Preliminary Engineering Report

Silver Lake Infrastructure Improvements

Silver Lake, Minnesota

SILAK 152875 | November 12, 2020 (Revised August 11, 2022)

SEH

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SEH No. SILAK 152875

November 12, 2020 (Revised August 11, 2022)

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

John Rodeberg, PE

Date: November 12, 2020 License No.: 18596

Reviewed By: Jordan Van Oort, PE Date: November 12, 2020

Short Elliott Hendrickson Inc.
1390 Highway 15 South, Suite 200
P.O. Box 308
Hutchinson, MN 55350-0308
320.587.7341

Executive Summary

The existing water tower is over 100 years old and is near the end of its useful life. The City does not have a water treatment facility. The only source of treatment for the drinking water is chlorine and fluoride addition at Well No. 2. The raw water quality from the City's two (2) wells contain high levels of iron, manganese, and ammonia, which result in the City getting frequent complaints about the taste, odor, and texture of the drinking water.

The existing sanitary collection system within the project area has extremely high inflow and infiltration (I/I). The high I/I creates a health and sanitation problem as the treatment ponds have been operating above design flow for several years. I/I must be reduced to meet MPCA standards.

A combination of sanitary replacement and lining of the main lines and service lines is recommended to reduce the I/I. Water distribution lines and storm sewer should be replaced as well since they are beyond their useful life and will be disrupted during construction. Lift stations with unreliable equipment will be upgraded or replaced. The stabilization pond requires improvements and maintenance to continue operations.

Replacing the existing water tower with a standpipe storage unit and pump station is recommended. It is also recommended to construct a water treatment (filtration) plant to improve water quality.

Preferred Alternatives & Cost

The table below shows the total project costs for the preferred alternatives.

Item	Well Rehab	Water Storage Tank & Pump Station	Pressure Filter WTP	Streets, Distribution, Collection and Storm	Wastewater	Totals
Construction Cost	$375,000	$1,053,700	$1,755,100	$17,937,584	$1,344,498	$22,465,882
Construction Contingency	$93,750	$105,370	$175,510	$1,793,758	$134,450	$2,302,838
Estimated Total Construction Cost	**$468,750**	**$1,159,070**	**$1,930,610**	**$19,731,342**	**$1,478,948**	**$24,768,720**
Land Acquisition	$0	$0	$0	$10,000	$25,000	$35,000
Engineering	$67,500	$189,666	$351,020	$3,587,517	$295,790	$4,491,493
Legal and Admin	$9,400	$26,343	$43,878	$448,440	$33,612	$561,672
Testing	$3,000	$8,430	$14,041	$143,501	$10,756	$179,727
Non-Construction Cost Subtotal	**$79,900**	**$224,438**	**$408,938**	**$4,189,457**	**$365,158**	**$5,267,892**
Interim Interest	$14,160	$35,695	$60,360	$617,157	$47,578	$774,949
Estimated Total Capital Cost	**$562,810**	**$1,419,203**	**$2,399,909**	**$24,537,956**	**$1,891,684**	**$30,811,561**

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Preliminary Engineering Report

Silver Lake Infrastructure Improvements

Prepared for City of Silver Lake, Minnesota

1 Project Planning

1.1 Location

The City of Silver Lake is located in Sections 33 and 34 of Hale Township and is situated at the north side of Silver Lake in McLeod County. The proposed project location is bounded on the west by Lane Avenue, on the south by Silver Lake, on the north by TH 7, and on the east by East Avenue and the city limits. See Figure 1 for the location of the project and the City of Silver Lake.

1.2 Environmental Resources Present

An extensive investigation of the environmental resources present within the project area, the possible impacts to these resources, and any actions necessary to mitigate these impacts was undertaken as part of drafting the Environmental Review Report (ER–the companion report to the Preliminary Engineering Report (PER)). The range of Environmental resources examined included:

- Land Use/Important Farmland/Formally Classified Lands
- Floodplains
- Wetlands
- Public Waters
- Historic Properties/Archaeological Resources (local Historical Society, SHPO, Tribal Concerns)
- Biological Resources
- Water Quality Issues
- Socio-Economic/Environmental Justice Issues
- Miscellaneous Issues (Air Quality, Transportation, Noise, Waste Management, Permitting)

Following is a brief summary describing the methodology and findings of the ER.

The project impact area is shown Exhibit 1 within the ER. Work on the ER was initiated by sending letters soliciting comments on the project to various agencies and interested parties. Included with these letters was a description of the project, location map, and project details map. The goal was to identify all resources that could be adversely affected by the project, to avoid these adverse effects, or if unavoidable, to mitigate the effects. The solicitations were sent to the following agencies:

- McLeod County Planning and Zoning

- McLeod County Commissioner
- McLeod County Public Works
- McLeod County Historical Society
- McLeod County Local Government Unit (LGU)
- Mid-Minnesota Development Commission
- Minnesota State Historic Preservation Office (SHPO)
- Minnesota Department of Natural Resources (MNDNR)
- Minnesota Board of Soil and Water Resources (BWSR)
- Minnesota Department of Health (MDH)
- Minnesota Pollution Control Agency (MPCA)
- Minnesota Department of Commerce
- Minnesota Department of Transportation (MnDOT)
- Minnesota State Archaeologist (OSA)
- United States Fish and Wildlife Service
- United States Army Corps of Engineers (USACE)
- United States Environmental Protection Agency (EPA)

The solicitations were also sent to the following tribal units:

- Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
- Apache Tribe of Oklahoma
- Menominee Tribe of Wisconsin
- Spirit Lake Tribe, North Dakota
- Upper Sioux Community, Minnesota
- Cheyenne and Arapaho Tribes, Oklahoma
- Prairie Island Community in the State of Minnesota
- Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
- Santee Sioux Nation, Nebraska
- Lower Sioux Community in the State of Minnesota
- Flandreau Santee Sioux Tribe of South Dakota

As a result of the interactions with these agencies, a number of additional project related efforts were undertaken:

OSA sent a letter commenting on the project (**Exhibit 21** in the ER). OSA recommended that a qualified archaeologist conduct a survey of the project area, but a survey at the treatment ponds will not be necessary if the ponds are not expanded. Duluth Archaeology and SEH had a phone call with OSA staff on May 6th, 2020, where OSA concluded that only the new outlet to Silver Lake will require an archaeological survey.

SHPO responded to our request for project review with a request that the project undertaking is defined and the area of potential effect (APE) is determined. SHPO recommended a Phase I archaeological survey is completed for the proposed connection to Silver Lake. In addition, SHPO identified the Silver Lake Water Tower as a historic property in the project area. SHPO

recommended that a history-architecture survey be completed for any properties 45 years or older that are located within an indirect APE for this project (**Exhibit 22** in the ER).

The project was further defined after consultation with SHPO. The Silver Lake Water Tower is no longer within the project area. The water tower may be drained, but will not be demolished or rehabilitated. The recommended alternative is to construct a standpipe storage tank with a pump station north of the City Auditorium.

To address the comments from SHPO and OSA, Duluth Archaeology was hired and completed a Phase I Archaeological survey for the new outlet to Silver Lake. Duluth Archaeology also completed an architecture/history review for potential impacts from the construction of a water treatment facility (building) and a water storage facility (tank). This report is included as **Exhibit 24** in the ER.

We request that the USDA send the Duluth Archaeology report (**Exhibit 24** in the ER) and the APE project map created by SEH (**Exhibit 25** in the ER) to SHPO for comment. Duluth Archaeology will send their report to OSA, and SEH will send the APE map. We understand that the ER may need to be updated following the comments of SHPO and OSA to determine any potential effects and mitigation measures.

The proposed storm outlets are within a FEMA Zone A (100-year floodplain). The work proposed within the floodplain does not require fill, therefore, a no-rise condition is achieved. No mitigation measures will be necessary in regard to floodplains.

Should wetland impacts occur, they are likely to be temporary in nature. If wetland habitat exists along the fringe of Silver Lake, wetland impacts are likely to be permanent and will require mitigation. This will be determined following completion of a wetland delineation and established project plans.

A Public Waters Work permit from the MNDNR and a USACE Nationwide Permit will need to be obtained for any work below the OHWL of Silver Lake.

To comply with Section 7 of the Endangered Species Act, an online Section 7 consultation was completed which identified the Northern Long-eared Bat (*Myotis septentrionalis*) as potentially affected by activities in this location. One (1) migratory birds protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act were also populated by the Section 7 consultation (**Exhibit 14** in the ER).

It is anticipated that the project will not affect the Northern Long Eared Bat. The nearest hibernaculum and/or maternity roost is over 28 miles from the project area, and minimal tree clearing will be involved for the project. No adverse effects are anticipated for the migratory bird identified, as their habitat will not be affected by the proposed project. If the project schedule allows, clearing will be completed in the winter months.

The MNDNR, Division of Ecological Resources, reviewed the Natural Heritage Information System (NHIS) database to determine if any rare plant, animal species or other significant natural features are known to occur within the sections that include the project area. This correspondence with the MNDNR is included as **Exhibit 15** in the ER. The MNDNR stated that they believe the proposed project will not negatively affect any known occurrences of rare features. An NHIS database search was also completed under license number LA 1027, where it was determined that there are no rare species within a 1-mile radius of the project area.

The proposed project does not anticipate to create any significant impacts to the environmental resources in the area. Comments from SHPO and OSA on report prepared by Duluth Archaeology will be pending following the submittal of the PER/ER. The ER will be reviewed by the USDA-RD staff concurrent with the PER.

1.3 Population Trends

Table 1-1 presents historical population estimates provided by the Minnesota State Demographic Center. For the years 2000 and 2010, the estimates are the actual decennial census counts (761 and 837 respectively). Table 1-1 also contains the estimated number of households and persons per household.

Table 1-1 – Historic Population

Year	Population	Households	Persons per Household
2000	761	330	2.30
2001	773	336	2.30
2002	774	338	2.28
2003	783	343	2.28
2004	792	348	2.27
2005	793	349	2.27
2006	813	359	2.26
2007	810	359	2.26
2008	812	358	2.27
2009	806	356	2.26
2010	837	352	2.38
2011	835	351	2.38
2012	829	350	2.37
2013	821	348	2.36
2014	813	346	2.35
2015	810	345	2.35
2016	806	345	2.34
2017	805	345	2.33
2018	802	345	2.32

Table 1-2 presents population projections for the City of Silver Lake based on the Minnesota State Demographic Center's population projections for McLeod County as a whole. This methodology suggests a slight decrease in population over the next 20 years. Silver Lake is located within a 45 minute drive of the Twin Cities' west suburbs. As such, there is opportunity for City growth as an area with affordable housing and access to metro employment. There are preliminary plans for a new construction housing development on the east side of the City.

Table 1-2 – Population Projections

	2015	2020	2025	2030	2035	2040
McLeod County*	36,428	36,373	36,187	35,979	35,822	35,691
% Change for McLeod County		-0.15%	-0.51%	-0.57%	-0.44%	-0.37%
Silver Lake Projected Population (based on McLeod County % Change)	810	809	805	800	797	794

**Projections from Minnesota State Demographic Center*

1.4 Community Engagement

A public hearing on this PER and the companion ER was scheduled for March 24, 2020. This hearing was cancelled in response to the state social distancing requirements related to COVID-19.

An online public hearing on this PER and the companion ER was held on June 4, 2020. The public hearing included a presentation by John Rodeberg, the City's engineer, and Shannon Sweeney, a financial advisor with David Drown Associates. Discussion included City infrastructure condition, issues with I/I (inflow and infiltration), street condition, and possible funding scenarios. Minutes from the meeting are included in Appendix 19.

2 Existing Facilities

2.1 Location Map

Figures 2–4 show the existing sanitary sewer, water main, and storm sewer systems for the City of Silver Lake within the project limits.

The wastewater stabilization pond for the City of Silver Lake is located northeast of the city limits, adjacent to Otter Creek. The City of Silver Lake owns and operates three lift stations. Main (or West) lift station is located north of the baseball field between Main Street W and TH 7, west of Lane Avenue. Cleveland lift station is located on Cleveland Street approximately 150 feet east of the intersection Lake Avenue S and Cleveland Street. Century lift station is located on Century Lane, approximately 500 feet west of Jade Road. The locations of the lift stations are presented in Figure 3 and the wastewater stabilization pond map is presented in Appendix 1.

2.2 History

2.2.1 Sanitary Collection, Water Distribution, and Storm Sewer

The City's wastewater collection system was constructed over time between the early 1900's and the present. Prior to the late 1970's, vitrified clay pipe (VCP) was the primary pipe material used. Starting in the late 1970's, gasketed polyvinyl chloride (PVC) pipe was the primary material used. The system has approximately 27,940 feet of sanitary sewer main ranging in size from 8 inches to 12 inches in diameter.

The water distribution system was constructed over time beginning with the construction of the elevated water storage tank in 1916. The system consists of water mains, valves, hydrants, and services. There are approximately 35,437 feet of water main in the City of Silver Lake, ranging in size from 4 inch to 10 inch diameter. Cast iron pipe (CIP) was the primary water main material

until the late 1970's, after which PVC water main with tracer wire and DIP water main was installed. Hydrant spacing is shown in Figure 2. There is no additional information available for tracer wire, service lines, curb stops or cover depth. There is no additional information available regarding gate valves and curb stops. City has not reported any pipe failures in the past five years. There are 64 total hydrants within the city limits, of which 35 are over 30 years old according to public works staff. The water meters were replaced throughout the City in 2016 and are in good working condition.

The existing storm sewer system was constructed over time. It was likely a combined system with sanitary sewer in the early years of the City. The storm sewer discharges through multiple outlets into Silver Lake. The City has taken action to identify inflow within the past 5 years. The City has televised the sanitary sewer system and smoke tested sanitary manholes. There are no known storm sewer-to-sanitary sewer connections.

The City does not have data related to diameter, material and age for the vast majority of the storm sewer within the city limits. A survey of the proposed project area will be completed as part of the final design process. Based on limited information from the City, the storm sewer within the project area is almost all 12-inch diameter or smaller. The ages of the pipes are unknown, and the pipe materials vary between clay, plastic and concrete. The total lengths of pipes to be removed within the project area is estimated at 7743 feet. All available storm sewer data has been included in Figure 4.

The existing storm drainage system within the project area is inadequate by modern standards. Storm sewer mains are too small to handle even 2-year storm intensities, and some mains have collapsed or are blocked with debris. The catch basin grates frequently get clogged and have insufficient capacity even when they are clean. Lack of grate and pipe capacity cause significant bypass flow along the streets even in relatively minor storm events, leading to additional wear and tear on street pavement. The storm bypass flows go to the low points near the intersection of Nome Avenue and Frank Street, leading to localized flooding that overtops the curb and spreads onto private property. Additional information related to flooding during specific measured storm events is not available.

City public works staff said that the storm outlet near the Lane Avenue-Main Street intersection has collapsed. Public works staff also said that the storm pipe between Lake Avenue and Grove Avenue south of Merrill Street has been televised. This pipe has a metal rod that has pierced through the pipe, which collects debris and reduces pipe capacity. CB debris is removed consistently by public works staff. Existing inlet grates are typically 18-inch square grates with diagonal openings. Based on the information available from the City, pipe diameters of storm pipes throughout the project area are typically 12 inches or less.

2.2.2 Water Supply, Storage and Treatment

The City owns and operates two wells. Both wells are located in the Quaternary Buried Artesian aquifer and are between 220 and 235 feet deep. Constructed in 1974, Well 2 is the primary water supply for the City with a pumping capacity of 275 gpm, and Well 1, constructed in 1964, is used for emergency backup with a pumping capacity of 260 gpm. Chlorine, fluoride and corrosion protection are fed at Well 2 prior to being conveyed to the elevated water tower. The City's elevated water storage tank is a multi-column standpipe design with a 60,000 gallon capacity and was constructed in 1916.

2.2.2.1 Water Demand

The City pumps on average 69,000 gallons per day (GPD) with a recorded maximum volume of 126,000 gallons in 2010. A summary of historical pumping data over the last 10 years can be found in Appendix 2.

2.2.3 Wastewater Treatment

The City of Silver Lake replaced its mechanical treatment plant with the current stabilization pond in 1987. The project included construction of the Main lift station and force main to connect to the pond. Electrical improvements to the Cleveland lift station were also performed with this project. The City does not have records for the construction of the Cleveland lift station but the pumps in the station were replaced in the 1990s. In 2003, the City constructed Century lift station to service a 24-lot subdivision.

1. Main Lift Station has been bypassed on several occasions due to high rain events. Lift station was bypassed due to a 3 inch rain event. June 22, 2016
2. Lift station was bypassed due to a 2.25 inch rain event. August 30, 2016
3. Lift station was bypassed due to a 3.5 inch rain event. October 13, 2017
4. Lift station was bypassed due to generator mechanical failure during a power outage. July 8, 2019.

Century Lift Station has not had any issues meeting capacity as it only services a small subdivision.

Cleveland Lift Station force main has blown out several times in the past, but not in the last five years. Two force main connect the Cleveland and Main lift stations, a 4 inch pipe and 6 inch pipe. Both have experienced blown holes due to pressure from high flows.

Sewage had to be pumped out of sanitary sewer manholes on three occasions over the past three years:

1. The air release valve between the Main Lift Station and ponds failed, causing wastewater to flow into the street when pumps were running. Date: June 14, 2018
2. Grease buildup caused the sanitary sewer line to backup into a residential basement. A sump pumped the water to the street. Date: July 30, 2020
3. The Cleveland Ave Lift Station had an electrical issue which took both pumps out of service. Wastewater was temporarily pumped onto the street to avoid sewer backups into homes. Date: March 17, 2021

The ponds have had no bypassing or abnormal discharging events in the last five years. There is one instance of high TSS and CBOD, which occurred in April 20, 2016. There have been two occurrences of pH above 9.0 due to algae.

Appendix 8 (page 6-7 of 13) includes a record of prohibited releases and incidents, eight of which occurred between 2016 and 2019. Most of the events were collection system releases, with the exception of one release due to a basement backup and one Facility wet weather release.

The Silver Lake WWTF is currently operating off of a 2015 permit, as the MPCA has not reissued the permit. The MPCA sent a letter in May 2020 (See Appendix 12) stating that a new phosphorus limit may be added to the reissued permit. A specific deadline for this new limit was not set, as the MPCA has not issued a new permit. The proposed upgrades listed in this report address the new expected phosphorus limit of 2 mg/L.

2.2.3.1 Wastewater Flows

Pump run times are used to determine flow. The average daily flow as provided in the monthly DMRs, broken down by month, is presented in Table 2-1.

Table 2-1 – Annual Average Flows to Ponds

Month	2016	2017	2018	2019
Units	MGD	MGD	MGD	MGD
January		0.13	0.09	0.09
February		0.14	0.08	0.08
March		0.14	0.12	0.17
April		0.18	0.24	0.33
May		0.26	0.18	0.20
June		0.14	0.25	0.17
July		0.13	0.16	0.20
August		0.14	0.10	0.12
September	0.20	0.10	0.11	0.17
October	0.18	0.24	0.13	0.26
November	0.15	0.13	0.11	0.14
December	0.16	0.10	0.09	
Annual Average	**0.17**	**0.15**	**0.14**	**0.18**

A description of the equipment used to obtain flow data and calibration of equipment is included in Appendix 8. DMR reports (raw data) are provided in Appendix 20.

The equipment is calibrated once per year; however, the permit required that calibration occurs twice per year. Records are only available for October 2016 and October 2017.

2.2.3.2 Inflow and Infiltration (I/I)

Data from the DMR reports for WS 001 was used to estimate the average wet weather flow, average dry weather flow, and I/I. The results of this analysis is included in Appendix 21.

The Average Dry Weather Flow (ADW) was determined based on the average flow over the driest 20 days of minimum rainfall. The ADW was calculated as 0.074 mgd. The Average Wet Weather Flow (AWW) was determined based on the average flow over the wettest 180 consecutive days between November 15 and May 15 (±15 days), or May 15 and November 15 (±15 days). The AWW was calculated to be 0.189 mgd. A summary of the estimated inflow and infiltration and the required I&I reduction to get back to rated pond capacity is presented in Table 2-2.

Table 2-2 – Inflow and Infiltration Summary

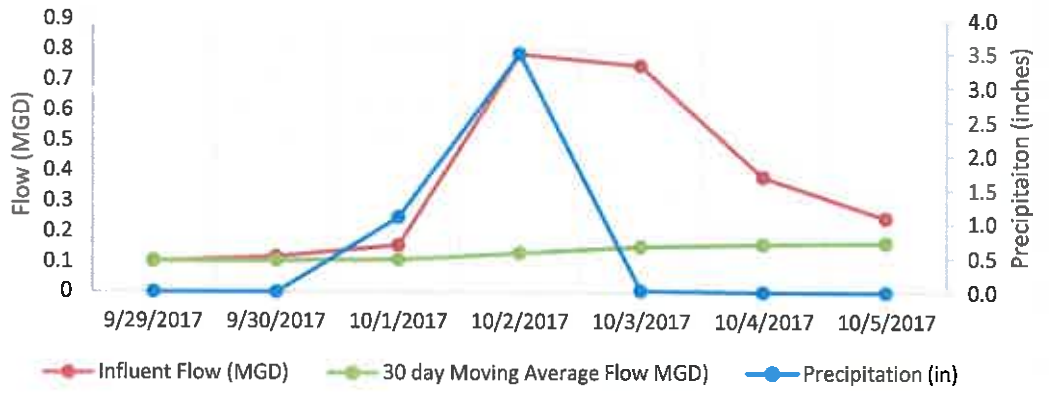
AWW & ADW based on current flows to the Pond		Difference between the AWW and Pond Permitted flow		Difference between the AWW and 80% of the Permitted Flow	
AWW	0.189 mgd	AWW	0.189 mgd	AWW	0.189 mgd
ADW	0.074 mgd	Permit	0.139 mgd	80% Permit	0.111 mgd
I/I	0.115 mgd	Required Reduction	0.050 mgd	Required Reduction	0.078 mgd

The City has approximately 0.115 mgd of I/I. If the City would like to reduce I/I to meet the capacity of the wastewater stabilization pond, then a reduction of approximately 0.050 mgd is required. If the City would like to reduce to approximately 80% of the ponds capacity to allow for growth, then approximately 0.078 mgd is required.

