plantings and Mulch | SF | 14,211 | $5 | $71,055 | 1,2,3,4,5,6 |
| KK | Dewatering | LS | 1 | $100,000 | $100,000 | 1,2,3,4,5,6 |
| | CONSTRUCTION SUBTOTAL | | | | $1,182,000 | 1,2,3,4,5,6,7,8 |
| | CONSTRUCTION CONTINGENCY (25%) | | | | $296,000 | 1,4,8 |
| | ESTIMATED CONSTRUCTION COST | | | | $1,478,000 | 1,2,3,4,5,6,7,8 |
| | | | | | | |
| | PLANNING, ENGINEERING, & DESIGN (25%) | | | | $370,000 | 1,2,3,4,5,6,7,8 |
| | EASEMENTS | | | | | 1,5,6 |
| | PERMITTING & REGULATORY APPROVALS | | | | | 1,5,6 |
| | | | | | | |
| | ESTIMATED TOTAL PROJECT COST | | | | **$1,848,000** | 1,2,3,4,5,6,7,8 |
| | **ESTIMATED ACCURACY RANGE** | **-20%** | | | $1,479,000 | 1,2,3,4,5,6,7,8 |
| | | **30%** | | | $2,403,000 | 1,2,3,4,5,6,7,8 |

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.

| | | | | | | |
|---|---|---|---|---|---|---|
| BARR | **PREPARED BY: BARR ENGINEERING COMPANY** | | SHEET: | 1 | OF | 1 |
| | | | CREATED BY: | TAO2 | DATE: | 2/18/2021 |
| **ENGINEER'S OPINION OF PROBABLE PROJECT COST** | | | CHECKED BY: | KJN2 | DATE: | 2/22/2021 |
| PROJECT: | Medley Park - Concept 2 | | APPROVED BY: | | DATE: | |
| LOCATION: | City of Golden Valley | ISSUED: | | | DATE: | |
| PROJECT #: | 23270051.51 | ISSUED: | | | DATE: | |
| **OPINION OF COST - SUMMARY** | | ISSUED: | | | DATE: | |