The effects of I/I can be seen in the impact of a significant precipitation event on the daily flow. The largest precipitation event from 2016 to 2019 occurred on October 2, 2017, a 3.5 inch rain event. Exhibit 1 displays the effect of the precipitation on the influent flows.

The 3.5 inch rain event corresponded to an increase of approximately 1.62 MGD over the 7 day period.

Exhibit 1 – Inflow due to 3.5 inch Storm Event



The 3.5 inch rain event corresponded to an increase of approximately 1.62 MGD over the 7 day period.

Further discussion of I/I is provided in Appendix 8.

2.3 Condition of Existing Facilities

2.3.1 Sanitary Collection, Water Distribution, and Storm Sewer

2.3.1.1 Sanitary Collection

The sanitary distribution system has high levels of I/I. The recent National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permit for the treatment ponds allows 0.132 MGD for average wet weather flow. The average dry weather flow is 0.074 MGD, and the average wet weather flow is 0.189 MGD which exceeds the permitted flow.

VCP was the primary sanitary pipe material used prior to the late 1970's. After the late 1970's, gasketed PVC pipe was used. Table 2-3 summarizes the sizes and quantities of the existing sanitary collection mains within the City. Figure 3 shows the existing sanitary collection system for the City of Silver Lake.

Table 2-3 – Silver Lake City Total Existing Sanitary Sewer Main

Pipe Diameter (Inches)	Pipe Type	Footage
12	VCP	2,890
8	VCP	17,811
8	PVC	7,239
Total Footage		**27,940**

Nearly all of the existing sanitary mains within the project area are VCP of an age that the City doesn't have information regarding their date of construction. Televised inspections from 1993, 1994, and 2016–2019 show VCP sanitary mains with substandard service connections, broken, misaligned and sagging pipes, and many instances of active infiltration. Televising reports from 1995–1999 show that the vast majority of the service lines have leaks. Service lines observed by City staff were VCP or old concrete field tile laid end to end without water-tight joints. According to the City, there have been no pipe failures in the past five years. Based on the televising information and City staff observations, both the sanitary mains and service pipes are sources of I/I. Active infiltration was observed in mainline televising, but active inflow was not observed in televising. Televising videos are available upon request. There are 105 sanitary manholes within the City, of which 42 are reinforced concrete, 32 are brick, and 31 are block. Beyond the televising previously noted, the City has taken action to identify inflow and infiltration within the past 5 years. These actions include smoke testing sanitary manholes and inspecting homes to verify sump pumps are not connected to the sanitary sewer. The City has verified there are no sump pump connections.

2.3.1.2 Water Distribution

The primary water main material used until the late 1950's was cast iron pipe (CIP). Based on conversations with City maintenance staff, it is assumed that all water main material within the project limits is CIP. Corrosion and tuberculation can weaken CIP, reducing the inside diameter of the pipe and increasing the roughness coefficient. This has the effect of reducing flow, which leads to complaints from water users. It is unlikely that the CIP would be able to provide reliable water service over the next 40 years. Inplace condition of existing CIP water main is not known. Because of the brittleness of old cast iron, it is advisable to replace when an adjacent utility

improvement (such as sanitary sewer) is contemplated. Most water mains are installed under the same roads as the sanitary collection system, and the water main is unlikely to remain undamaged due to the disturbance caused by the replacement of the collection system. The City doesn't have specific information related to main location beyond what has been included. Location of sanitary sewer, water main, and storm sewer will be determined by survey during the final design process. Much of the existing water main has a 4 inch diameter which does not meet the required minimum diameter of the Ten States Standards (MDH). Gate valves and water service lines on public and private property are original. There are 64 hydrants within city limits, of which 35 are over 30 years old according to public works staff. City uses Banyon Utility billing software. Water meters were replaced in 2016 and are suitable for continued use. Billing system and meters are considered suitable for continued use. Table 2-4 summarizes the sizes and quantities of the existing water mains within the City. Figure 2 shows the existing water distribution system for the City of Silver Lake.

Table 2-4 – Silver Lake City Total Existing Water Main

Pipe Diameter (Inches)	Pipe Type	Footage
4	CIP	11,117
6	CIP	9,867
8	CIP	2,672
6	DIP	845
8	DIP	7,726
10	DIP	932
8	PVC	977
10	PVC	1,301
Total Footage		**35,437**

2.3.1.3 Storm Sewer

The existing storm drainage system within the project area is inadequate by modern standards. Storm sewer mains are too small to handle even 2-year storm intensities, and some mains have collapsed or are blocked with debris. The catch basin grates frequently get clogged and have insufficient capacity even when they are clean. Lack of grate and pipe capacity cause significant bypass flow along the streets even in relatively minor storm events, leading to additional wear and tear on street pavement. The storm bypass flows go to the low points near the intersection of Nome Avenue and Frank Street, leading to localized flooding that overtops the curb and spreads onto private property. Additional information related to flooding during specific measured storm events is not available.

The City doesn't have specific information related to main location beyond what has been included. Location of sanitary sewer, water main, and storm sewer will be determined by survey during the final design process.

The City does not have data related to diameter, material and age for the vast majority of the storm sewer within the city limits. A survey of the proposed project area will be completed as part of the final design process. Based on information available from the City, the storm sewer within the project area is almost all 12-inch diameter or smaller. The ages of the pipes are unknown, and the pipe materials vary between clay, plastic and concrete. The total lengths of pipes to be

removed within the project area is estimated at 7743 feet. Available storm sewer data has been included in Figure 4.

City public works staff said that the storm outlet near the Lane Avenue-Main Street intersection has collapsed. Public works staff also said that the storm pipe between Lake Avenue and Grove Avenue south of Merrill Street has been televised. This pipe has a metal rod that has pierced through the pipe, which collects debris and reduces pipe capacity. CB debris is removed consistently by public works staff. Existing inlet grates are typically 18-inch square grates with diagonal openings. Based on the information available from the City, pipe diameters of storm pipes throughout the project area are typically 12 inches or less.

2.3.2 Water

2.3.2.1 Water Treatment

The City of Silver Lake does not have a water treatment facility. The City's only source of treatment is chlorine, fluoride, and corrosion inhibitors that are fed into the system at Well No. 2 prior to distribution. The Well 2 has chemical containment tanks that were installed in 2017, a new control panel and electrical building installed in 2019, new chlorine booster pump installed in 2020, and chemical feed pumps that were rebuilt in 2020. Well 1 has no chemical feed pumps that are currently operable.

2.3.2.2 Wells

Well No. 1 was installed in 1964 and is equipped with a 260 gpm pump. In 2012 the pump impeller was rebuilt and the wear ring was replaced. Well No. 2 was installed in 1974 and is equipped with a 275 gpm pump. Both pumps are metered by 4-inch flow meters. The meter at Well 2 was calibrated in 2018 and later completely rebuilt in 2020, and the Well 1 meter is a discontinued model in need of replacement. In 2015 the Well 2 pump impeller was rebuilt. It is recommended that pumps be pulled every 7 to 10 years to be inspected.

McCarthy Well indicated that Well 2 was pulled and completely rebuilt about ten years ago and Well 1 was pulled 20 years ago where it was converted to a submersible well from a turbine type well.

Due to the age and unavailable parts needed for repair, it is recommended that the Well 1 be completely replaced. The well and pump at Well #2 is currently operating efficiently and will likely need some rehabilitation in the future by the City; however, the process piping within the Well #2 building is in poor condition and should be replaced.

The Well 2 building is a wood constructed building with an angled flat shingled roof. It has wood siding on the exterior and is in poor condition. It had a steel entry door and no windows. The exterior is lacking maintenance and is in need of being repainted. There are noticeable signs of rot and part of the eave is missing on the east side. The Well 2 building has a wood chlorine cabinet on the exterior of the building, which has been recommended by the MDH to replace. Well 1 is a block building with brick on the outside. It has a steel entry door with a flat roof. The roof was replaced in 2018. and the structure appears to be in good shape. The well piping in both wells is rusty with some scaling around the flanged and pipe fittings. Well 2 has an electric wall mount heater and Well 1 has an electric heater plugged into the wall sitting on the floor. There is no ventilation, cooling or dehumidification in either well building.

In 2019, the panel at Well 2 had new controls added. The panel has the ability to monitor the tank levels in the tower with a pressure transducer, lead/lag pump controls, chlorine booster pump control, chemical feed control, alarm status, and breakers to swap to emergency power, if needed. The Well 2 panel is equipped with a wireless dialer that monitors high/low levels, pump failures, and power outages. Well 1 is controlled via radio communications to Well 2, to start/stop when needed. A pull behind standby emergency generator (25KW, 60HZ, 3PH, 120/208V, 87 AMPS) is available to connect to an outside hookup on Well 2, however, no generator hookups are available for Well 1.

Table 2-5 summarizes Wells No. 1 and No. 2 data. See Appendix 3 for 2017-2019 well inspection reports.

Table 2-5 – Silver Lake Well Data

Well Data	Well No. 1	Well No. 2
Year Constructed	1964	1974
Well Depth (ft)	235	220
Casing Depth (ft)	182	210
Pump Type	Vertical	Vertical
Motor (HP)	20	20
Last Repaired	2012	2015
Capacity (gpm)	250	275
Static Water Level (ft)	40	41
Pumping Water Level	53	55
Use Status	Emergency	Primary Well
Electrical	200amp, 3ph, 120/240V	200amp, 3ph, 120/240V

2.3.2.2.2 Water Quality

In 2006, the City conducted a pilot study which concluded that the water quality for both wells exceed the Secondary Drinking Water Standards for iron and manganese and have high levels of ammonia. High levels of iron and manganese can result in staining, taste and odor issues. High levels of ammonia can cause disinfection issues. In addition, Silver Lake's average manganese levels have exceeded the MDH Health Based Value (HBV) of 0.10 mg/L. This value is protective of bottle-fed infants less than one year of age, the most sensitive population, as well as other populations.

There is only one water quality violation on record for the City of Silver Lake. The violation was for a failure to submit a Bac=T sample for the quarter of July 1 to September 30 in 2016.

Table 2-6 summarizes the City of Silver Lake's raw water data.

Table 2-6 – Raw Water Quality for Silver Lake

Parameter	Sample Date	Units	Well No. 1	Well No. 2	MCL or Secondary Standard
Alkalinity, Bicarbonate	7/11/2013	mg/L	420	420	
Alkalinity, Carbonate	7/11/2013	mg/L	3.1	2.8	
Ammonia-N, Total	7/11/2013	mg/L	0.56	1.05	
Arsenic	7/11/2013	ug/L	2.2	7.99	10.4
Barium	7/11/2013	ug/L	102	207	2000
Bromide	7/11/2013	mg/L	0.0237	0.0316	
Calcium as CaCO3	7/11/2013	mg/L	220	210	
Chloride	7/11/2013	mg/L	0.64	1.36	250
Iron	7/11/2013	ug/L	509	999	300
Manganese	7/11/2013	ug/L	106	77.9	50
Nitrite-N, Total	7/11/2013	mg/L	0.01	0.01	
Magnesium as CaCO3	7/11/2013	mg/L	170	160	
pH	7/11/2013	SU	7.9	7.8	
Phosphate, Total	7/11/2013	mg/L	0.078	0.182	
Potassium	7/11/2013	mg/L	2.95	2.96	
Sodium	7/11/2013	mg/L	30.7	41.4	
Strontium	7/11/2013	ug/L	351	382	
Sulfate	7/11/2013	mg/L	22.8	28	250
Total Organic Carbon	7/11/2013	mg/L	2.2	2.7	

Source: MDH

2.3.2.3 Water Tower

The City's elevated water storage tank is a multi-column standpipe design with a 60,000 gallon capacity and was constructed in 1916. Throughout that time, the tower hasn't proved to be a major pain point for the City. Ground inspection noted that the lower legs and bases were cracked, peeling, and heavy paint build in areas, as well as obvious peeling paint on the shell on the tank. It is unknown when the last time that the water tower interior and exterior was sand blasted and recoated. It is likely that maintenance and recoating would be required in the immediate future. Due to water tower being identified by SHPO as a historical site, it is likely that there will be limitations with what work can be done.

In addition to the age and need for maintenance, the existing water tower is undersized and does not provide the required storage for existing and current demands. 10 States Standards (TSS, 2018) 7.0.1 recommends a minimum storage volume of the average daily demand and, where fire protection is provided, fire flow demands. With the average daily water use for the City of Silver Lake of 69,000 gallons per day (GPD) and an expected fire-fighting usage of 15,000 gallons for a residential fire, the existing water tower is not meeting the minimum storage standards. If this tower is rehabilitated and continued to be used as the City's source for storage the system will still require additional storage elsewhere. The age of the water tower should be taken into consideration, when evaluating the condition, compliance, and need for maintenance to keep it online for future water storage.

2.3.3 Wastewater

2.3.3.1 Wastewater Stabilization Pond

The City of Silver Lake treats domestic wastewater through a three-cell wastewater stabilization pond. Raw wastewater is metered by pump run time at the Main lift station. The Main lift station collects the City's raw wastewater and pumps to the primary pond splitter box. The primary pond splitter box divides flow between the two primary pond cells. A transfer structure allows flow between the cells be isolated such that cells can be operated in series, parallel or bypassed. Valves in the pond transfer structures direct flow between the primary pond and secondary pond, and from the secondary pond to the outfall. The secondary pond consists of one cell and can be bypassed from the primary control structure to the secondary control structure. The facility seasonally discharges to Otter Creek, County Ditch #8. Appendix 4 presents a flow diagram for Silver Lake's wastewater stabilization pond.

The primary pond is operated between 2 and 6 feet. Six feet separate the primary pond bottom and the secondary pond bottom. The secondary pond is operated between 2 and 8 feet. The total storage volume for the primary and secondary ponds is 76.83 ac-ft. The surface area of the primary pond at the mean operating level of 4 feet is 7.08 acres. The primary and secondary pond configuration generally meet design standards from MPCA's "Recommended Pond Design Criteria", 2009. Tables 2-7 and 2-8 present the primary pond and secondary pond elevation, depth, area, and volume.

Table 2-7 – Primary Pond Elevations and Area

Description	Primary Pond		Cell 1		Cell 2		Total	
	Elevation	Depth	Area	Volume	Area	Volume	Area	Volume
Bottom Elevation	1042	0 ft	3.11 ac	-	3.11 ac	-	6.22 ac	-
Min. Water Elevation	1044	2 ft	3.32 ac	6.43 ac-ft	3.32 ac	6.43 ac-ft	6.64 ac	12.86 ac-ft
Normal Water Elevation	1046	4 ft	3.54 ac	6.86 ac-ft	3.54 ac	6.86 ac-ft	7.08 ac	13.72 ac-ft
High Water Elevation	1048	6 ft	3.75 ac	7.29 ac-ft	3.75 ac	7.29 ac-ft	7.5 ac	14.58 ac-ft
Dike Elevation	1051	9 ft	-	-	-	-	-	-

Table 2-8 – Secondary Pond Elevations and Area

Description	Secondary Pond			
	Elevation	Depth	Area	Volume
Bottom Elevation	1036	0 ft	7.15 ac	-
Min. Water Elevation	1038	2 ft	7.52 ac	14.67 ac-ft
Normal Water Elevation	1041	5 ft	8.09 ac	23.41 ac-ft
High Water Elevation	1044	8 ft	8.66 ac	25.12 ac-ft
Dike Elevation	1047-1051	11-15 ft	-	-

Each pond consists of several layers and components. The status of the major parts of the ponds are discussed in the following sections. A detailed inspection of the WWTF is provided in Appendix 8.

2.3.3.1.2 Primary Ponds

Liner: constructed from 12-inches of clay (based on drawings provided by the City). During an inspection in June 2019, MPCA noted deep rooted vegetation such as cattails or reeds in the primary ponds. Deep rooted vegetation should be removed and root damage repaired as annual maintenance. If left unaddressed the liner can be compromised. The liner is in acceptable condition.

Dike: missing gravel on the top of the dike has caused difficulty to travel around the ponds during the spring and during wet periods of the year. During an inspection in June 2019, MPCA noted vegetation and trees growing in the rip rap. If left unaddressed the dike can be compromised. The drive surface of the dike is in poor condition and is not mowed frequently enough to prevent erosion of the dike surface. The slopes of the dike are in acceptable condition.

Riprap: has deteriorated in spots and is no longer adequate size to protect the dike from erosion. Vegetation has overgrown the riprap throughout the ponds, especially in the southeast pond where the riprap is not visible due to vegetation.

Solids: solids have not been removed since construction of the stabilization system. Buildup of solids has been noted near the inlet structures of each cell and east edge of the east cell. The solids along the east edge are due to the dumping from a septate hauler. Sludge sampling in the primary ponds was performed in the summer of 2020. See Appendix 15 for a copy of the sludge sampling results and original pond plan drawing. The average sludge depth in the west cell is approximately 3.5 inches. The maximum sludge depth was 5 inches and the minimum sludge depth was 2 inches. In the east cell, concentrated locations of sludge depth were located in the northeast corner and at the center of the east edge. In these two locations the sludge was measure at 22 inches. Outside of these locations the average sludge depth was, 3.8 inches. The maximum sludge depth was 22 inches and the minimum sludge depth was 3 inches.

Splitter Box Structure: is a 96-inch concrete structure. A weir wall divides flow from the 8-inch influent force main between the two cells. Slide gates over the weir wall allow for the isolation of each cell. The splitter box and valves are original and in poor condition.

Cell 1 and 2 Inlet Structure: is a concrete apron approximately 6 feet long by 7 feet wide. The inlet pipe is 10-inch ductile iron pipe. The inlet structures are original and in poor condition.

Cell 1 and 2 Outlet Structure: is a 48-inch diameter precast concrete section maintaining a 2-foot water level in the cells. A concrete removable plug allows the ponds to be drained. The outlet structures are original and have settled off their foundations and are tipping sideways. See photos of southwest pond in Appendix 8.

Transfer Structure: is a 48-inch diameter concrete structure, with 10-inch ductile iron pipe extending into each cell. The sluice gate, which controls flow between the cells no longer operates due to breakage from ice, prevents flexibility in the facility's operation. Upturned pipe maintains a 2-foot depth in each cell. The transfer structure and valves are original and are currently inoperable.

Primary Pond Control Structure: is a 96-inch diameter concrete structure. Gate valves and a slide gate control the pond elevations in the primary cells. Slide gates are not preferred for control structures. From MPCA's "Recommended Pond Design Criteria", 2009, telescoping valves are a preferred because they provide more operational flexibility. The primary pond control structure and valves are original and have broken due to ice. The structure is inoperable.

Fence: is in poor condition. The existing fence is post and wire, only approximately 4 feet high and is not capable of restricting unauthorized entry to the site.

2.3.3.1.3 Secondary Pond

Liner: is constructed from 12 inches of clay (based on drawings provided by the City). During an inspection in June 2019, MPCA noted deep rooted vegetation such as cattails or reeds in the primary ponds. Deep rooted vegetation should be removed and root damage repaired as annual maintenance. If left unaddressed the liner can be compromised. The liner is in acceptable condition.

Dike: is missing gravel on the top of the dike has caused difficulty to travel around the ponds during the spring and during wet periods of the year. During an inspection in June 2019, MPCA noted vegetation and trees growing in the riprap. If left unaddressed the dike can be compromised. The drive surface of the dike is in poor condition. The slopes of the dike are in acceptable condition.

Riprap: has deteriorated in spots and is no longer adequate size to protect the dike from erosion. Vegetation has overgrown the riprap, preventing the riprap from protecting the dike and liner from erosion.

Solids: solids have not been removed since construction of the stabilization system. Sludge sampling was performed in the winter of 2020. The average sludge depth was 6.4 inches. The maximum sludge depth was 8 inches and the minimum sludge depth was 4 inches.

Bypass: is an 8-inch ductile iron pipe that connects the primary pond control structure and the outfall pipe. The bypass is in acceptable condition.

Cell Inlet Structure: is a concrete apron approximately 6 feet long by 7 feet wide. The inlet pipe is 14-inch ductile iron pipe. The inlet structure is original and had corrosion on the concrete exterior of the structure.

Cell Outlet Structure: is a 48-inch diameter precast concrete section maintaining a 2-foot water level in the cells. The outlet pipe is a 16-inch ductile iron pipe. A concrete removable plug allows the ponds to be drained. The outlet structures are original and is completely inoperable. The discharge valve also had failed, but has since been replaced by a new valve approximately 15 feet from the structure.

Secondary Pond Control Structure: is a 96-inch diameter concrete structure. Gate valves and a slide gate control the pond elevations in the secondary cell. In 2019, a valve was added to the outlet pipe because the slide gate was leaking. Slide gates are not preferred for control structures. From MPCA's "Recommended Pond Design Criteria", 2009, telescoping valves are a preferred because they provide more operational flexibility. The secondary pond control structure and valves are original and have broken due to ice. The structure is inoperable.

Outfall: is 14-inch ductile iron pipe to County Ditch #8. Riprap lines the channel at the outfall. The outfall is in acceptable condition.

Fence: is in poor condition.

2.3.3.2 Lift Stations

The City owns and operates three lift stations: Cleveland, Main, and Century. Cleveland lift station receives flows south of Main Street, east of Lake Avenue, and north of Frank Street from Oliver Avenue to Grove Avenue. The Cleveland lift station is a wet well/dry well with a service building situated over the dry well. Main lift station receives flow from the entire town and pumps raw wastewater to the stabilization ponds. Main lift station consists of a wet well and a separate valve vault. Century lift station receives flow from the Silver Edge Estates First and Second Additions. Century lift station consists of a wet well and buried valves outside of the wet well. The following sections describe the status and condition of the three lift stations.

2.3.3.2.1 Cleveland

Service building: is a precast concrete structure measuring approximately 10 feet by 12 feet and is situated over the dry well. Open grated access hatch to the dry well allows airflow from the dry well into the building. The service building is in poor condition.

Wet well: is a concrete structure approximately 22 feet deep, 11 feet long by 3 feet wide. The wet well is in poor condition.

Dry well: is a concrete structure attached to the wet well and is approximately 23.5 feet deep, 11 feet long, by 8 feet wide. Dry well is in poor condition.

Pumps: two 10 hp pumps service the lift station. The City has experienced issues with the pumps not keeping up in the past and overflowing into the gravity line. The pumps are in poor condition.

Piping and valves: are original and in poor condition.

Electrical: is in poor condition.

Force main: is approximately 574 feet long and in poor condition. Blowouts have occurred on several occasions due to increased pressure in high flow events.

Generator: no generator.

Site: the site is only slightly larger than the lift station. There is no room for expansion or a new lift station.

2.3.3.2.2 Main

Wet well: is a 7-foot diameter concrete structure. Structurally stable, but showing some wear on the concrete surface. There is no vent for the wet well. The access hatch does not meet current safety standards.

Pumps: the size of the existing two pumps are unknown. The City is experiencing some pumping issues that could be due to pump size, force main size, or wet well size. The pump station has had to be bypassed on multiple occasions during high flow events, indicated that the pumps are undersized or are pumping at a low efficiency. The pumps are at the end of their service life.

Valve Vault: is a 6-foot diameter concrete structure. The valve vault houses two 6-inch check valves and two 6-inch gate valves. The valve vault is in acceptable condition but showing some wear on the concrete surface.

Piping and Valves: The inlet pipe to the wet well is a 10-inch ductile iron pipe. The discharge for each pump is a 6-inch ductile iron pipe. Two 6-inch check valves and two 6-inch gate valves are housed in the valve vault. After the valve vault the two 6-inch lines combine into an 8-inch force main. In between the structures, the pipe material is PVC. The valves are at the end of their service life, and the piping is acceptable condition. The coatings on the piping in the wet well and valve vault are in poor condition.

Electrical: is original and is at the end of its service life.

Force main: is an 8-inch PVC pipe. The approximate length is 10,500 feet. There are three air release manholes between the lift station and the stabilization pond. The air release valves are in poor condition and no longer function properly. There is no flow metering. The City is experiencing some pumping issues that could be due to pump size, force main size, or wet well size.

Generator: a portable 100 kW generator in poor condition

Site: is next to a City owned park. The lighting is poor.

2.3.3.2.3 Century

Wet well: is a 6-foot diameter structure. The wet well is in good condition.

Pumps: the size of the two existing pumps are 3 hp. The pumps do not run often and are in good condition.

Piping and valves: the inlet pipes are two 8-inch PVC pipes. The pump discharge piping are two 4-inch ductile iron pipes. Two 4-inch check valves are located inside the wet well, and two gate valves are buried just outside of the wet well. All piping and valves are in good condition.

Electrical: is original and good condition.

Force main: is 4-inch PVC, approximately 50 feet long. The force main is in good condition.

2.3.3.3 Existing Flows and Loads

The wastewater stabilization pond is permitted for 139,000 gpd. The most recent NPDES/SDS for the Wastewater General Permit was from 2015 and is included in Appendix 5.

Table 2-9 below summarizes the permitted flows and effluent limits.

Table 2-9 – Influent and Effluent Limits

Parameter	Measure	Current Limits
Influent Design	Average Wet Weather (AWW) Flow	0.139 mgd
CBOD Effluent	Monthly Average	25 mg/L
	Weekly Average	40 mg/L
Total Suspended Solids Effluent	Monthly Average	45 mg/L
	Weekly Average	65 mg/L
pH Effluent	Monthly, Minimum - Maximum	6 to 9 SU
Fecal Coliform Effluent	Monthly, Apr. 1-Oct. 31	200 per 100 mL
Phosphorus Effluent (with permit reissuance)	Calendar Year to Date Total	384 kg/yr
	Calendar Month Average (Jun-Sep)	2 mg/L
Dissolved Oxygen	Monitor Only	Monthly Average, Minimum

Source: National Pollutant Discharge Elimination System/State Disposal System – Wastewater Pond General Permit

2.4 Financial Status of any Existing Facilities

The City of Silver Lake provides water and wastewater services to residents and commercial customers, and it has an equal number of wastewater and water service connections. The City's billing data from January 2019 to December 2019 was reviewed to determine the Equivalent Dwelling Unit (EDU). Multi-family use per unit was calculated by dividing consumption by the number of units. The total flows for single family residential divided by the number of single-family residential units to determine the EDU. The average single-family water use based on the 2019 data was 101 gallons per day, thus 1 EDU is 101 gallons per day.

Commercial water use based on the 2019 data was 146 gallons/EDU/day. One EDU is 101 gallons per day, so each commercial connection equals 1.5 EDU. See Table 2-10 for EDU summary.

Dale Kosek is the public works director for the City of Silver Lake. People Service is under contract to operate the City's water and wastewater systems.

There are 6 City-owned properties that pay fees into the water, sewer, and storm sewer funds. There are no other non-revenue-generating connections for any of the utility systems.

Table 2-10 – EDU Summary – 2019 Data

Type of Connection	Number of Connections	Water Use		% of Total Water Use	EDU Per Connection	Total EDU by Connection Type
		Gallons/Year	Gallons/ Day/Unit			
Single-Family	332	12,209,394	101	77%	1.0	332
Multi-Family	80	1,836,430	63	11%	0.6	50
Commercial/ Industrial	35	1,870,665	146	12%	1.5	51
Totals	**447**	**15,916,489**				**433**

Sanitary sewer and water fees are charged to users based on drinking water meter data. See Table 2-11 for the existing rate schedule. Storm sewer fees are charged based on property classification (see Table 2-12). A tabulation of storm sewer users by category is included as Table 2-14. See Table 2-13 for a summary of utility operation and maintenance (O&M) costs from 2017–2019 (depreciation is included in the totals). Appendix 6 shows a breakout of O&M costs by category for sanitary, water and storm sewer.

Table 2-11 – Utilities Rate Schedule

	Monthly Base Rate	Rate per 1000 Gallons
Sanitary	$14.00	$10.50
Water	$14.00	$8.50

Table 2-12 – Existing Storm Rate Schedule

Residential Lots	
Apartment Units (each unit) -> **or** to apartment owner based on non-residential footage below	$1.00
Single Family Residential	$4.00
Twin Home (each unit)	$4.00
Four Plex (each unit)	$2.00
Single Family Manufactured home in Manufactured Housing Park	$1.00

Non-Residential Lots	
Up to 7,000 square feet	$8.00
7,001 to 14,520 square feet	$12.00
14,521 to 43,560 square feet	$16.00
43,561 to 87,160 square feet	$32.00
87,161 to 174,240 square feet	$48.00
over 174,241 square feet	$64.00
Vacant Lot (no structures/no hard surface)	$0.00

Table 2-13 – Historical Utility O&M Costs

	Water	Wastewater	Storm	Total
2017	$93,947	$141,577	$20,372	$235,524
2018	$104,181	$115,759	$45,229	$219,940
2019	$121,660	$150,110	$33,138	$271,770
Averages	$106,596	$135,815	$32,913	$242,411

Table 2-14 – Storm Sewer Classes and Revenue

Utility Account	Sq Feet	Class	Ref Rate	Basic System Rate	Monthly Fee
HOLY FAMILY SCHOOL	0	0	0	6	$ -
BFK MANAGEMENT MOTEL	0	0	0	6	$ -
ZIEMER PLUMBING & HEATING	6186	6	2	6	$12
CALE SCHWARZROCK	5997	6	2	6	$12
VILLAGER APARTMENTS		1	2	6	$12
FIRST COMMUNITY BANK	17226	6	2	6	$12
LAKESIDE MANOR		1	3	6	$18
UPTOWN APARTMENTS		1	3	6	$18
JERABEK'S MARKET	8155	7	3	6	$18
CUSTOM INSTALLATIONS	8307	7	3	6	$18
CITY OF SILVER LAKE FIRE HALL	9838	7	3	6	$18
BARBARA DOLEZAL	9663	7	3	6	$18
AMERICAN LEGION POST 141	11073	7	3	6	$18
PAINTERS PLUS, INC	10431	7	3	6	$18
HEIDI STUTELBERG	10982	7	3	6	$18
DSL CABINETS, INC	12588	7	3	6	$18
GRACE BIBLECHURCH	26870	8	4	6	$24
ARKADY DUDYREV	38290	8	4	6	$24
HARLANS AUTO REPAIR	16141	7	4	6	$24
SUMTER MUTUAL INSURANCE	17168	8	4	6	$24
MARESH FUNERAL HOME	30633	8	4	6	$24
CITY OF SILVER LAKE LIQUORS	29527	8	4	6	$24
CITY OF SILVER LAKE OFFICE	25078	8	4	6	$24

Utility Account	Sq Feet	Class	Ref Rate	Basic System Rate	Monthly Fee
CITY OF SILVER LAKE AUDITORIUM	28202	8	4	6	$24
STEILE CONSTRUCTION	29025	8	4	6	$24
KAZ'S	26516	8	4	6	$24
JOE & RACHEL YATES	25285	8	4	6	$24
MOONSTAR ANTIQUES & CONSIGNMENT	37599	8	4	6	$24
HUTCHINSON CO-OP	43038	8	4	6	$24
CITY OF SILVER LAKE-POOL	81000	9	8	6	$48
PRESBYTERIAN CHURCH	64712	9	8	6	$48
BFK MANAGEMENT RESTAURANT	46498	9	8	6	$48
CEDARCREST		1	10	6	$60
CITY OF SILVER LAKE-PW	104816	10	12	6	$72
PATRICK O'FLANAGAN	152163	10	12	6	$72
HOLY FAMILY PARISH WEST & SCHOOL	92839	10	12	6	$72
DOLLAR GENERAL	125820	10	12	6	$72
LAKES GAS CO	108750	10	12	6	$72
CITY OF SILVER LAKE -BALL PARK	265000	11	16	6	$96
GSL LAKESIDE ISD#2859	178509	11	16	6	$96
RESIDENTIAL			344	6	$2,064
Monthly Total					**$3,360**
Yearly Total					**$40,320**

The City has long-term debt payments for water and sewer. See Table 2-15 for a summary of water and sewer debt payments.

Table 2-15 – Utility Long Term Debt

Year	Water	Sewer	Totals
2020	$35,000	$5,000	$40,000
2021	$35,000	$5,000	$40,000
2022	$35,000	$5,000	$40,000
2023	$35,000	$5,000	$40,000
2024	$35,000	$5,000	$40,000
2025	$35,000	$ -	$35,000
2026	$35,000	$ -	$35,000
2027	$35,000	$ -	$35,000
2028	$35,000	$ -	$35,000

2.5 Water/Energy/Waste Audits

Silver Lake has not undergone a formal audit for Water, Energy, or Waste; however, they do compare water sales to water pumped annually. This process allows them to determine water loss for each year. The most recent review, in 2019, indicated that the City was selling about 75.3% of the water it pumped showing some losses in its system. This unaccounted-for water is likely the result of leaks in the distribution system, loss at meters, and City maintenance such as flushing.

3 Need for Project

3.1 Health, Sanitation, and Security

3.1.1 Sanitary Collection, Water Distribution, and Storm Sewer

The existing sanitary collection system within the project area has extremely high I/I. The high I/I creates a health and sanitation problem as the treatment pond has been operating above design flow for several years. High I/I allows increase the risk of bypassing sewage into the storm sewer during wet conditions. Replacing the sanitary sewer within the project limits will help reduce the I/I effect on the entire system and help the treatment facility handle the extremely high flows composed mainly of clear water (groundwater or surface runoff).

The existing water distribution system is old CIP water main, much of which does not meet the minimum size required by the MDH. It is unlikely that the CIP would be able to provide reliable water service over the next 40 years. Because of the brittleness of old CIP, it is advisable to replace when an adjacent utility improvement (such as sanitary sewer) is done. The water main has a high risk of damage due to the disturbance caused by the replacement of the sanitary collection system. The breaks create a health risk by allowing debris and possible contaminants into the water main. Replacement of the project area water distribution system will reduce health risks and costs associated with water main breaks while improving water pressure.

The storm drainage system within the project area has inadequate capacity and is in poor condition. The storm sewer will be replaced to preserve street pavement and reduce the effects of local flooding. Cross connections between sanitary and storm, if discovered, will be eliminated in the final design phase.

3.1.2 Water

The City of Silver Lake does not currently have a water treatment facility. The current system's only source of treatment is chlorine, fluoride and corrosion inhibitors that are fed into the system at Well No. 2 prior to distribution. The City of Silver Lake's water quality for both wells exceed the EPA's Secondary Drinking Water Standards for iron and manganese and have high levels of ammonia. In addition, Silver Lake's average manganese levels have exceeded the Minnesota Department of Health's Health Based Value (HBV) of 0.10 mg/L. This value is protective of bottle-fed infants less than one year of age, the most sensitive population, as well as other populations consumed in high quantities. It is not mandatory that water utilities remove these contaminants from the potable water supply. However, with the levels that are present in the water pumped from the City's supply wells, issues with odor, color, and staining will likely be experienced at some point by the City of Silver Lake's customers.

A pilot study for the removal of iron and manganese was completed in 2006, which can be found in Appendix 7. The pilot study recommended that the City should add a permanganate and filtration water treatment plant (WTP) to reduce the iron and manganese levels below secondary standards. The levels of both can be reduced to levels well below the secondary standards by normal oxidation with permanganate and filtration on granular media. Due to the quality of the City of Silver Lake's raw water, the City should consider planning for a water treatment plant in the future.

3.1.3 Wastewater

The wastewater treatment plant (WWTP) has been meeting effluent limits for CBOD, TSS, and pH, but Fecal Coliform was exceeded on 6/8/2017 and 5/24/2018. The operators did not attribute these exceedances to a specific event. In addition, the ponds have been overloaded, reducing the storage days from 180 days to 132 days. The phosphorous concentrations have exceeded the permit limit of 2 mg/L on 13 out of 30 data points between 2016 and 2019. The average concentrations of total phosphorous for 2016, 2017, 2018, and 2019 were 1.44 mg/L, 2.14 mg/L, 2.67 mg/L, and 1.27 mg/L. Additional chemical needs to be added in order to further reduce and control the phosphorus levels in the ponds.

The Cleveland lift station has periodically been hydraulically overloaded due to high I/I. Overloading the lift stations and the ponds storage time is not acceptable long term.

3.2 Aging Infrastructure

3.2.1 Sanitary Collection, Water Distribution, and Storm Sewer

98% of the existing sanitary mains within the project area are comprised of VCP in poor condition. Televised inspection of the system shows many areas with substandard service connections, broken, misaligned and sagging pipes, and many instances of observed, active infiltration. The majority of the system has deteriorated to a point where replacement is necessary. The poor condition of the collection system allows high levels of I/I which must be corrected as noted by the MPCA WW Compliance Evaluation Inspection Report issued in February 2020 (see Appendix 8).

In areas where sanitary sewer replacement is required to reduce I/I, there is also water main present. The stresses that the replacement of the adjacent sanitary sewer are expected to put on the brittle materials of the aging water distribution system will decrease the structural integrity of

the system. The existing water main is at high risk for failure during construction due to its age and brittle CIP material. Complete replacement of the distribution system components adjacent to any planned replacement of sanitary sewer is recommended.

The storm drainage system within the project area has inadequate capacity and is in poor condition. The storm sewer will be replaced to preserve street pavement and reduce the effects of local flooding. Cross connections between sanitary and storm, if discovered, will be eliminated in the final design phase. Storm sewer replacement will also allow for connection of sump pumps into the storm sewer through the street drain tile.

3.2.2 Water

The existing 60,000-gallon water tower was built in 1916 and has been the main source of water storage for the City in over 100 years. Throughout that time, the tower has been well maintained and hasn't proved to be a major pain point for the City. However, cities need to have enough storage to meet fluctuations of domestic water demand and provide enough storage for fire protection. It is likely that the existing tower has surpassed its useful lifespan and would require extensive rehabilitation to bring it to current standards. As part of this PER, rehabilitation of the existing water tower, as well as alternative water storage options, will be discussed in detail. If this tower were rehabilitated to operational standards, the system would still require additional storage elsewhere.

In addition to the existing water tower, Well #1 should be a priority for rehabilitation, to add redundancy to the system. Due to the age and unavailable parts needed for repair, it is recommended that the Well 1 (i.e., pump, well shaft, process piping, etc.) be completely replaced. The well and pump at Well #2 is currently operating efficiently and will likely need some rehabilitation in the future by the City, however, the process piping within the Well #2 building is in poor condition and should be replaced. It is anticipated that this will cost about $225,000 to complete.

3.2.3 Wastewater

I/I greatly impacts the WWTP and collection system. High I/I causes reduced BOD loading of the ponds, stressing the biology necessary for treating the wastewater. The ponds are currently over capacity and if the I/I is not corrected, they will continue to struggle with pond capacity. The ponds' capacity is reduced due to sand and grit from I/I in the collection system. Sources of infiltration include cracks and gaps in sewer pipe and manholes, root intrusions, and improperly sealed manholes. Sources of inflow are direct connections of stormwater into sanitary sewers, such as catch basin leads, sump pump leads, foundations drains, and roof drains. Broken manhole covers and improper manhole cover types are additional sources of inflow. I/I increases as infrastructure ages and breaks down. Repairing and updating infrastructure is essential to avoid I/I issues in their system.

3.3 Reasonable Growth

3.3.1 Sanitary Collection, Water Distribution, and Storm Sewer

Tables 3-1 and 3-2 present historic population and population projections for the City of Silver Lake based on the Minnesota State Demographic Center's population projections for McLeod County as a whole. This methodology suggests a slight decrease in population over the next 20 years. Silver Lake is located within a 45-minute drive of the Twin Cities' west suburbs. As such,

there is opportunity for city growth as an area with affordable housing and access to metro employment. There are preliminary plans for a new construction housing development on the east side of the City.

Table 3-1 – Historic Population

Year	Population	Households	Persons per Household
2000	761	330	2.30
2001	773	336	2.30
2002	774	338	2.28
2003	783	343	2.28
2004	792	348	2.27
2005	793	349	2.27
2006	813	359	2.26
2007	810	359	2.26
2008	812	358	2.27
2009	806	356	2.26
2010	837	352	2.38
2011	835	351	2.38
2012	829	350	2.37
2013	821	348	2.36
2014	813	346	2.35
2015	810	345	2.35
2016	806	345	2.34
2017	805	345	2.33
2018	802	345	2.32

Table 3-2 – Population Projections

	2015	2020	2025	2030	2035	2040
McLeod County*	36,428	36,373	36,187	35,979	35,822	35,691
% Change for McLeod County		-0.15%	-0.51%	-0.57%	-0.44%	-0.37%
Silver Lake Projected Population (based on McLeod County % Change)	810	809	805	800	797	794

**Projections from Minnesota State Demographic Center*

3.3.2 Water

Major growth in Silver Lake is not anticipated as a drive for these projects. It is assumed that the current population will be maintained. As discussed above, the water storage should be addressed immediately and will need to increase to meet current demands, therefore, it is recommended that the City's water storage capacity should increase to meet all current and future demands.

However, Ten State Standards (TSS, 2018) 7.0.1 recommends a minimum storage volume of the average daily demand and, where fire protection is provided, fire flow demands. With the monthly and average daily water use for the City of Silver Lake is 69,000 gallons per day (GPD) and current fire-fighting practices in Minnesota use an average of 15,000 gallons of water for a

residential fire, the existing water tower is not meeting the minimum storage standards. Without acceptably meeting minimum storage requirements, a water system cannot meet demands during the periods of maximum use without reducing pressure below an acceptable limit. Therefore, the City's water storage capacity should plan to increase to, at a minimum, 84,000 gallons, in order to meet current and future demands.

Also, if the City decides to pursue the construction of a new WTP, a 20% increase in maximum day demand is recommended to account for current and future demands. With a recorded maximum usage volume of 126,000 gallons in 2010, a WTP with a design capacity of 150,000 gallons per day (GPD) should meet all current and future demands.

3.3.3 Wastewater

The City cannot expand without addressing hydraulic overloading of the ponds. Once addressed, the City will be in a position to consider future expansion.