# Engineer's Opinion of Probable Project Cost

## Medley Park - Concept #2

## Stormwater Retrofit (Feasibility Design)

| Cat. No. | ITEM DESCRIPTION | UNIT | ESTIMATED QUANTITY | UNIT COST | ITEM COST | NOTES |
|---|---|---|---|---|---|---|
| A | Mobilization/Demobilization | LS | 1 | $124,300 | $124,300 | 1,2,3,4,5,6 |
| B | Traffic and Pedestrian Safety Control Measures | LS | 1 | $5,000 | $5,000 | 1,2,3,4,5,6 |
| C | Construction Layout and Staking | LS | 1 | $20,000 | $20,000 | 1,2,3,4,5,6 |
| D | Temporary Erosion Control | LS | 1 | $5,500 | $5,500 | 1,2,3,4,5,6 |
| E | Coordinate Utility Relocation | LS | 1 | $4,000 | $4,000 | 1,2,3,4,5,6 |
| F | Removal and Disposal of Tree < 7" Diameter | EA | 2 | $390 | $780 | 1,2,3,4,5,6 |
| G | Removal and Disposal of Tree 12 inch to 28 inch Diameter | EA | 5 | $1,200 | $6,000 | 1,2,3,4,5,6 |
| H | Remove and Dispose Bituminous Pavement | SY | 249 | $5 | $1,247 | 1,2,3,4,5,6 |
| I | Sawcut Bituminous Pavement (Full Depth) | LF | 24 | $6 | $144 | 1,2,3,4,5,6 |
| J | Remove and Dispose Sewer Pipe (36" RCP) | LF | 16 | $30 | $480 | 1,2,3,4,5,6 |
| K | Salvage and Place Topsoil (P) | CY | 586 | $10 | $5,863 | 1,2,3,4,5,6 |
| L | Excavation (P) | CY | 13,236 | $9 | $119,124 | 1,2,3,4,5,6 |
| M | Subgrade Excavation | CY | 1,810 | $11 | $19,912 | 1,2,3,4,5,6 |
| N | Contaminated Sediment Excavation | CY | 1,499 | $20 | $29,980 | 1,2,3,4,5,6 |
| O | Offsite Disposal of Excavated Soil (Clean) | CY | 14,339 | $20 | $286,783 | 1,2,3,4,5,6 |
| P | Offsite Disposal of Excavated Soil (Contaminated) | TON | 1,949 | $30 | $58,461 | 1,2,3,4,5,6 |
| Q | Aggregate Base (CV), Class 5 | CY | 170 | $45 | $7,667 | 1,2,3,4,5,6 |
| R | Common Borrow Import | CY | 1 | $16 | $16 | 1,2,3,4,5,6 |
| S | Topsoil Import | TON | 473 | $40 | $18,920 | 1,2,3,4,5,6 |
| T | Bituminous Pavement (Typ) | SY | 1,022 | $30 | $30,667 | 1,2,3,4,5,6 |
| U | 24" RCP Pipe Sewer | LF | 250 | $130 | $32,500 | 1,2,3,4,5,6 |
| V | 24" RCP FES | Each | 3 | $1,000 | $3,000 | 1,2,3,4,5,6,7 |
| W | 30" RCP Pipe Sewer | LF | 73 | $150 | $10,950 | 1,2,3,4,5,6 |
| X | 30" RCP FES | Each | 2 | $1,310 | $2,620 | 1,2,3,4,5,6 |
| Y | 30" FES Trash Rack | Each | 1 | $2,300 | $2,300 | 1,2,3,4,5,6 |
| Z | 48" Diameter RC Drainage Structure, Complete | Each | 3 | $5,500 | $16,500 | 1,2,3,4,5,6 |
| AA | 60" Diameter RC Drainage Structure with 5-foot Weir, Complete | Each | 1 | $11,000 | $11,000 | 1,2,3,4,5,6 |
| BB | 14' x 5' Precast Concrete Box Culvert | LF | 74 | $1,040 | $76,960 | 1,2,3,4,5,6 |
| CC | 14' x 5' Precast Concrete Box Culvert End Section | Each | 2 | $14,500 | $29,000 | 1,2,3,4,5,6 |
| DD | Random Riprap, Class III with Filter Fabric | TON | 50 | $80 | $4,000 | 1,2,3,4,5,6 |
| EE | Restoration/Planting | AC | 1.2 | $15,000 | $17,700 | 1,2,3,4,5,6 |
| FF | Clean Washed Sand | CY | 1,266 | $105 | $132,953 | 1,2,3,4,5,6 |
| GG | Small Splash Block Assembly (Pipe Discharge) | EA | 1 | $1,800 | $1,800 | 1,2,3,4,5,6 |
| HH | 6" Perforated Dual Wall HDPE Draintile Pipe and Fittings (no sock) (P) | LF | 1,099 | $23 | $25,277 | 1,2,3,4,5,6 |
| II | 6" Draintile Cleanout and Cover Unit | EA | 6 | $650 | $3,900 | 1,2,3,4,5,6 |
| JJ | Planting Soil (75% sand, 25% leaf compost - MnDOT Grade II) (P) | CY | 633 | $60 | $37,987 | 1,2,3,4,5,6 |
| KK | Metal Hand Rail | LF | 110 | $225 | $24,750 | 1,2,3,4,5,6 |
| LL | Plantings and Mulch | SF | 17,094 | $5 | $85,470 | 1,2,3,4,5,6 |
| MM | Turf Reinforcement Mat | SY | 100 | $30 | $3,000 | 1,2,3,4,5,6 |
| NN | Dewatering | LS | 1 | $100,000 | $100,000 | 1,2,3,4,5,6 |
| | CONSTRUCTION SUBTOTAL | | | | $1,367,000 | 1,2,3,4,5,6,7,8 |
| | CONSTRUCTION CONTINGENCY (25%) | | | | $342,000 | 1,4,8 |
| | ESTIMATED CONSTRUCTION COST | | | | $1,709,000 | 1,2,3,4,5,6,7,8 |
| | | | | | | |
| | PLANNING, ENGINEERING, & DESIGN (25%) | | | | $428,000 | 1,2,3,4,5,6,7,8 |
| | EASEMENTS | | | | | 1,5,6 |
| | PERMITTING & REGULATORY APPROVALS | | | | | 1,5,6 |
| | | | | | | |
| | ESTIMATED TOTAL PROJECT COST | | | | **$2,137,000** | 1,2,3,4,5,6,7,8 |
| | **ESTIMATED ACCURACY RANGE** | **-20%** | | | $1,710,000 | 1,2,3,4,5,6,7,8 |
| | | **30%** | | | $2,779,000 | 1,2,3,4,5,6,7,8 |

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.

| | | | | | |
|---|---|---|---|---|---|
| BARR | **PREPARED BY: BARR ENGINEERING COMPANY** | | SHEET: | 1 | OF 1 |
| | | | CREATED BY: | TAO2 | DATE: 2/18/2021 |
| **ENGINEER'S OPINION OF PROBABLE PROJECT COST** | | | CHECKED BY: | KJN2 | DATE: 2/22/2021 |
| PROJECT: Medley Park - Concept 3 | | | APPROVED BY: | | DATE: |
| LOCATION: City of Golden Valley | | ISSUED: | | | DATE: |
| PROJECT #: 23270051.51 | | ISSUED: | | | DATE: |
| **OPINION OF COST - SUMMARY** | | ISSUED: | | | DATE: |