4 Alternatives Considered

4.1 Sanitary Collection, Water Distribution, and Storm Sewer

4.1.1 Alternative Considered – Do Nothing

4.1.1.1 Description

Maintain existing sanitary systems in current condition. This option would lead to increasing frequency of collapses, backups, with more severe I/I. Since the treatment ponds already exceed permitted flows, the MPCA would require corrective action.

Maintain the current water system. System reliability would decline with age as water main breaks requiring costly repairs become more common.

Because this option ensures system unreliability and eventual failure, doing nothing is not considered feasible.

4.1.1.2 Design Criteria

There is no design criteria for this alternative.

4.1.1.3 Map

Maps of the existing system can be found in Figures 2, 3 and 4.

4.1.1.4 Environmental Impacts

Additional clear water will continue to be passed through the City's collection system and treatment ponds. This will result in more frequent system backups, overflow sewage pumping into the storm sewer, and continued violation of MPCA permit limits. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.1.1.5 Land Requirements

The existing systems are on City property or within public right-of-way. No additional land is required for this option.

4.1.1.6 Potential Construction Problems

Spot repairs to the deteriorating system often need to be completed on short notice. These repairs may be required at any time of the year, including when frost depth requires significantly higher costs.

4.1.1.7 Sustainability Considerations

Utilizing the existing systems until failure is sustainable from a material standpoint, but for reliability, the City cannot sustain repeated breaks and repairs. The MPCA will require corrective action to address the treatment system flows that exceed permitted limits.

The I/I, if left unaddressed, will require pumps in the sanitary collection system to use additional energy. No green infrastructure improvements are applicable.

4.1.1.8 Cost Estimate

A detailed cost estimate for the Do-Nothing option has not been prepared. The unpredictable timing, location, and amount of collection and distribution system failures make it nearly impossible to quantify.

4.1.2 Alternative Considered – Open Cut Sanitary Sewer with Limited CIPP Lining, Water Distribution System Replacement

4.1.2.1 Description

The open cut sanitary sewer option calls for full replacement of all sanitary and water main line pipes and structures within the right-of-way. Sanitary service pipes are replaced up to the ROW to address I/I. Storm sewer is replaced, followed by reconstruction of the street base and pavement. Old pipe such as VCP and CIP is replaced with modern materials such as PVC or high-density polyethylene (HDPE). Cross connections between sanitary sewer and storm sewer are corrected, reducing or eliminating inflow of stormwater into the sanitary system. One of the primary objectives of the project is to reduce I/I by replacing old, deteriorated sewer mains. In the areas where this work is proposed, the water main is of a similar vintage. Consequently, the water main is proposed to be replaced in these areas as well.

Cured-in-place pipe lining (CIPP) will be utilized to rehabilitate some existing sanitary mainline and service pipes for both alternatives. Sanitary sewer televising was reviewed to determine which segments would be most cost-efficiently repaired by lining and by full replacement. Service laterals that are lined will be lined to the building to address I/I. The only difference between the two build options is the amount of open cut sanitary replacement compared to CIPP lining. See Figure 8 to view which areas will have CIPP lining and open cut sanitary sewer replacement.

Full replacement of water main and services to the ROW within the project area is proposed for both alternatives. The existing water distribution system has many areas of old, undersized, CIP water main that are susceptible to breaks. Because of the brittleness of old cast iron, it is advisable to replace it anytime an adjacent utility improvement (such as sanitary sewer) is contemplated. Water services are replaced to the right-of-way line, eliminating the leaks at the existing connections to the main line.

4.1.2.2 Design Criteria

A goal of the project is to bring the sanitary treatment ponds into compliance with MPCA permitting limits by reducing I/I. Based on the televising information and City staff observations, both the sanitary mains and service pipes are sources of I/I. The televising data, including service locations, defects, and observed active infiltration found were reviewed to identify areas for improvements that were most likely to provide a decrease in I/I. The design criteria for the gravity wastewater collection system, as mandated by the MPCA is as presented in the Ten State Standards. These design criteria include minimum sizes and grades for collection mains and spacing of manholes. All replacement sewer mains will be constructed of gasketed, non-corroding, strong, and flexible modern pipe material. Manholes will be precast with integrally cast bottoms and inverts, self-sealing boots, joint gaskets and seals, and external chimney seals. All service connections will be made using gasketed fittings compatible with the pipe material used. Services will be replaced from the main to the buildings.

For sanitary lining areas, existing pipes are lined in the identical alignment and grade without excavation. A modest improvement in manning's roughness coefficient can be realized with the new solid pipe, but general flow characteristics will not be changed. Sanitary manholes consisting of block, or precast structures in poor structural condition will be spin cast with a cementitious material to provide structural integrity and prevent I/I. In structures where a structural concern is not noted, an epoxy lining will be utilized to seal the structure. In addition, manholes will have either internal or external chimney seals installed to reduce inflow. In cases where the rings are in fair condition, the internal seals will be used. Where the rings require replacement, the external seals will be used. Each manhole will be logged, photographed, and tested for soundness during final design in this alternative.

Improvements to the adjusting rings will be made under two conditions.

- If the rings show wear, deterioration, or active infiltration.
- If the rings are in excess of 1 foot in depth the rings will be replaced with a 12 inch section.

Leaking joints in the manhole will be sealed with a chemical grout to stop active infiltration and prevent future leaking joints. All pipe doghouses will be injection grouted to avoid water "following the pipe" that formerly entered through the joints. Concrete used to grout manhole doghouses in the past is prone to leaking, and seals from the date of this system installation have outlived their design lives.

The design criteria for the water distribution system is as mandated by the MDH and as presented in the Ten State Standards. The design criteria include minimum sizes for distribution mains, and provision and location of valves and hydrants.

The design criteria for the storm drainage system will be based off the MnDOT Drainage Manual which uses a number of factors including, but not limited to, drainage area, land use, roadway design, inlet spacing, and inlet size, to determine number of catch basins and pipe sizes. The City is the owner of the streets within the project area, so although the manual will be used as a guide, in some cases all of the design criteria may not be met or it may be exceeded to ensure enough capacity in flood-prone areas. A 10-year design storm is assumed, however different design storms may be used in final design.

4.1.2.3 Map

The map showing proposed utility improvements can be found in Figure 7. Open cut sanitary collection replacement, CIPP lining, water distribution, and storm sewer improvements are shown. Regardless of the alternative, the project impact area is the same.

4.1.2.4 Environmental Impacts

Replacement of portions the existing sanitary, water and storm sewer systems will involve typical reconstruction methods in an already fully developed urban setting. There are no anticipated impacts to the local floodplains, wetlands, or other important land resources as a consequence of construction.

4.1.2.5 Land Requirements

Most proposed storm sewer, sanitary and water systems are located within public rights of way. The City will obtain a permanent easement for a proposed storm sewer outlet to the lake south of the Lane Avenue and Main Street intersection. The City plans to purchase the lot on the northeast quadrant of Cleveland Street and Lake Avenue for purposes of building the new lift station. The estimated cost to acquire the permanent storm sewer easement is $10,000 and the estimated cost for the proposed lift station lot is $25,000.

4.1.2.6 Potential Construction Problems

No unusual conditions or difficulties are anticipated for the reconstruction of the wastewater, water, or storm sewer systems.

4.1.2.7 Sustainability Considerations

4.1.2.7.1 Water and Energy Efficiency

Reducing I/I in the system will reduce lift/pump station electricity use. Wastewater treatment efficiency will be improved by reducing the clean water treated in the system.

4.1.2.7.2 Green Infrastructure

No green infrastructure considerations are part of this alternative.

4.1.2.7.3 Other

The sanitary collection system proposed is generally the same as the City currently has, except for the proposed pipe material, and is the standard system for most municipalities.

The water distribution system proposed is generally the same as the City currently has and is the standard system for most municipalities. There are no feasible alternatives to this type of system for water distribution.

The storm sewer proposed is generally the same as the City currently has and is the standard system for most municipalities. Installing larger catch basin grates should increase pavement life by capturing a higher rate of flow, reducing the effects of high gutter flows and the time that water is pooled on the pavement.

4.1.2.8 Cost Estimate

Table 4-1 presents estimated construction costs for all of the proposed improvements to the sanitary, water, storm sewer and street improvements included in the open cut alternative. The detailed cost estimate for this alternative is included in Appendix 17. O&M costs will not change

from existing for either alternative since the City operates and maintains similar systems currently. Since O&M remains constant, and non-construction costs are a function of estimated construction costs, alternatives have been evaluated solely on their estimated construction costs. See the Existing Facilities section of this report for existing O&M costs. An estimate of construction and non-construction costs will be shown in the Proposed Project (Recommended Alternative) section.

Table 4-1 – Estimated Construction Cost for Open cut Alternative

Street	From	To	Estimated Construction Cost				
			Wastewater Eligible	Water Eligible	Storm Eligible	City Cost (Not Eligible)	Total
LANE AVE	MAIN ST	T.H. 7	$454,338	$406,676	$450,695	$151,271	$1,462,982
FRANK ST	LANE AVE	LAKE AVE	$931,568	$826,188	$500,099	$364,765	$2,622,620
CENTER ST	LANE AVE	SUMMIT AVE	$495,859	$718,583	$936,583	$355,780	$2,506,805
OLIVER AVE	MAIN ST	FRANK ST	$252,989	$301,667	$375,032	$99,443	$1,029,131
PARK AVE	MAIN ST	T.H. 7	$428,158	$548,527	$45,110	$209,420	$1,231,215
QUEEN AVE	CENTER ST	FRANK ST	$135,426	$145,179	$14,990	$43,240	$338,835
RICE AVE	CENTER ST	FRANK ST	$115,277	$126,108	$11,578	$37,804	$290,767
SUMMIT AVE	CENTER ST	FRANK ST	$144,835	$112,759	$67,483	$59,295	$384,372
CLEVELAND AVE	PARK AVE	EAST ST	$755,996	$686,477	$212,467	$271,426	$1,926,366
TOWER ST	CLEVELAND AVE	MAIN ST	$97,596	$185,237	$22,885	$97,889	$403,607
LAKE AVE	MERRILL ST	MAIN ST	$300,889	$306,723	$317,214	$210,046	$1,134,872
MERRILL AVE & EAST OF GROVE	LAKE ST	GROVE AVE	$48,125	$62,264	$138,574	$16,534	$265,497
CENTER ST/NE EAST AVE/ FRANK ST	GROVE AVE	GROVE AVE	$447,168	$461,309	$48,853	$142,477	$1,099,807
C.R. 92	W OF GROVE ST	W OF CENTURY AVE	$455,631	$453,694	$432,582	$238,059	$1,579,966
SANITARY SEWER EXTENSTION & LINING AREAS			$1,568,571	$16,340	$75,831	$0	$1,660,742
ESTIMATED CONSTRUCTION COST			**$6,632,426**	**$5,357,733**	**$3,649,976**	**$2,297,449**	**$17,937,584**
Construction Contingency			$663,243	$535,773	$364,997	$229,745	$1,793,758
ESTIMATED CONSTRUCTION + CONTINGENCY			**$7,295,669**	**$5,893,506**	**$4,014,973**	**$2,527,194**	**$19,731,342**
Land Acquisition			$0	$0	$10,000	$0	$10,000
Engineering			$1,326,485	$1,071,547	$729,995	$459,489	$3,587,516
Legal and Admin			$165,811	$133,943	$91,249	$57,436	$448,439
Testing			$53,059	$42,862	$29,200	$18,380	$143,501
Non-Construction Cost Subtotal			**$1,545,355**	**$1,248,352**	**$860,444**	**$535,305**	**$4,189,456**

Street	From	To	Estimated Construction Cost				
			Wastewater Eligible	Water Eligible	Storm Eligible	City Cost (Not Eligible)	Total
Interim Interest			$228,099	$184,260	$125,786	$79,012	$617,157
Estimated Total Capital Cost			**$9,069,123**	**$7,326,118**	**$5,001,203**	**$3,141,511**	**$24,537,955**

4.1.3 Alternative Considered – Additional CIPP Lining with Open Cut Sanitary Sewer, Water Distribution System Replacement

4.1.3.1 Description

The additional CIPP lining option calls for full replacement of all sanitary and water mainline pipes and structures within the right-of-way. Additional CIPP lining would be used instead of open cut replacement in some areas. Sanitary service pipes are replaced up to the ROW to address I/I. Storm sewer is replaced, followed by reconstruction of the street base and pavement. Old pipe such as VCP and CIP is replaced with modern materials such as PVC or HDPE. Cross connections between sanitary sewer and storm sewer are corrected, reducing or eliminating inflow of storm water into the sanitary system. One of the primary objectives of the project is to reduce I/I by replacing old, deteriorated sewer mains. In the areas where this work is proposed, the water main is of a similar vintage. Consequently, the water main is proposed to be replaced in these areas as well.

CIPP lining will be utilized to rehabilitate some existing sanitary mainline and service pipes for both alternatives. Service laterals that are lined will be lined to the building to address I/I. The only difference between the two build options is the amount of open cut sanitary replacement compared to CIPP lining. See Figure 8 to view which areas would have CIPP lining and open cut sanitary sewer replacement under this alternative.

Full replacement of water main and services within the project area is proposed for both alternatives. Services will be replaced to the ROW. The existing water distribution system has many areas of old, undersized, CIP water main that are susceptible to breaks. Because of the brittleness of old cast iron, it is advisable to replace it anytime an adjacent utility improvement (such as sanitary sewer) is contemplated. Water services are replaced to the right-of-way line, eliminating the leaks at the existing connections to the main line.

4.1.3.2 Design Criteria

A goal of the project is to bring the sanitary treatment ponds into compliance with MPCA permitting limits by reducing I/I. Based on the televising information and City staff observations, both the sanitary mains and service pipes are sources of I/I. The televising data, including service locations, defects, and observed active infiltration found were reviewed to identify areas for improvements that were most likely to provide a decrease in I/I. The design criteria for the gravity wastewater collection system, as mandated by the MPCA is as presented in the Ten State Standards. These design criteria include minimum sizes and grades for collection mains and spacing of manholes. All replacement sewer mains will be constructed of gasketed, non-corroding, strong, and flexible modern pipe material. Manholes will be precast with integrally cast bottoms and inverts, self-sealing boots, joint gaskets and seals, and external chimney seals. All

service connections will be made using gasketed fittings compatible with the pipe material used. Services will be replaced from the main to the ROW.

For sanitary lining areas, existing pipes are lined in the identical alignment and grade without excavation. A modest improvement in manning's roughness coefficient can be realized with the new solid pipe, but general flow characteristics will not be changed. Sanitary manholes consisting of block, or precast structures in poor structural condition will be spin cast with a cementitious material to provide structural integrity and prevent I/I. In structures where a structural concern is not noted, an epoxy lining will be utilized to seal the structure. In addition, manholes will have either internal or external chimney seals installed to reduce inflow. In cases where the rings are in fair condition, the internal seals will be used. Where the rings require replacement, the external seals will be used. Each manhole will be logged, photographed, and tested for soundness during final design in this alternative.

Improvements to the adjusting rings will be made under two conditions.

- If the rings show wear, deterioration, or active infiltration.
- If the rings are in excess of 1 foot in depth the rings will be replaced with a 12 inch section.

Leaking joints in the manhole will be sealed with a chemical grout to stop active infiltration and prevent future leaking joints. All pipe doghouses will be injection grouted to avoid water "following the pipe" that formerly entered through the joints. Concrete used to grout manhole doghouses in the past is prone to leaking, and seals from the date of this system installation have outlived their design lives.

The design criteria for the water distribution system is as mandated by the MDH and as presented in the Ten State Standards. The design criteria include minimum sizes for distribution mains, and provision and location of valves and hydrants.

The design criteria for the storm drainage system will be based off the MnDOT Drainage Manual which uses a number of factors including, but not limited to, drainage area, land use, roadway design, inlet spacing, and inlet size, to determine number of catch basins and pipe sizes. The City is the owner of the streets within the project area, so although the manual will be used as a guide, in some cases all of the design criteria may not be met or it may be exceeded to ensure enough capacity in flood-prone areas.

4.1.3.3 Map

The map showing proposed utility improvements can be found in Figure 6. Open cut sanitary collection replacement, CIPP lining, water distribution, and storm sewer improvements are shown. Regardless of the alternative, the project impact area is the same.

4.1.3.4 Environmental Impacts

Replacement of portions the existing sanitary, water, and storm sewer systems will involve typical reconstruction methods in an already fully developed urban setting. There are no anticipated impacts to the local floodplains, wetlands, or other important land resources as a consequence of construction. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.1.3.5 Land Requirements

Most proposed storm sewer, sanitary, and water systems are located within public rights of way. The City will obtain a permanent easement for a proposed storm sewer outlet to the lake south of the Lane Avenue and Main Street intersection. The City plans to purchase the lot on the northeast quadrant of Cleveland Street and Lake Avenue for purposes of building the new lift station. The estimated cost to acquire the permanent storm sewer easement is $10,000 and the estimated cost for the proposed lift station lot is $25,000.

4.1.3.6 Potential Construction Problems

No unusual conditions or difficulties are anticipated for the reconstruction of the wastewater, water, or storm sewer systems.

4.1.3.7 Sustainability Considerations

4.1.3.7.1 Water and Energy Efficiency

Reducing I/I in the system will reduce lift/pump station electricity use. Wastewater treatment efficiency will be improved by reducing the clean water treated in the system.

4.1.3.7.2 Green Infrastructure

No green infrastructure considerations are part of this alternative.

4.1.3.7.3 Other

The sanitary collection system proposed is generally the same as the City currently has, except for the proposed pipe material, and is the standard system for most municipalities.

The water distribution system proposed is generally the same as the City currently has and is the standard system for most municipalities. There are no feasible alternatives to this type of system for water distribution.

The storm sewer proposed is generally the same as the City currently has and is the standard system for most municipalities. Installing larger catch basin grates should increase pavement life by capturing a higher rate of flow, reducing the effects of high gutter flows and the time that water is pooled on the pavement.

4.1.3.8 Cost Estimate

Table 4-2 presents estimated construction costs for all of the proposed improvements to the sanitary, water, storm sewer, and street improvements included in this alternative. O&M costs will not change from existing for either alternative since the City operates and maintains similar systems currently. Since O&M remains constant, and non-construction costs are a function of estimated construction costs, alternatives have been evaluated solely on their estimated construction costs. See the Existing Facilities section of this report for existing O&M costs.

Table 4-2 – Estimated Construction Cost for Lining Alternative

Street	From	To	Estimated Construction Cost
LANE AVE	MAIN ST	T.H. 7	$1,477,289
FRANK ST	LANE AVE	LAKE AVE	$2,473,633
CENTER ST	LANE AVE	SUMMIT AVE	$2,541,016

Street	From	To	Estimated Construction Cost
OLIVER AVE	MAIN ST	FRANK ST	$1,038,845
PARK AVE	MAIN ST	T.H. 7	$1,255,587
QUEEN AVE	CENTER ST	FRANK ST	$336,331
RICE AVE	CENTER ST	FRANK ST	$296,636
SUMMIT AVE	CENTER ST	FRANK ST	$393,962
CLEVELAND AVE	TOWER ST	EAST ST	$2,451,037
TOWER ST	CLEVELAND AVE	MAIN ST	$409,618
LAKE AVE	MERRILL ST	MAIN ST	$1,145,511
MERRILL AVE & EAST OF GROVE	LAKE ST	GROVE AVE	$785,444
CENTER ST/NE EAST AVE/ FRANK ST	GROVE AVE	GROVE AVE	$1,039,097
C R. 92	W OF GROVE ST	W OF CENTURY AVE	$1,590,892
SANITARY SEWER EXTENSTION	& LINING	AREAS	$1,430,751
TOTAL ESTIMATED CONSTRUCTION COST			$18,665,649

4.2 Drinking Water Treatment

When considering alternatives the goal is to categorize them as feasible or infeasible. The options detailed below for the water treatment system were considered for this Preliminary Engineering Report to make improvements on specific areas of the water system. The feasible alternatives were carried through to the selection of an alternative phase.

4.2.1 Alternative Considered – Regionalization

Another option for Silver Lake's water supply system is regionalization. The nearest regionalization option to the City of Silver Lake would be the City of Hutchinson, which is almost 10 miles apart. For this reason, regionalization is not a feasible option that should be considered.

4.2.2 Rehabilitate Existing Wells and New Raw Water Main

4.2.2.1 Description

Well 2 is the City's primary well as Well 1 has declined in capacity over the years. Under this alternative, the wells will be rehabilitated to increase functionality and longevity. This work would start with a complete inspection of each of the well shafts, and be cleaned and rehabilitated accordingly. In addition to the well shaft, both wells will need the pumps, motors, and process pumping replaced to account for changes in the system.

Also included would be construction of new raw water main from Well 2 to Well 1 for future storage and/or treatment.

4.2.2.2 Design Criteria

Well 1 and Well 2 are supplied by 10 inch casing at a depth of 182 feet and 210 feet, respectively. Both wells are metered by 4-inch flow meters. Based on the age and decrease in capacity available over the years, it is anticipated that the Well 1 rehabilitation will include cleaning the shaft, replacement of the casing, well screen, pump, motor, and process piping. Well 2 is the City's primary well and has had regular maintenance over the years. It is anticipated that the Well 2 rehabilitation will include cleaning the shaft, and replacement of the pump, motor, and process piping.

Included in this work will be the construction of raw water main from Well 2 to Well 1. The raw water main will allow for the wells to be treated at one central location. The water main will need to cut north up Tower Ave and then head east down Main St W to the parking lot east of the Community Center. The length of water main required will be approximately 700 feet.

4.2.2.3 Map

The raw water main upgrades to the existing water system can be found in Figure 15.

4.2.2.4 Environmental Impacts

Construction of new water main and the well rehabilitation will involve typical reconstruction methods in an already fully developed urban setting. There are no anticipated impacts to the local floodplains, wetlands, or other important land resources as a consequence of construction.

4.2.2.5 Land Requirements

The proposed water systems are located on City property or within public right-of-way. No additional land is required for this option. If needed, temporary easements will be obtained to allow construction access.

4.2.2.6 Potential Construction Problems

No unusual conditions or difficulties are anticipated for the construction of the water systems.

4.2.2.7 Sustainability Considerations

4.2.2.7.1 Water and Energy Efficiency

Modern energy-efficient pumps will be included in the well rehabilitation.

4.2.2.7.2 Green Infrastructure

Green infrastructure is not applicable.

4.2.2.8 Cost Estimates

The No Additional Treatment alternative would not have additional construction costs. However, this could be a costly alternative, if chosen, to continue operating and maintaining the aging system prior to regionalization.

Table 4-3 presents estimated construction costs for all of the proposed improvements to the well rehabilitation as well as the water main construction. O&M costs will not change from existing for either alternative since the City operates and maintains similar systems currently. Since O&M

remains constant, and non-construction costs are a function of estimated construction costs, alternatives have been evaluated solely on their estimated construction costs. Table 4-4 presents estimated capital cost for the well rehabilitation and water main construction.

Table 4-3 – Well Rehabilitation and Raw Water Main Construction Costs

Item	Estimated Cost
Well 1 Rehabilitation	$150,000
Well 2 Rehabilitation	$120,000
Raw Water Main	$105,000
Construction Contingency	$93,750
Estimated Total Construction Cost	**$468,750**

Source: Opinion of Probable Cost

Table 4-4 – Well Rehabilitation and Raw Water Main Non-Construction Costs

Item	Estimated Cost
Engineering	$67,500
Legal & Admin	$9,400
Materials Testing	$3,000
Interim Interest	$14,160
Estimated Total Non-Construction Cost	**$94,060**

Source: Opinion of Probable Cost

4.2.3 Alternative Considered – No Well Rehabilitation

Under this alternative, both wells will be operating as they currently are with Well 2 as the primary well and Well 1 will be an emergency well. The operator cannot get replacement parts for the Well 1 pump, motor, and meter anymore, so it is anticipated that the Well 1 will likely need to be replaced in the near future. For this reason, regionalization is not a feasible option that should be considered.

4.2.4 Alternative Considered – No Additional Treatment

4.2.4.1 Description

Under this alternative, the existing source and chemical addition system would remain in place, as is. The City of Silver Lake does not currently have a water treatment facility. The current system's only source of treatment is chlorine, fluoride and corrosion inhibitors that are fed into the system at Well No. 2 prior to distribution. The City of Silver Lake's water quality for both wells exceed the Secondary Drinking Water Standards for iron and manganese and have high levels of ammonia. In addition, Silver Lake's average manganese levels have exceeded the United States Environmental Protection Agency (US EPA) Health Based Value (HBV) of 0.10 mg/L. This value is protective of bottle-fed infants less than one year of age, the most sensitive population, as well as other populations consumed in high quantities.

To provide aesthetically pleasing as it relates to iron, as well as provide safe drinking water to the residents as it relates to manganese, implementing a full-scale treatment train of the pilot study is recommended. This option to not construct a new water treatment plant is not recommended.

4.2.4.2 Design Criteria

There is no design criteria associated with the No Additional Treatment option.

4.2.4.3 Map

The existing water system would remain the same as that shown in Figure 2.

4.2.4.4 Environmental Impacts

There would be no environmental impacts associated with the No Additional Treatment option, as the existing system would not change.

4.2.4.5 Land Requirements

There are no land requirements associated with the No Additional Treatment option.

4.2.4.6 Potential Construction Problems

The No Additional Treatment alternative would not involve construction, so there are no potential construction problems.

4.2.4.7 Sustainability Considerations

No additional equipment would be required until failure, which is sustainable from a material standpoint. However, this option is not sustainable from a water supply reliability standpoint. Until a redundant well is constructed, the City will need to run the existing well pumping equipment to failure or take the entire water system offline.

4.2.4.8 Cost Estimates

The No Additional Treatment alternative would not have additional construction costs. However, this could be a costly alternative, if chosen, to continue operating and maintaining the aging system prior to regionalization.

4.2.5 Alternative Considered – Regionalization

Another option for Silver Lake's water supply system is regionalization. The nearest regionalization option to the City of Silver Lake would be the City of Hutchinson, which is almost 10 miles apart. For this reason, regionalization is not a feasible option that should be considered.

4.2.6 Alternative Considered – Construction of New Treatment Facility

4.2.6.1 Description

The City of Silver Lake does not currently have a water treatment facility. The current system's only source of treatment is chlorine, fluoride and corrosion inhibitors that are fed into the system at Well No. 2 prior to distribution. The City of Silver Lake's water quality for both wells exceed the Secondary Drinking Water Standards for iron and manganese and have high levels of ammonia. In addition, Silver Lake's average manganese levels have exceeded the United States Environmental Protection Agency (US EPA) Health Based Value (HBV) of 0.10 mg/L. This value

is protective of bottle-fed infants less than one year of age, the most sensitive population, as well as other populations consumed in high quantities.

The City of Silver Lake does not have a water treatment facility. In 2006, a pilot study was conducted to assess the effectiveness of various treatment processes for the removal of dissolved iron and manganese, which is above Secondary Drinking Water Standards in the City's water supply. The levels of both can be reduced to levels well below the secondary standards by normal oxidation and filtration on granular media. The pilot study recommended that the City of Silver Lake should add a permanganate and filtration WTP, to reduce the iron and manganese levels and ensure problem-free water for their consumers. The pilot study is included in this report as Appendix 7.

Viable alternatives to be evaluated for water treatment include:

- Gravity filtration WTP
- Pressure filtration WTP

4.2.6.2 Design Criteria

The design of the WTP is based on the reduction of iron and manganese to below secondary standards of 0.30 mg/L and 0.05 mg/L, respectively. However, the presence of ammonia in water limits the amount of chemicals and methods that may be used in oxidize the minerals in the water. The typical treatment process used to remove dissolved iron and manganese include chemical oxidation with aeration, chlorine addition of potassium permanganate ($KMnO_4$), followed by filtration through specifically prepared filter media designed for effective iron and manganese removal. The 2006 pilot study optimized these treatment techniques with the City of Silver Lake's primary source water from Well No. 2.

The pilot study compared the effectiveness of several common water filtration media and determined that a greensand/anthracite media performance was superior over silica sand/anthracite media. It is anticipated that greensand/anthracite media will be the most effective media for full-scale filtration and removal of iron and manganese from water pumped. It was recommended that a filtration rate of 2-gpm/ft^2 be used to allow the WTP a higher loading rate for a short period of time during summer pumping or emergencies.

The pilot study also tested the effectiveness aeration followed by a 30-minute detention. Based on the results observed, the use of detention for the effective oxidation and removal of dissolved iron and manganese is not needed. Anticipated oxidation chemical costs will be marginally higher without detention, but it is not believed that this incremental treatment operational cost warrants the construction of a detention tank. Dissolved iron and manganese should be effectively oxidized with the use of permanganate as the preferred oxidant. Aeration may also be implanted for increased iron oxidation.

At the time of the Pilot Study, ammonia removal was not as much of a concern as it is today. To account for the elevated levels in ammonia in the City's raw water, the pilot study altered the dose of permanganate, to oxidize contaminants, as well as reduce the level of free chlorine in the filter effluent. This means that the disinfection in the distribution system will be mostly completed by chloramines rather than free chlorine as the free chlorine will react with the available ammonia almost instantly.

It is expected that the WTP will still follow the recommendations laid out by the Pilot Study Report and remove the iron and manganese from the City's water by adding potassium permanganate

and utilizing aeration, detention, and filtration, along with adding chlorine for disinfection, fluoride to prevent tooth decay, and a corrosion inhibitor. The Pilot Study Report also concluded to effectively remove iron and manganese in the source water tested, filters can be designed as pressure filters or as gravity filters, without significant differences in treatment operation costs.

The monthly and average daily water use for the City of Silver Lake is 75,000 gallons per day (GPD) with a recorded maximum volume of 126,000 gallons in 2010. Using a 20% increase in maximum day demand as a design factor, the design capacity of the WTP should be 150,000 GPD in 20 hours of runtime, which would be 180,000 GPD capacity (125 gpm). The raw water wells can deliver 260 to 275 gpm. After being rebuilt, Well 1 will operate as the primary for the WTP, Well 2 would provide redundancy to the supply. The firm capacity between the two wells is 260 gpm or 374,400 GPD to the proposed WTP, which is more than adequate pumping capacity to meet demands.

The proposed water treatment plant would not include a backup generator. It is anticipated that a backup generator would be included with the potential pumping station for the ground storage tank options. If the City decides to go with the new elevated water tower alternative, a generator should be added to the WTP.

The dimensions of the facility will vary slightly based on the two proposed filtration alternatives: gravity vs. pressure filtration plant. The overall treatment is the same for either option shown in the treatment process flow diagram below. The main difference is that a gravity filtration system requires high service pumps after the filters to pump to the distribution system and water storage tank. High service pumps are not required in a pressure filtration system because the well pumps push the water through the process units to the water tower and distribution system. A backwash tank is not anticipated to be necessary for this design.

4.2.6.3 Map

Proposed layouts of the pressure and gravity filtration WTPs are provided in Figures 10 and 11. The location of the WTP is north of the City's historic Community Center.

4.2.6.4 Environmental Impacts

Any work done to the WTP would be done within City owned property. Special care would need to be given when working around or with the existing water supply well to ensure that no adverse effects to the groundwater, local floodplains, wetlands or other important land resources are encountered with the construction of a new gravity or pressure filter water treatment facility. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.2.6.5 Land Requirements

The proposed site of the WTP is on the existing Well No. 2 site owned by the City. No additional land would be required to construct the WTP. This site is central to the City, which will assist in ease of maintenance, supply, and security. It is anticipated that a portion of the parking lot to the east would need to be demolished, in order to construct the WTP.

4.2.6.6 Potential Construction Problems

No construction problems are anticipated. The site provides enough room for construction and due to its location allows the City to easily connect into the existing water system infrastructure. Special care will need to be given on the south side of the building in order to not disturb the existing historic auditorium.

4.2.6.7 Sustainability Considerations

4.2.6.7.1 Water and Energy Efficiency

Modern energy-efficient pumps will be included in the WTP design.

4.2.6.7.2 Green Infrastructure

Green infrastructure is not applicable.

4.2.6.8 Cost Estimates

Tables 4-5 and 4-6 presents estimated capital cost for the water treatment plant alternatives (gravity filtration, pressure filtration). Estimated O&M costs are shown in Table 4-7. Existing O&M for years 2017–2019 is summarized in Table 2-13 in the Financial Status of Existing Utilities section. A detailed breakdown of existing O&M is listed in Appendix 6. A more detailed breakdown of the associated costs is provided in Appendix 18.

Table 4-5 – New WTP Construction Costs

Item	Estimated Cost	
	Gravity Filter WTP	Pressure Filter WTP
Construction Cost	$1,927,850	$1,755,100
Construction Contingency	$192,790	$175,510
Estimated Total Construction Cost	**$2,120,640**	**$1,930,610**

Source: Opinion of Probably Costs

Table 4-6 – New WTP Non-Construction Costs

Item	Estimated Cost	
	Gravity Filter WTP	Pressure Filter WTP
Engineering	$385,570	$351,020
Legal & Admin	$48,196	$43,878
Materials Testing	$15,423	$14,041
Interim Interest	$66,302	$60,360
Estimated Total Non-Construction Cost	**$515,500**	**$469,299**

Source: Opinion of Probable Cost

Table 4-7 – Annual O&M for New WTP Options

Category	Description	Annual Amount	
		Gravity Filter WTP	Pressure Filter WTP
Staff	Salary, Benefits, etc.	$2,000	$2,000
Supplies	Office, Tools, Minor Equip, etc.	$2,000	$2,000
Professional Services	PeopleService, Consultants	$35,000	$35,000
Training		$100	$100
Insurance		$500	$500
Utilities	Electric, Gas	$5,000	$3,500

Repairs/Maintenance		$1,500	$1,500
Other		$1,000	$1,000
Total Annual O&M		**$47,100**	**$45,600**

Notes: O&M was calculated based on the expected expenses for operating a water treatment plant of this size and does not include other existing expenses within the water system (i.e. well pump(s), water storage, existing chemical feed, etc.).

4.3 Water Storage

4.3.1 Alternative Considered – Rehab Existing Water Tower & New Underground Water Storage

4.3.1.1 Description

The existing water tower was built in 1916 and has been the main source of water storage for the City in over 100 years. Throughout that time, the tower has been well maintained and hasn't proved to be a major pain point for the City. However, with a capacity of 60,000 gallons, the tower is not meeting the minimum storage standards according to 10 States Standards, and has likely surpassed its useful lifespan. If this tower were rehabilitated to operational standards, the system would still require additional storage elsewhere.

In order to satisfy the City of Silver Lake's water demand capacity needs of a minimum of 85,000 gallons, supplemental storage will be required. It has been suggested that a below grade storage tank be assessed for this option. Below grade storage tank would allow for the City to increase their capacity, without adding any visual obstructions to the skyline.

4.3.1.2 Design Criteria

To ensure the structural integrity and ensure sustainable water quality, the existing water tower should be extensively rehabilitated. This would include a complete inspection report, structural modifications, full-containment, removal and replacement of all interior and exterior coatings.

As for the below grade storage, it is proposed that the City of Silver Lake should design the underground water storage with a total storage capacity of 75,000 gallons made of concrete. This will satisfy the City of Silver Lake's water demand capacity needs of 135,000 gallons. In order to supply water from below grade, a pump station would be required. The pump station would be designed to supply the City with water from three differently sized pumps: a small jockey pump would run on a continuous cycle to pressurize the distribution system, a service pump to supply water to the system, and a high service pump to achieve desired fire flow capabilities. The pumps would be constructed at grade and would pull water from the below grade tank. The pump station will require the use of standby generator with automatic transfer switch.

To allow for above grade overflow, the tank will need to be at least a few feet above grade. It is proposed that the tank will have a concrete slab top, with backfill and seed over it to create a more visually appealing surface elevation.

4.3.1.3 Map

Figure 12 presents the location of the proposed underground water storage tank. The proposed site will utilize the north side of Well No. 2 site. The site would be sufficient to allow for the construction and maintenance of a water storage facilities. Additionally, it is desired, per long range planning, to potentially place a water treatment facility in the south portion of the site alongside the Well No. 2 pump house.

4.3.1.4 Environmental Impacts

Both the existing water tower and the proposed underground storage tank are adjacent to a municipal well, special consideration will need to be given to not to compromise the well. Due to age of the water tower and the potential presence of heavy metals, and to avoid fugitive dust emissions and paint drift, a full-containment structure will be constructed as part of the recoating replacement project. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.3.1.5 Land Requirements

The proposed site of the new 75,000-gallon underground storage tank is on the existing Well No. 2 site owned by the City. No additional land would be required. In order to ensure setbacks from neighboring buildings, the curb and gutter of the parking lot to the east will need to be extended and the parking lot reconfigured accordingly.

No additional land is need to for the water tower improvements.

4.3.1.6 Potential Construction Problems

Based on the age of the existing water tower, heavy metals may be present in the existing paint coatings. If any lead/chromium-based paints are discovered, the project must adjust accordingly to ensure no environmental impacts.

4.3.1.7 Sustainability Considerations

4.3.1.7.1 Water and Energy Efficiency

There is a possibility of increased water and energy efficiency by upgrading the existing water to today's standards. However, it is still an old structure that would not work as proficiently as a new structure.

4.3.1.7.2 Green Infrastructure

No consideration for green infrastructure is included.

4.3.1.8 Cost Estimates

Refer to Tables 4-8 and 4-9 for the breakdown of the construction and non-construction costs for rehabilitation of the existing 60,000-gallon water tower and construction of a new underground 75,000 gallon water storage tank. It should be noted that if any lead/chromium-based paints are discovered, the cost to rehabilitate could increase by 15%–25%. A more detailed breakdown of the associated costs is provided in Appendix 9.

Table 4-8 -- Rehab Existing Tower & New Underground Water Storage Construction Costs

Item	Estimated Cost
Water Tower Rehab - Construction Cost	$394,000
Underground Storage - Construction Cost	$1,080,700
Construction Contingency	$147,470
Estimated Total Construction Cost	**$1,622,170**

Source: Opinion of Probable Cost

Table 4-9 – Rehab Existing Tower & New Underground Water Storage Non-Construction Costs

Item	Estimated Cost
Engineering	$265,500
Legal & Admin	$36,900
Materials Testing	$11,800
Interim Interest	$50,000
Estimated Total Non-Construction Cost	**$364,200**

Source: Opinion of Probable Cost

4.3.1.9 Annual O&M

The annual O&M aren't expected to change with the rehabilitation of the existing elevated water tower, but it is anticipated that there will be additional costs associated with the addition of the underground storage tank and a pump station. Table 4-10 breaks down the projected O&M costs in further detail. Existing O&M for years 2017–2019 is summarized in Table 2-13 in the Financial Status of Existing Utilities section. A detailed breakdown of existing O&M is listed in Appendix 6.

Table 4-10 – Annual O&M for Rehabilitation Rehab Existing Tower & New Underground Water Storage

Category	Description	Annual Amount
Staff	Salary, Benefits, etc.	$11,000
Supplies	Office, Tools, Minor Equip, etc.	$10,000
Professional Services	PeopleService, Consultants	$30,000
Training		$700
Telephone		$600
Insurance		$1,200
Utilities	Electric, Gas	$8,500
Repairs/Maintenance		$12,000
Other		$7,000
Total Annual O&M		**$81,000**

Category	Description	Annual Amount
Notes: O&M was estimated using existing expenses supplied by the City and expected increases or decreases in expenses with the proposed alternative. Includes the complete existing water expenses within the water system.		

4.3.2 Alternative Considered – New Elevated Water Tower

4.3.2.1 Description

The existing water tower tank does not provide adequate storage for the City. The addition of a new elevated storage tank to the water system would provide the City with adequate storage necessary for existing and future demands. Furthermore, a water tower would not increase the skill required to operate the water system when compared to the existing system.

As part of this project, the existing water tower will be decommissioned and disconnected from the system. The existing tower will remain in its' current condition as a historic property as identified by SHPO.

4.3.2.2 Design Criteria

Cities need to have enough storage to meet fluctuations of domestic water demand and provide enough storage for fire protection. A general guideline is for a City to have storage of one and a half to two times the average daily water use. With the relatively low demands, it is important to correctly size any water storage system to prevent high water age and freezing caused by inadequate turnover of a tank.

The monthly and average daily water use for the City of Silver Lake is 68,000 gallons per day (GPD) with a recorded maximum volume of 126,000 gallons in 2010. It is proposed that the City of Silver Lake should design a water tower with a total storage capacity of 150,000 gallons.

The elevated storage tank would be designed to maintain a hydraulic grade line (HGL) similar to the maximum provided by the existing water tower. The existing HGL provides adequate pressure for the City of 58 psi to 60 psi throughout the system. The amount of pressure available to a water system is directly proportional to the height of a water tower. To maintain existing pressures, the proposed water tower will be designed at the same elevation as the existing water tower.

The water tower style being proposed is a single pedestal style tank; however, the City may be inclined in the design process to pursue another legged tank like the existing. In general, single pedestal water towers have generally less long-term operation and maintenance costs than legged tanks.

A mixing system will be provided in the water tower to prevent freezing in the winter and thermal stratification of the water during the summer. Thermal stratification of water can lead to water quality issues and increased water age. The proposed towers will each have the same coating systems applied, which will be designed for a minimum of a 20-year life.

This alternative does not require the use of standby generation at the water tower site.

4.3.2.3 Map

Figure 13 presents the location of the proposed water tower. The proposed site will utilize the north side of Well No. 2 site. This site has a very similar ground elevation as the existing water tower, which will aid in reducing the height of the proposed water tower. The site would be sufficient to allow for the construction and maintenance of a water tower or other storage facility. Additionally, it is desired per long range planning to potentially place a water treatment facility in the south portion of the site alongside the Well No. 2 pump house.

4.3.2.4 Environmental Impacts

If the construction of the proposed water tower will be adjacent to a municipal well, special consideration will need to be given to not to compromise the well. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.3.2.5 Land Requirements

The proposed site of the new 135,000-gallon water tower is on the existing Well No. 2 site owned by the City. No additional land would be required to construct the WTP. In order to ensure setbacks from neighboring buildings, the curb and gutter of the parking lot to the east will need to be extended and the parking lot reconfigured.

4.3.2.6 Potential Construction Problems

During the construction of the storage tank, the existing storage can stay online until the new storage is completed, at which point, the existing water tower will be decommissioned and disconnected from the system. The existing tower will remain in its' current condition as a historic property as identified by SHPO and should be present any construction problems.

4.3.2.7 Sustainability Considerations

4.3.2.7.1 Water and Energy Efficiency

This alternative would allow the well pump to operate for extended periods of time to fill a larger volume within the storage tank and would reduce pump starts and stops. The system would be designed for a hydraulic grade better suited for operating a pump at its optimum efficiency point.