# Engineer's Opinion of Probable Project Cost

## Medley Park - Concept #3

## Stormwater Retrofit (Feasibility Design)

| Cat. No. | ITEM DESCRIPTION | UNIT | ESTIMATED QUANTITY | UNIT COST | ITEM COST | NOTES |
|---|---|---|---|---|---|---|
| A | Mobilization/Demobilization | LS | 1 | $107,400 | $107,400 | 1,2,3,4,5,6 |
| B | Traffic and Pedestrian Safety Control Measures | LS | 1 | $5,000 | $5,000 | 1,2,3,4,5,6 |
| C | Construction Layout and Staking | LS | 1 | $20,000 | $20,000 | 1,2,3,4,5,6 |
| D | Temporary Erosion Control | LS | 1 | $5,500 | $5,500 | 1,2,3,4,5,6 |
| E | Coordinate Utility Relocation | LS | 1 | $4,000 | $4,000 | 1,2,3,4,5,6 |
| F | Removal and Disposal of Tree < 7" Diameter | EA | 2 | $390 | $780 | 1,2,3,4,5,6 |
| G | Removal and Disposal of Tree 12 inch to 28 inch Diameter | EA | 5 | $1,200 | $6,000 | 1,2,3,4,5,6 |
| H | Remove and Dispose Bituminous Pavement | SY | 508 | $5 | $2,539 | 1,2,3,4,5,6 |
| I | Sawcut Bituminous Pavement (Full Depth) | LF | 24 | $6 | $144 | 1,2,3,4,5,6 |
| J | Salvage and Place Topsoil (P) | CY | 586 | $10 | $5,863 | 1,2,3,4,5,6 |
| K | Excavation (P) | CY | 18,875 | $9 | $169,875 | 1,2,3,4,5,6 |
| L | Subgrade Excavation | CY | 1,245 | $11 | $13,695 | 1,2,3,4,5,6 |
| M | Contaminated Sediment Excavation | CY | 1,499 | $20 | $29,980 | 1,2,3,4,5,6 |
| N | Offsite Disposal of Excavated Soil (Clean) | CY | 19,373 | $20 | $387,460 | 1,2,3,4,5,6 |
| O | Offsite Disposal of Excavated Soil (Contaminated) | TON | 1,949 | $30 | $58,461 | 1,2,3,4,5,6 |
| P | Aggregate Base (CV), Class 5 | CY | 519 | $45 | $23,333 | 1,2,3,4,5,6 |
| Q | Common Borrow Import | CY | 1 | $16 | $16 | 1,2,3,4,5,6 |
| R | Topsoil Import | TON | 407 | $40 | $16,296 | 1,2,3,4,5,6 |
| S | Bituminous Pavement (Typ) | SY | 1,556 | $30 | $46,667 | 1,2,3,4,5,6 |
| T | 24" RCP Pipe Sewer | LF | 119 | $130 | $15,470 | 1,2,3,4,5,6 |
| U | 24" RCP FES | Each | 4 | $1,000 | $4,000 | 1,2,3,4,5,6,7 |
| V | 24" FES Trash Rack | Each | 2 | $1,800 | $3,600 | 1,2,3,4,5,6 |
| W | 14' x 5' Precast Concrete Box Culvert | LF | 74 | $1,040 | $76,960 | 1,2,3,4,5,6 |
| X | 14' x 5' Precast Concrete Box Culvert End Section | Each | 2 | $14,500 | $29,000 | 1,2,3,4,5,6 |
| Y | Random Riprap, Class III with Filter Fabric | TON | 50 | $80 | $4,000 | 1,2,3,4,5,6 |
| Z | Restoration/Planting | AC | 1.1 | $15,000 | $16,800 | 1,2,3,4,5,6 |
| AA | Metal Hand Rail | LF | 110 | $225 | $24,750 | 1,2,3,4,5,6 |
| BB | Turf Reinforcement Mat | SY | 100 | $30 | $3,000 | 1,2,3,4,5,6 |
| CC | Dewatering | LS | 1 | $100,000 | $100,000 | 1,2,3,4,5,6 |
| | CONSTRUCTION SUBTOTAL | | | | $1,181,000 | 1,2,3,4,5,6,7,8 |
| | CONSTRUCTION CONTINGENCY (25%) | | | | $295,000 | 1,4,8 |
| | ESTIMATED CONSTRUCTION COST | | | | $1,476,000 | 1,2,3,4,5,6,7,8 |
| | | | | | | |
| | PLANNING, ENGINEERING, & DESIGN (25%) | | | | $369,000 | 1,2,3,4,5,6,7,8 |
| | EASEMENTS | | | | | 1,5,6 |
| | PERMITTING & REGULATORY APPROVALS | | | | | 1,5,6 |
| | | | | | | |
| | ESTIMATED TOTAL PROJECT COST | | | | **$1,845,000** | 1,2,3,4,5,6,7,8 |
| **ESTIMATED ACCURACY RANGE** | | **-20%** | | | $1,476,000 | 1,2,3,4,5,6,7,8 |
| | | **30%** | | | $2,399,000 | 1,2,3,4,5,6,7,8 |

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.