4.3.2.7.2 Green Infrastructure

No consideration for green infrastructure is included in this alternative.

4.3.2.8 Cost Estimates

Refer to Tables 4-11 and 4-12 for the breakdown of the construction and non-construction costs for a new pedestal water tower to be constructed at Well No. 2 Site. A more detailed breakdown of the associated costs is provided in Appendix 10.

Table 4-11 – New Elevated Water Tower Construction Costs

Item	Estimated Cost
Construction Cost	$1,154,700
Construction Contingency	$115,470
Estimated Total Construction Cost	**$1,270,170**

Source: Opinion of Probable Cost

Table 4-12 – New Elevated Water Tower Non-Construction Costs

Item	Estimated Cost
Engineering	$207,846
Legal & Admin	$28,868
Materials Testing	$9,238
Interim Interest	$39,116
Estimated Total Non-Construction Cost	**$285,067**

Source: Opinion of Probable Cost

4.3.2.9 Annual O&M

The annual O&M for the water system aren't expected to change significantly with the construction of a new pedestal water tower. Table 4-13 breaks down the projected O&M costs in further detail. Existing O&M for years 2017–2019 is summarized in Table 2-13 in the Financial Status of Existing Utilities section. A detailed breakdown of existing O&M is listed in Appendix 6.

Table 4-13 – Annual O&M for New Elevated Water Tower

Category	Description	Annual Amount
Staff	Salary, Benefits, etc.	$9,000
Supplies	Office, Tools, Minor Equip, etc.	$10,000
Professional Services	PeopleService, Consultants	$28,000
Training		$700
Telephone		$600
Insurance		$1,200
Utilities	Electric, Gas	$6,000
Repairs/Maintenance		$10,000
Other		$7,000
Total Annual O&M		**$72,500**

Notes: O&M was estimated using existing expenses supplied by the City and expected increases or decreases in expenses with the proposed alternative. Includes the complete existing water expenses within the water system.

4.3.3 Alternative Considered – New Standpipe & Pump Station

4.3.3.1 Description

The City does not have adequate storage for existing demands with the current water tower. The addition of a new standpipe and small constant-pressure pumping station could be used to provide water storage and pressure as an alternative to a water tower. The standpipe would be designed to provide the City with adequate storage necessary for existing and future demands.

However, this option will require the construction of a pumping station, which may increase the skill required to operate the water system when compared to the existing system.

As part of this project, the existing water tower will be decommissioned and disconnected from the system. The existing tower will remain in its current condition as a historic property as identified by SHPO.

4.3.3.2 Design Criteria

Development of a water storage tank will meet all of the expressed goals for water storage mentioned earlier of two times the average day demand (150,000 gallon). The standpipe storage tank would be designed such that existing pressures would be maintained in the distribution system. To do this, the pump station would supply the City with water from three differently sized pumps: a small jockey pump would run on a continuous cycle to pressurize the distribution system, a service pump to supply water to the system and a high service pump to achieve desired fire flow capabilities. The standpipe would serve as the water supply for the pump station, which would be provided with a pressure/surge relief system to prevent the distribution system from over pressuring. The pump station will require the use of standby generator with automatic transfer switch.

The ground storage tank style being proposed is a taller standpipe style tank, rather than shorter and wider design that is typical. Standpipes are greater in height than diameter and can be designed with decorative elements to help blend the tank into the surrounding environment. Their taller design allows water above the operating range to assist the high service pumps with gravity-fed pressure. The water below the operating range provides reserve storage. The approximate size of the tank being proposed is 20 feet wide by 60 feet tall and would be constructed of factory-coated bolted carbon steel.

4.3.3.3 Map

Figure 13 presents the location of the proposed water tower. The proposed site will utilize the north side of Well No. 2 site. The site would be sufficient to allow for the construction and maintenance of a water storage facilities. Additionally, it is desired per long range planning, to potentially place a water treatment facility in the south portion of the site alongside the Well No. 2 pump house.

4.3.3.4 Environmental Impacts

If the construction of the proposed water tower will be adjacent to a municipal well, special consideration will need to be given to not to compromise the well. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.3.3.5 Land Requirements

The proposed site of the new 135,000-gallon water tower is on the existing Well No. 2 site owned by the City. No additional land would be required to construct the WTP. In order to ensure setbacks from neighboring buildings, the curb and gutter of the parking lot to the east will need to be extended and the parking lot reconfigured.

4.3.3.6 Potential Construction Problems

During the construction of the storage tank, the existing storage can stay online until the new storage is completed, at which point, the existing water tower will be decommissioned and

disconnected from the system. The existing tower will remain in its current condition as a historic property as identified by SHPO and should not present any construction problems.

4.3.3.7 Sustainability Considerations

4.3.3.7.1 Water and Energy Efficiency

The pump station pumps in this alternative will be provided with variable frequency drives (VFDs) to conserve energy. The pumps would only be run at the speed required to maintain a specific pressure in the distribution system. However, this alternative adds additional pumps to the water system that aren't required for the other water storage alternatives and would likely cause increased energy consumption.

4.3.3.7.2 Green Infrastructure

No consideration for green infrastructure is included in this alternative.

4.3.3.8 Cost Estimates

Refer to Tables 4-14 and 4-15 for the breakdown of the construction and non-construction costs for a new standpipe and pump station to be constructed at Well No. 2 Site. A more detailed breakdown of the associated costs is provided in Appendix 11.

Table 4-14 – New Above Ground Storage Tank & Pump Station Construction Costs

Item	Estimated Cost
Construction Cost	$1,053,700
Construction Contingency	$105,370
Estimated Total Construction Cost	**$1,159,070**

Source: Opinion of Probable Cost

Table 4-15 – New Above Ground Storage Tank & Pump Station Non-Construction Costs

Item	Estimated Cost
Engineering	$189,666
Legal & Admin	$26,343
Materials Testing	$8,430
Interim Interest	$35,695
Estimated Total Non-Construction Cost	**$260,133**

Source: Opinion of Probable Cost

4.3.3.9 Annual O&M

The annual O&M for the water system aren't expected to change significantly with the construction of a new above grade ground storage tank, but it is anticipated that there will be additional costs associated with the addition of the pump station. Table 4-16 breaks down the projected O&M costs in further detail. Existing O&M for years 2017–2019 is summarized in Table 2-13 in the Financial Status of Existing Utilities section. A detailed breakdown of existing O&M is listed in Appendix 6.

Table 4-16 – Annual O&M for New Above Ground Storage Tank & Pump Station

Category	Description	Annual Amount
Staff	$10,000	$10,000
Supplies	$10,000	$10,000
Professional Services	$30,000	$30,000
Training	$700	$700
Telephone	$600	$600
Insurance	$1,200	$1,200
Utilities	$8,000	$8,000
Repairs/Maintenance	$11,000	$11,000
Existing Water Tower Maintenance		$1,000
Other	$1,000	$7,000
Total Annual O&M		**$79,500**
Notes: O&M was estimated using existing expenses supplied by the City and expected increases or decreases in expenses with the proposed alternative. Includes the complete existing water expenses within the water system.		

4.4 Wastewater

4.4.1 Alternative Considered – Wastewater Stabilization Pond and Lift Stations

4.4.1.1 Description

4.4.1.1.1 Wastewater Stabilization Pond

Two alternatives were considered for this project. The first alternative is to not improve the system and leave as is. This approach is not feasible as it does not address I/I issues or the new phosphorus limit.

I/I has overloaded the stabilization ponds. As described in this report, it is recommended that the City complete a large sanitary sewer lining and replacement project in order to correct I/I issues. The identified project is aimed at correcting issues such that the flow to the ponds is less than 80% of the design flow. The project also addresses the new phosphorus limit (see Appendix 12 for MPCA phosphorus limit letter). It is recommended that the pond capacity be revaluated after the completion of the sanitary sewer project. If the ponds are still under capacity at that time, the City should undergo a Phase II project that would involve pond expansion.

As developed in pervious sections, many of the controls structures at the ponds are original and are in poor condition or are inoperable. Improvements or complete replacement to all pond systems that are in poor condition is vital to the success of the WWTF to continue to function properly and avoid operational failures in the future, which could lead to bypasses. Items in need of replacement include the primary pond splitter box, transfer structure, three outlet structures, and both the primary and secondary pond control structures. In addition, 900 linear feet of influent piping (10 inch pipe) needs to be replaced due to age.

4.4.1.1.2 Lift Stations

The alternative improvement for lift stations is total replacement, which is cost prohibitive and unnecessary as both the Main and Century lift stations are in good condition. Replacing components on an as needed basis cost effectively provides the necessary updates.

The Main lift station is in good condition with exception to the pumps. The pumps cannot meet the design flow and need to be replaced. The lift station is also in need of new air release valves, a generator, additional site lighting, wet well vent, meter manhole, plug valves, and a valve vault hatch. All these items are vital to the continued operation of the plant and the prevention of future bypass events.

The Cleveland lift station has surpassed its useful life and needs to be replaced. Without replacement, the City will continue maintenance and possible overflow issues at this station which could also lead to basement backups.

4.4.1.2 Design Criteria

The proposed upgrades are based off of the condition of existing equipment, comments and observations from WWTF staff, and the flow and load data and calculations from 2016 to 2019. The qualitative analysis of the condition of existing equipment was developed in pervious sections of this report. A summary of the flow and load calculations is provided in this report and in Appendix 13.

It is assumed that there will be a significant decrease in I/I due to collection system improvements. This assumption allows for a more economical design for the improvements to the lift stations and ponds.

The variability in phosphorus levels in recent years is of concern and needs to be addressed. The simplest method of phosphorous removal is the addition of alum to the primary ponds. This addition requires the addition of a duck boat, motor, ramps, and a storage shed for boat, equipment, and chemical storage.

The Main Lift Station is currently designed to pump 520 gpm with one pump running and up to 620 gpm with two pumps running. The new pumps need to be designed to meet up to 620 gpm at 44 TDH in order to meet the design flow and pump through the existing 8-inch force main. The interion of the new system is to adequately pump the design flow, as all extraneous flow from I/I is projected to be eliminated as part of prior improvements.

The new Cleveland Lift Station is designed to pump up to 400 gpm, determined by the service area demand and the size of the force main (8 inches). The old lift station is undersized, and as the current location of the lift station does not accommodate expansion, the new lift station must be relocated. As the existing station will no longer be used, it needs to be completely removed and the site restored. The new lift station will consist of the following: basket screen, crane, wet well, valve vault, check valves, plug valves, vent pipes, pumps (2), generator, metering manhole, site lighting, fencing and gate, and a new 8-inch sanitary sewer force main to connect the Cleveland Lift Station to the Main Lift Station. There is currently no flow measurement at the Cleveland Lift Station. A new flowmeter and meter manhole would provide operators with more information to monitor the status and efficiency of the lift station. Fencing and gate protection are recommended to protect the site from public access and interference.

The ponds have visible sludge accumulation which needs to be removed. Sludge sampling in the primary ponds was performed in the summer of 2020. See Appendix 15 for a copy of the sludge sampling results and original pond plan drawing. A detailed description of the solids buildup in each pond is provided in Section 2.3.3.2.2-3.

4.4.1.3 Map

The locations of the lift stations are presented in Figure 3 and the wastewater stabilization pond map is presented in Appendix 1.

4.4.1.4 Environmental Impacts

Regularly overloading the wastewater system and permitting high phosphorus levels negatively impacts the environment. The capacity of the wastewater system must be improved to avoid overloads. Environmental impacts are reviewed in the companion Environmental Report (ER).

4.4.1.5 Land Requirements

The Cleveland lift station requires a full replacement and a new force main. As the current location does not allow for expansion, the new lift station is proposed to be constructed across the street at the northeast corner of Lake Avenue and Cleveland Street.

4.4.1.6 Potential Construction Problems

No construction problems are projected for this project.

4.4.1.7 Sustainability Considerations

4.4.1.7.1 Water and Energy Efficiency

The proposed project will improve water and energy efficiency by reducing the I/I in the system. Updates will help reduce electricity use on downstream lift stations as pumps will run less often. The system efficiency will improve by reducing the clean water treated in the system.

4.4.1.7.2 Green Infrastructure

Green infrastructure is not relevant for this project.

4.4.1.8 Cost Estimates

The cost estimate for the proposed wastewater improvements is shown in Table 4-17 below. A detailed construction cost estimate is shown in Appendix 14.

Table 4-17 – Proposed Wastewater Construction Costs

Item	Estimated Cost
Cleveland Lift Station	$418,498
Main Lift Station	$238,500
Pond Improvements	$687,500
Estimated Total Construction Cost	**$1,344,498**

The cost estimate for the Cleveland Lift Station assumes that the roads will already be opened up for street reconstruction, thus road deconstruction and reconstruction costs are not included. The

land acquisition cost is a preliminary estimate based on the current value of the land and anticipated inflation. The final cost will be dependent on negotiations between the City and the property owner.

5 Selection of an Alternative

5.1 Sanitary Collection, Water Distribution, and Storm Sewer

The do-nothing alternative is not feasible. It simply delays necessary improvements, which will lead to rising maintenance costs on an increasingly unreliable system. The MPCA will require the wastewater treatment to comply with permit requirements, and the do-nothing alternative would allow I/I to continue at levels that exceed permitted flows.

5.1.1 Life Cycle Cost Analysis

Comparing the open-cut option with the additional CIPP lining option is done using a traditional life cycle analysis. Neither alternative for the sewer improvements result in a change in O&M costs, so a uniform series present worth calculation would be the same for each option. Similarly, there are not any short-lived assets for sanitary distribution pipes, water main, services, storm sewer or structures. None of these items have salvage value either. For this project, the net present value is simply equal to the estimated construction costs.

Given the simplified net present value calculation, the recommended alternative is determined by lower estimated construction costs. The open-cut construction estimate is $17,937,584, and the CIPP lining option estimate is $18,665,649. The full open-cut option is the lower-cost option and is the recommended alternative.

5.1.2 Non-Monetary Factors

There were no non-monetary factors considered.

5.2 Water Treatment Plant

To aid in the selection of the best solutions for the City of Silver Lake, each of the alternatives deemed feasible in the preceding sections of the report are compared here on two principal criteria; 1) A present value analysis of capital costs, O&M, and the cost of short-lived assets, and 2) Non-monetary consideration. For purposes of the present value analysis, the following factors are used:

- Real Federal Discount Rate (per OMB Circular A-94): 0.3%
- Planning Period (years): 20
- Planning Period Uniform Series Present Worth Factor: 19.384
- Planning Period Single Payment Present Worth Factor: 0.9419

5.2.1 Life Cycle Cost Analysis

A life cycle cost analysis was completed for both WTP alternatives. The least costly option, Do Nothing, is not feasible as it does not address the City's needs. Regionalizing is not feasible. It is recommended that the City proceed with the New WTP alternative.

Table 5-1 presents the present worth of the pressure filtration WTP versus gravity filtration WTP based on a 20-year life cycle.

Table 5-1 – Drinking Water Treatment Options Source Life Cycle Costs

Item	Quantity/Amount	
	Gravity Filter WTP	Pressure Filter WTP
Planning Period (In Years)	20	20
Expected/ Useful Life of System (In Years)	50	50
Real Discount Rate	0.30%	0.30%
Salvage Value (SV)	$1,272,384	$1,155,366
Total Capital Costs	$2,636,140	$2,399,909
Annual Operations & Maintenance (O&M)*	$47,100	$45,600
Single Present Payment Worth Factor	0.941849127	0.941849127
Single Payment Present Worth (SPPW) of SV	$1,198,394	$1,091,006
Uniform Series Present Worth Factor	19.38	19.38
Uniform Series Present Worth of O&M	$912,969	$883,893
Net Present Value	**$2,350,715**	**$2,192,795**
*Depreciation is assumed to be straight line depreciation based on expected useful life of system.		

5.2.2 Non-Monetary Factors

Construction of a new WTP has the greatest potential to provide safe and aesthetically pleasing water to the City between the treatment alternatives. The 2006 Pilot Study (see Appendix 7) determined that the quality of water produced is high in iron and manganese. The proposed treatment process consisting of aeration and filtration (gravity or pressure filtration) are very effective at removing the level of iron and manganese present in the Silver Lake water supply.

The proposed location for the new water treatment plant is adjacent to the existing Well No. 2, allowing to City easily connect to the existing infrastructure. The proposed site is part of the parcel of land Owned by the City that also houses the Well No. 2 pump house. No additional land will need to be purchased or easements required to construct the new facility. However, the proposed water treatment facility will be behind a historic building. Refer to the environmental report for impacts.

The two WTP option being compared are gravity and pressure filtration. The biggest difference is between and open and closed system. Unlike the gravity plant, which allows for easy visual inspection, the pressure filtration system is a closed system, which means that all of the openings from the well to distribution are gasketed shut. The operator cannot visually inspect the media in the filter to confirm proper backwashing of media without a considerable effort. This also means visual of inspection of the interior coatings, troughs, weirs, spray nozzles etc. is limited to an annual inspection at best. However, the one advantage of the system is that a high service pump is not needed to pump filter effluent to the water tower or distribution system.

5.3 Water Storage

5.3.1 Life Cycle Cost Analysis

A life cycle cost analysis was completed for the water storage alternatives. Cost wise, the new elevated storage tank coincidentally is the simplest to operate, and also requires the least increase in operation and maintenance costs.

Table 5-2 presents the present worth of the water storage alternatives versus pressure filtration WTP based on a 20-year life cycle.

Table 5-2 – Water Storage Options Source Life Cycle Costs

Item	Quantity/Amount		
	Water Tower	Standpipe & Pump Station	Rehab and New GST
Planning Period (In Years)	20	20	20
Expected/ Useful Life of System (In Years)	75	60	50
Real Discount Rate	0.30%	0.30%	0.30%
Salvage Value (SV)	$931,458	$772,713	$973,302
Total Capital Costs	$1,555,237	$1,419,203	$1,986,370
Annual Operations & Maintenance (O&M)*	$72,500	$79,500	$81,000
Single Present Payment Worth Factor	0.941849127	0.941849127	0.941849127
Single Payment Present Worth (SPPW) of SV	$877,293	$727,779	$916,704
Uniform Series Present Worth Factor	19.38	19.38	19.38
Uniform Series Present Worth of O&M	$1.405,313	$1,540,998	$1,570,074
Net Present Value	**$2,083,257**	**$2,232,421**	**$2,639,740**

*Depreciation is assumed to be straight line depreciation based on expected useful life of system.

5.3.2 Non-Monetary Factors

The three water storage tank alternatives are elevated water tower, above grade ground storage, and underground storage. Of the three, the elevated water tower is the simplest to operate and does not have the added maintenance of a pump station. Of the two ground storage tank options, the above grade ground storage tank would be the simplest to maintain. Staff can visually inspect the entire tank at a lower elevation than the water tower. The below grade storage tank alternative would require a dive team to conduct any inspections to the tank.

The proposed location for the new water storage tank would be constructed adjacent to the existing Well No. 2, allowing to City easily connect to the existing water main. The proposed site is part of the parcel of land Owned by the City that also houses the Well No. 2 pump house. No additional land will need to be purchased or easements required to construct the new storage option. However, the proposed water storage tank will be behind a historic building and will fall under certain restriction Refer to the environmental report for impacts.

The proposed projects will be on the same site that is already owned by the City of Silver Lake and can be constructed to anticipate the other. For the storage tank, the existing storage can stay

online until the new storage is completed, at which point, depending on the project selection, can be rehabilitated, demolished, or left in-place.

5.4 Wastewater

The only feasible alternative to address the I/I issues and new phosphorus limit is to undergo selective updates to both the ponds and lift stations, which is described in the following section.

5.4.1 Life Cycle Cost Analysis

The O&M costs are not expected to change significantly as a result of this project. The sewer O&M cost for 2017, 2018, and 2019 were $141,577, $115,759, and $150,110 (see Table 2-13 in the Financial Status of Existing Utilities section). Inflation should be considered when predicting future O&M budgets. A small reduction in electricity costs can be expected due to increased efficiency of the new pumps.

No items from the lift station or pond improvements can be salvaged.

With no change to O&M and no salvage value, construction cost is the only remaining factor in the Life Cycle Cost Analysis. The cost of installation is summarized in Table 4-15 in the Alternatives Considered section of the report. A detailed cost estimated is shown in Appendix 14.

5.4.2 Non-Monetary Factors

Updating the wastewater infrastructure will economically benefit the City by avoiding fines and increasing system efficiency. Allowing system backups at the lift stations and force mains to continue by not improving the system can cause costly and undesirable backups in the City sewers and neighborhoods.

6 Proposed Project/Recommended Alternative

6.1 Preliminary Project Design

6.1.1 Sanitary Collection, Water Distribution, and Storm Sewer

Sanitary sewer mains will be replaced in-kind via open-cut construction in the same general alignment. It is anticipated that the contractor will install PVC SDR-35 pipe, but HDPE and ductile iron would also be acceptable. Sanitary sewer manholes will be replaced with new precast reinforced concrete manholes with external manhole seals. Services will be replaced with either 4 inch or 6 inch plastic pipe with a wye connection from the main up to the ROW.

Water main will be replaced in-kind via open-cut construction in the same general alignment.

Gate valves will be installed at the intersections and at connections to existing water main to allow pressure testing limits. Water services will be replaced from the main with a saddle connection and either copper or plastic pipe and connected to the existing service with a curb stop and box at the edge of the property right-of-way.

The design criteria for the storm drainage system will be based off the MnDOT Drainage Manual which uses a number a factors including, but not limited to, drainage area, land use, roadway design, inlet spacing, and inlet size, to determine number of catch basins and pipe sizes. The City of Silver Lake or McLeod County is the owner of all of the streets in the project area, so

although the manual will be used as a guide, in some cases all of the design criteria may not be met or it may be exceeded to ensure enough capacity in flood-prone areas.

The recommended open cut alternative design is shown on Figure 7.

6.1.2 Water Supply Wells

The two existing raw water supply wells are adequate for the future needs. It is not proposed to change this location or add additional wells. Well #1 should be a priority for rehabilitation, to add redundancy to the system. Due to the age and unavailable parts needed for repair, it is recommended that the Well 1 (i.e., pump, well shaft, process piping, etc.) be completely replaced. The well and pump at Well #2 is currently operating efficiently and will likely need some rehabilitation in the future by the City, however, the process piping within the Well #2 building is in poor condition and should be replaced.

6.1.3 Drinking Water Treatment Facility

Iron and manganese levels in both wells exceed secondary drinking water standards. The recommended alternative for the WTP is to construct a new pressure filtration WTP that will meet primary and secondary drinking water standards. This option is the most acceptable given the City's raw water quality. The recommendations for alternative selections are the following:

- Treatment: The recommended pressure filtration plant would be designed for 125 gpm treatment capacity. The facility would include an aerator, pressure filter(s), and chlorine, fluoride and permanganate feed systems. The process piping would be a closed system, which means that all of the openings from the well to distribution are gasketed shut. The raw water supply wells would pressurize the filters from supply to water storage. Refer to Alternatives Considered and Selection of an Alternative sections for a detailed description. The WTP will produce a quality of drinking water that meets the primary and secondary treatment standards as well as the needed capacity for the future needs.

6.1.4 Water Storage

The recommended alternative for the water storage is to construct a new above-grade ground storage tank and pump station. As detailed in Alternatives Considered and Selection of an Alternative sections, this option will satisfy the existing storage capacity needs. The City selected this option for functionality, aesthetics, and to protect the sightline of the historically protected structures in the City and the existing water tower as described earlier in this report. The recommendations for alternative selections are the following:

- An above ground storage tank will be constructed to provide water storage and consistent pressure within the City. The ground storage tank will be a silo design with a capacity of 150,000 gallons. The storage tank will require a pump station to distribute the water. The cost of a new storage tank and pump station is presented in this PER. The water tower will be protected by a coating system designed to last 20 or more years.
- Existing water tower will be decommissioned (hydraulically disconnected and drained) as part of this project.

6.1.5 Wastewater Stabilization Pond

The phosphorus level in the City exceeds the phosphorus limit established in 2018. Phosphorus in the ponds can be reduced by alum addition to dissociate solids. A boat ramp into all three ponds and a duck boat with motor will ensure effluent limits are met for phosphorus in the future.

Several sections of the ponds are overloaded and need to be dredged and solids land applied or landfilled. Some of the rip rap has eroded away and needs to be replenished. Additional gravel is also needed as driving surface is unsteady surrounding the ponds. A fence and rolling car gate will also be added as the current fence is in poor condition.

6.1.6 Lift Stations

I/I has overloaded the stabilization ponds. While a pond expansion is not feasible, I/I can be significantly reduced by updating the collection system, lift stations, and force mains.

6.1.6.1.1 Cleveland Lift Station

The Cleveland lift station requires a full replacement and a new force main. As the current location does not allow for expansion, the new lift station is proposed to be constructed across the street at the northeast corner of Lake Avenue and Cleveland Street. The current force main will be a total replacement from the new lift station to the intersection of Main Street and Lake Street.

The new pumps for the wet well were sized based on the run time of the current pumps. Pumps sized at 350 to 400 gpm will reduce the risk of backups at this lift station. These pumps will likely run on a 5 to 10 hp motor, which is reduced due to the low system head. Detailed pump sizing will be performed during the design phase.

6.1.6.1.2 Main Lift Station

The Main lift station is in acceptable condition but requires new pumps, a generator, and plumbing upgrades in order to meet flow demands. The lift station has experienced flow backups due to inadequate pump sizing or force main size limitations. The station is designed to pump 520 gpm with one pump, and it can pump up to 620 gpm with two pumps running. However, pump tests indicate the system is only able to achieve 515 gpm with one pump and does not see an increase in capacity with the second pump. There are two options for the new pump design: use an 8 inch force main and size pumps for 550 pgm at 85 ft of TDH, or increase the force main size to 10 inch' and size the pumps at 550 gpm at 44 TDH, a difference of 25 hp pumps to 15 hp pumps, respectively. However, the energy savings by selecting smaller pumps does not offset the cost of replacement of the force main. Therefore, the pumps should be designed for the existing 8 inch' force main. Due to the increase in energy efficiency over the years, it is likely that they newer pumps will use the same size motors as the current pumps.

The lift station also requires a new vent and access hatch to meet current safety standards.

6.1.6.1.3 Century Lift Station

No changes are proposed to the Century lift station.

6.1.7 Project Schedule

Project schedule is shown below in Table 6-1.

Table 6-1 – Proposed Schedule

Milestone	Date
Public Hearing	June 4, 2020
PER/ER Completion: submittal to USDA-RD	October 2020
USDA-RD PER Review (4 months)	October 2020–January 2021
USDA-RD Funding Obligation	February 2021
Preliminary Engineering Design (3 months)	March–May 2021
USDA-RD Engineering Review (2 months)	June–July 2021
Final Engineering Design (5 months)	August-December 2021
USDA-RD Legal Review	January 2022
USDA-RD Legal/Engineering Approval (3 months)	January–March 2022
Bidding	April 2022
Award Project	May 2022
Start Project	May 2022
Substantially Complete Project	October 2023
Final Completion	July 2024

6.1.8 Permit Requirements

- Minnesota Department of Health
- Minnesota Pollution Control Agency – Plan Review
- NPDES Permit
- McLeod County Right-of-Way Permit
- MnDOT Right-of-Way Permit
- USACE Utility Regional General Permit and/or USACE Nationwide Permit
- WCA Utility Exemption and/or WCA Replacement Plan Approval

6.1.9 Sustainability Considerations

6.1.9.1 Water and Energy Efficiency

The proposed project will improve water and energy efficiency by reducing the I/I in the system. Updates will help reduce electricity use on downstream lift stations as pumps will run less often. The system efficiency will improve by reducing the clean water treated in the system.

The proposed water storage and treatment improvements will improve energy efficiency through the use of modern energy-efficient equipment.

6.1.9.2 Green Infrastructure

Green Infrastructure is not applicable to this project.

6.1.9.3 Other

No other sustainability considerations are applicable.

6.1.10 Total Project Cost Estimate (Engineer's Opinion of Probable Cost)

Detailed project cost estimates for water, wastewater and street improvements are included in the appendices. Table 6-2 summarizes the total project costs below.

Table 6-2 – Preferred Alternatives Total Project Cost

Item	Well Rehab	Water Storage Tank & Pump Station	Pressure Filter WTP	Streets, Distribution, Collection and Storm	Wastewater	Totals
Construction Cost	$375,000	$1,053,700	$1,755,100	$17,937,584	$1,344,498	$22,465,882
Construction Contingency	$93,750	$105,370	$175,510	$1,793,758	$134,450	$2,302,838
Estimated Total Construction Cost	**$468,750**	**$1,159,070**	**$1,930,610**	**$19,731,342**	**$1,478,948**	**$24,768,720**
Land Acquisition	$0	$0	$0	$10,000	$25,000	$35,000
Engineering	$67,500	$189,666	$351,020	$3,587,517	$295,790	$4,491,493
Legal and Admin	$9,400	$26,343	$43,878	$448,440	$33,612	$561,672
Testing	$3,000	$8,430	$14,041	$143,501	$10,756	$179,727
Non-Construction Cost Subtotal	**$79,900**	**$224,438**	**$408,938**	**$4,189,457**	**$365,158**	**$5,267,892**
Interim Interest	$14,160	$35,695	$60,360	$617,157	$47,578	$774,949
Estimated Total Capital Cost	**$562,810**	**$1,419,203**	**$2,399,909**	**$24,537,956**	**$1,891,684**	**$30,811,561**

6.1.11 Annual Operating Budget

6.1.11.1 Income

Income is estimated based on the assumed affordability of 1.5% multiplied by the median household income ($44,423 based on U.S. Census Bureau 2006–2010 American Community Survey) for each system for each EDU. This equates to $288,527 per utility using 433 EDU's.

6.1.11.2 Annual O&M Costs

6.1.11.2.1 Water Distribution, Sanitary Collection and Storm Sewer

O&M costs from 2017–2019 are shown in the Financial Status of any Existing Facilities section. Spending on water distribution, sanitary collection, and storm sewer is not expected to change from existing levels. These costs are difficult to separate from other utility O&M costs since similar equipment and personnel are involved for all maintenance. Proposed maintenance costs are worked into the estimates for the water and wastewater sections below. Averaging O&M for years 2017–2019 shows an annual storm sewer O&M cost of $32,913. Assuming proposed facilities begin operation in 2023, 3% inflation applied to $32,913 over 4 years leads to projected storm sewer yearly O&M costs of $37,044.

6.1.11.2.2 Water Storage Tank, Pump Station, and Treatment Plant

Water O&M costs are expected to increase due to the added capabilities of the proposed water treatment system. See table below.

Table 6-3 – Annual O&M for Proposed Water Treatment System

Category	Description	Existing Water O&M				Projected Water O&M		
		2017	2018	2019	Avg.	Pressure WTP	New Standpipe & Pump Station	Totals
Staff	Salary, Benefits, etc.	$12,193	$6,925	$5,955	$8,358	$2,000	$10,000	$12,000.00
Supplies	Office, Tools, Minor Equip, etc.	$937	$2,377	$25,114	$9,476	$2,000	$10,000	$12,000
Professional Services	PeopleService, Consultants	$25,604	$22,045	$27,270	$24,973	$35,000	$30,000	$65,000
Training		$304	$1,084	$511	$633	$100	$700	$800
Telephone		$480	$503	$697	$560	$0	$600	$600
Insurance		$1,035	$1,101	$1,229	$1,122	$500	$1,200	$1,700
Electric/Gas	Electric, Gas	$5,660	$6,558	$3,703	$5,307	$3,500	$8,000	$11,500
Repairs/ Maintenance		$2,865	$19,118	$6,594	$9,526	$1,500	$11,000	$12,500
Depr. Exp Acquired*		*	*	*	*	*	*	*
PERA		($2,626)	($4,888)	$361	($2,384)	**	**	**
Other		$5,271	$7,011	$7,114	$6,465	$1,000	$7,000	$8,000
Total Annual O&M		**$51,724**	**$61,834**	**$78,548**	**$64,035**	**$45,600**	**$78,500**	**$124,100**

Notes:

*The annual depreciation for 2017, 2018, and 2019 was $42,223, $42,347, and $43,113 respectively. The annual depreciation with the suggested changes to the system was not calculated.

**Not enough data to estimate. Assumed value of zero.

6.1.11.2.3 Wastewater

Wastewater O&M costs are not expected to change significantly as a result of this project. The sewer O&M costs for 2017, 2018, and 2019 were $141,577, $115,759, and $150,110 (see Table 2-13 in the Financial Status of Existing Utilities section). Inflation should be considered when predicting future O&M budgets. A small reduction in electricity costs can be expected due to increased efficiency of the new pumps.

Averaging O&M for years 2017–2019 shows an annual wastewater O&M cost of $135,815. Assuming proposed facilities begin operation in 2023, 3% inflation to $135,815 over 4 years leads to projected wastewater yearly O&M costs of $152,861.

6.1.12 Debt Repayments

The City has debt repayments for both water and storm utilities. See debt summary in the table below.

Table 6-4 – Utility Long Term Debt

Year	Water	Sewer	Totals
2020	$35,000	$5,000	$40,000
2021	$35,000	$5,000	$40,000
2022	$35,000	$5,000	$40,000
2023	$35,000	$5,000	$40,000
2024	$35,000	$5,000	$40,000
2025	$35,000	$ -	$35,000
2026	$35,000	$ -	$35,000
2027	$35,000	$ -	$35,000
2028	$35,000	$ -	$35,000

6.1.13 Reserves

6.1.13.1 Short-Lived Assets

The short-lived assets for both the proposed water and sewer systems are located below as Tables 6-5 and 6-6. There are not any short-lived assets for sanitary collection, water distribution, or storm sewer systems.

Table 6-5 – Water Short Lived Assets

Year	Improvement	Quantity	2020 Cost	Unit Cost (3% Inflation)	Total Cost
1-5 Years					
	Storage Tank: Drain, Inspect, Remove Sediment	1	$5,000.00	$5,796	$5,796
	WTP Dehumidifiers	1	$3,500.00	$4,057	$4,057
	Chlorine System Gas Detector Replacement	1	$1,000.00	$1,159	$1,159
	Total Years 1-5				**$11,013**
	Annual Cost Years 1-5				**$2,203**

Year	Improvement	Quantity	2020 Cost	Unit Cost (3% Inflation)	Total Cost
6-10 Years					
	Storage Tank Exterior wash and spot repair coatings	1	$7,500	$10,079	$10,079
	Flow Meter Calibration	2	$500	$672	$1,344
	Water Testing Equipment Replacement	1	$2,500.00	$3,360	$3,360
	Line Tracing Equipment Replacement	1	$3,000.00	$4,032	$4,032
	Total Years 6-10				**$18,815**
	Annual Cost Years 6-10				**$1,881**
11- 15 Years					
	Well Rehab	2	$10,000	$15,580	$31,159
	Water Tank Dive Clean and Repair Coatings	1	$10,000	$15,580	$15,580
	Flow Meter Replacement	2	$4,500	$7,011	$14,022
	Well Controls Replacement	1	$15,000	$23,370	$23,370
	Backwash Pump Repair	1	$10,000.00	$15,580	$15,580
	High Service Pump Repair	2	$10,000	$15,580	$31,159
	Blower Maintenance	1	$7,500.00	$11,685	$11,685
	Air compressor maintenance	1	$2,500	$3,895	$3,895
	Replace Storage Tank Mixer	1	$10,000	$15,580	$15,580
	Water Heater	1	$2,000	$3,116	$3,116
	Pressure filter vessel rehab*	1	$200,000	$311,593	$311,593
	Doors	1	$5,000	$7,790	$7,790
	Fluoride feed system	1	$5,000	$7,790	$7,790
	Sodium permanganate feed system	1	$5,000	$6,720	$6,720
	Chlorine feed system	1	$5,000	$6,720	$6,720
	Total Years 11-15				**$505,757**
	Annual Cost Years 11-15				**$33,717**
				Total Annual Cost	**$37,801**

*Work will include filter media filter media replacement, air wash system maintenance, process piping and valve rehabilitation, sand blasting interior and exterior, and repainting.

Table 6-6 – Wastewater Short Lived Assets

Year	Improvement	Quantity	2020 Cost	Unit Cost (3% Inflation)	Total Cost
1-5 Years					
	No assets with lives less than 5 years			$0	$0
	Total Years 1-5		$ -		**$0**
	Annual Cost Years 1-5		$ -		**$0**

Year	Improvement	Quantity	2020 Cost	Unit Cost (3% Inflation)	Total Cost
6-10 Years					
	No assets with lives less than 5 years			$0	$0
	Total Years 6-10		$ -		**$0**
	Annual Cost Years 6-10		$ -		**$0**
11- 15 Years					
	Century Lift Station Pumps	2	$15,000	$23,370	$46,739
	Century Lift Station Control Panel	1	$25,000	$38,949	$38,949
	Total Years 11-15				**$85,688**
	Annual Cost Years 11-15				**$5,713**
				Total Annual Cost	**$5,713**

7 Conclusions and Recommendations

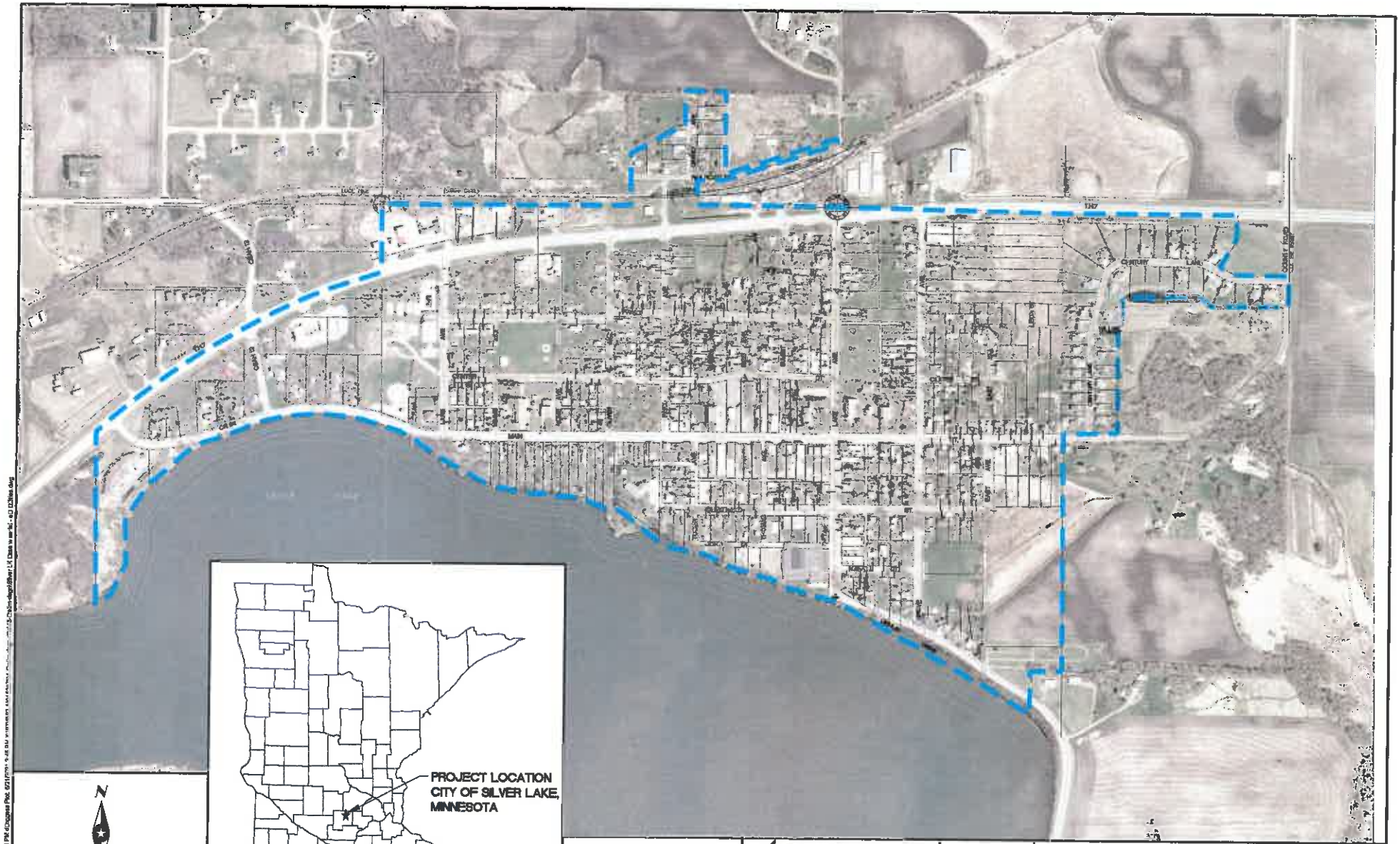
The City of Silver Lake needs improvements to the sanitary collection and treatment system. Flows beyond permitted levels are occurring due to excessive I/I in the collection system, and the stabilization pond requires improvements and maintenance to continue operations. A combination of sanitary replacement and lining of the main lines and service lines is recommended to reduce the I/I. Lift stations with unreliable equipment will be upgraded or replaced.

The existing water tower is over 100 years old and is near the end of its useful life. A new water storage standpipe and pump station is proposed to replace the City's existing water storage. There is not any treatment for the current drinking water, and the City has frequent complaints about the taste, odor and texture of the drinking water. A water treatment plant is proposed to improve the water quality and give the City flexibility to address future treatment needs.

Existing cast iron water distribution pipes adjacent to sanitary construction will be replaced. Storm sewer structures and pipes will be replaced and sized to modern standards, which will reduce the risk of damage due to localized flooding.

jb

Figures



SEH
PHONE: 800.325.9566
1360 HWY 15 S.
SUITE 200, PO BOX 308
HUTCHINSON, MN 55350
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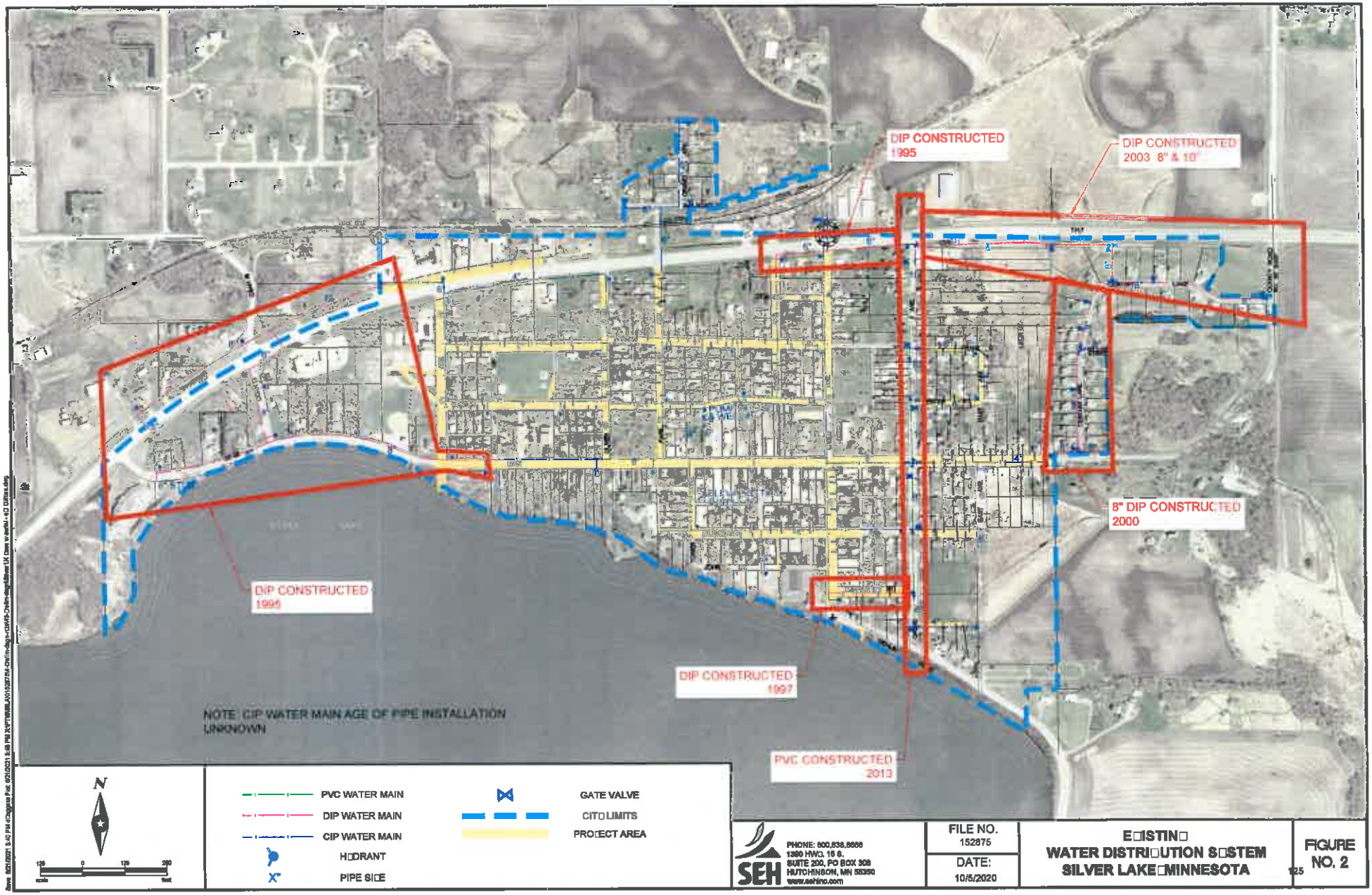
FILE NO.	LOCATION MAP	FIGURE
152675	SILVER LAKE, MINNESOTA	NO. 1
DATE: 10/5/2020		



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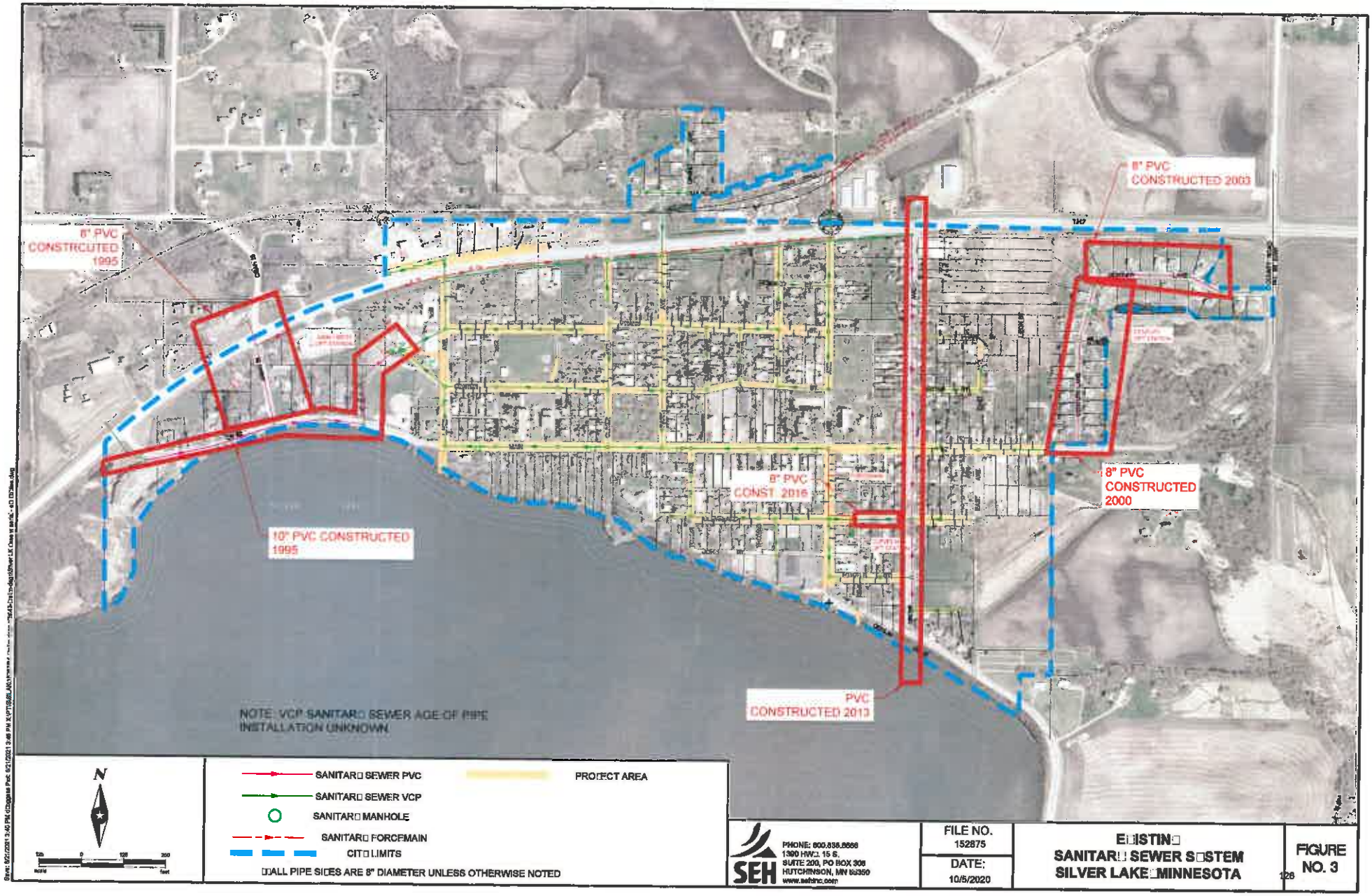
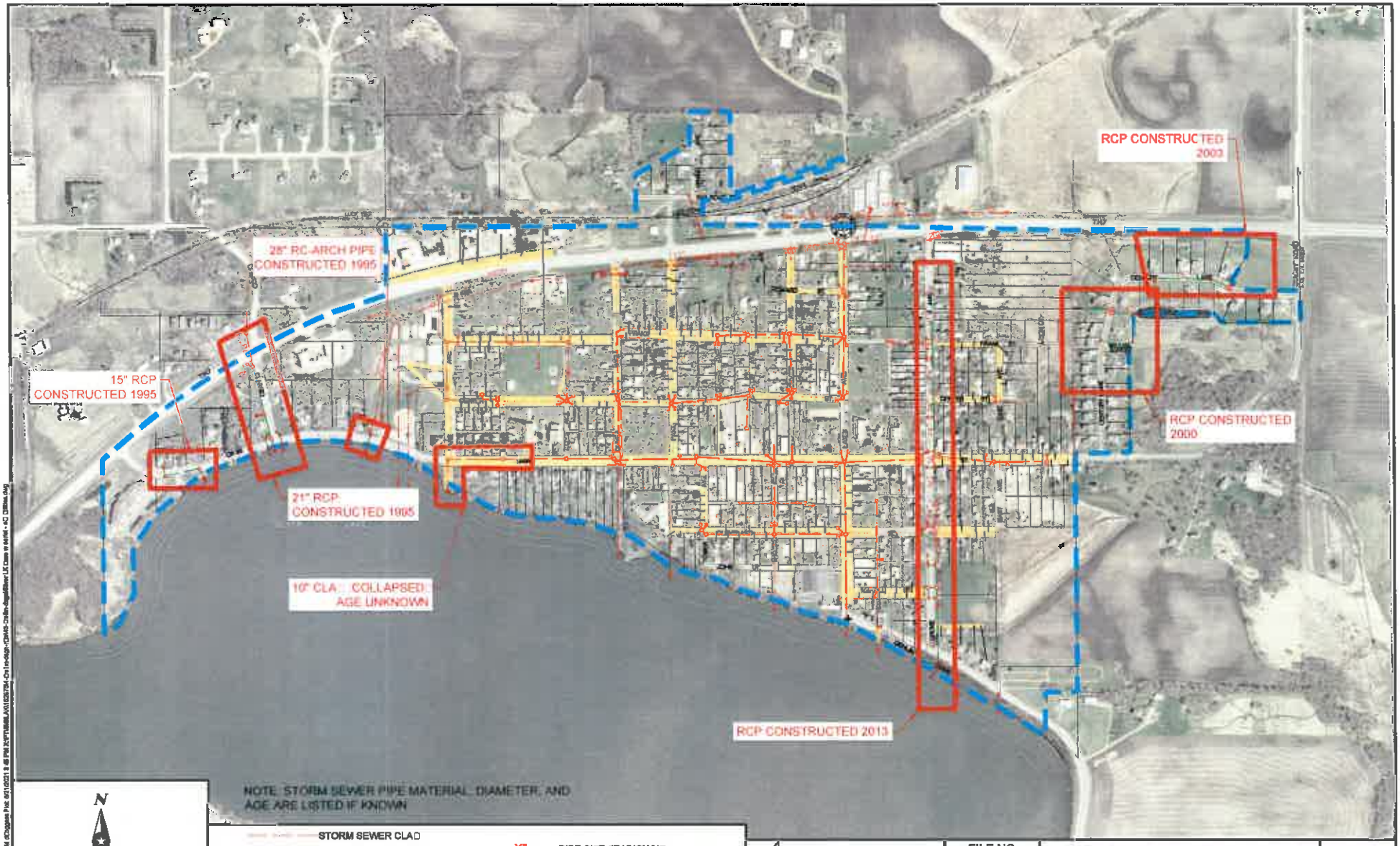
FILE NO. 152875

DATE: 10/5/2020

EXISTING WATER DISTRIBUTION SYSTEM SILVER LAKE, MINNESOTA

FIGURE NO. 2


8" PVC CONSTRUCTED 1995
8" PVC CONSTRUCTED 2003
8" PVC CONST 2016
8" PVC CONSTRUCTED 2000
10" PVC CONSTRUCTED 1995
PVC CONSTRUCTED 2013
NOTE: VCP SANITARY SEWER AGE OF PIPE INSTALLATION UNKNOWN
N
SANITARY SEWER PVC
SANITARY SEWER VCP
SANITARY MANHOLE
SANITARY FORCEMAIN
CITY LIMITS
ALL PIPE SIDES ARE 8" DIAMETER UNLESS OTHERWISE NOTED
PROJECT AREA
SEH
PHONE: 800.836.8666
1300 HWY 15 S.
SUITE 209, PO BOX 308
HUTCHINSON, MN 55350
www.sehinc.com
FILE NO. 152875
DATE: 10/5/2020
EXISTING SANITARY SEWER SYSTEM
SILVER LAKE, MINNESOTA
FIGURE NO. 3


RCP CONSTRUCTED 2003
28" RC-ARCH PIPE CONSTRUCTED 1995
15" RCP CONSTRUCTED 1995
21" RCP CONSTRUCTED 1995
10" CLAY COLLAPSED AGE UNKNOWN
RCP CONSTRUCTED 2000
RCP CONSTRUCTED 2013
NOTE: STORM SEWER PIPE MATERIAL, DIAMETER, AND AGE ARE LISTED IF KNOWN
N
STORM SEWER CLAY
STORM SEWER RCP
STORM MANHOLE
STORM CATCH BASIN
X"
PIPE SIZE (IF KNOWN)
STORM OUTLET APRON
CITY LIMITS
PROJECT AREA
SEH
PHONE: 800.325.2055
1360 HWY. 15 S.
SUITE 200, PO BOX 306
HUTCHINSON, MN 55350
www.sehinc.com
FILE NO. 152875
DATE: 10/5/2020
EXISTING
STORM SEWER SYSTEM
SILVER LAKE, MINNESOTA
FIGURE NO. 4


N
PROPOSED 6" WATER MAIN
EXISTING WATER MAIN
PROPOSED HYDRANT
CITY LIMITS
SEH
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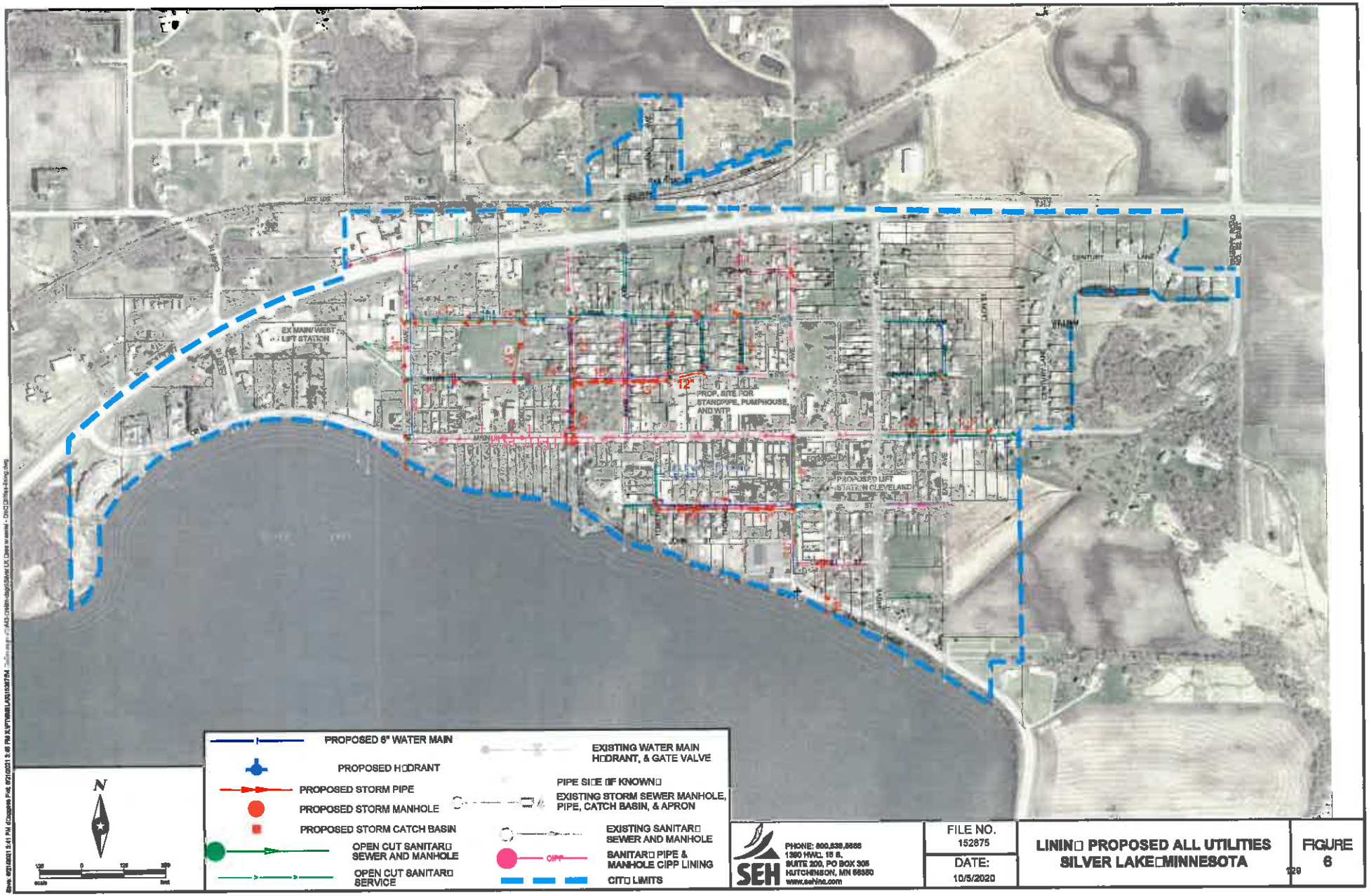
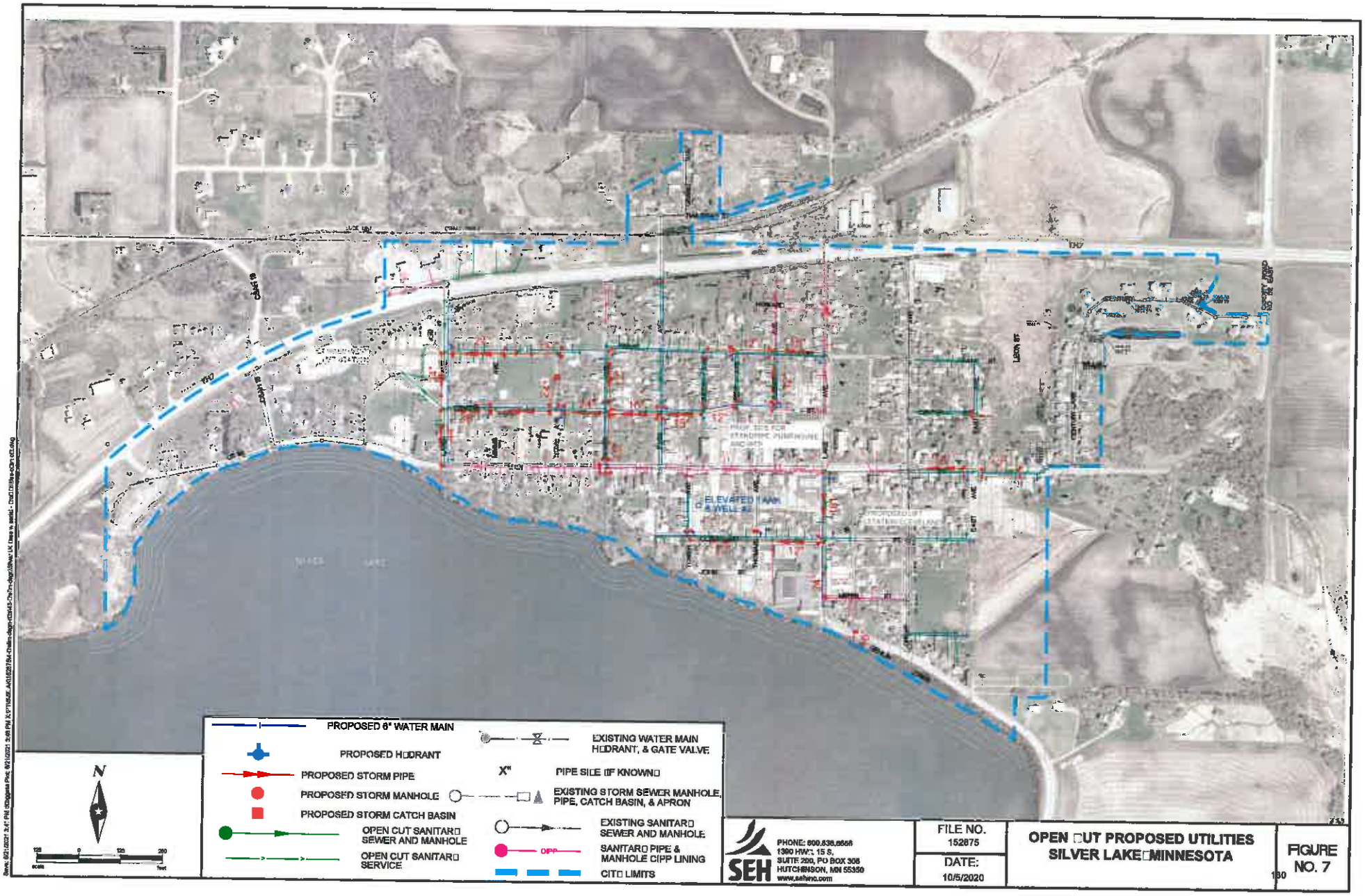
1300 HWY. 15 S.
SUITE 200, PO BOX 308
HUTCHINSON, MN 55350
www.sehinc.com
FILE NO.
152875
DATE:
10/5/2020
OPEN CUT ALTERNATIVE
WATER DISTRICUTION SYSTEM
SILVER LAKE, MINNESOTA
FIGURE
NO. 5


EX MAIN WEST LIFT STATION
PROP. SITE FOR STANDPIPE, PUMPHOUSE, AND WTP
PROPOSED LIFT STATION CLEVELAND ST
PROPOSED 6" WATER MAIN
PROPOSED HYDRANT
PROPOSED STORM PIPE
PROPOSED STORM MANHOLE
PROPOSED STORM CATCH BASIN
OPEN CUT SANITARY SEWER AND MANHOLE
OPEN CUT SANITARY SERVICE
EXISTING WATER MAIN HYDRANT, & GATE VALVE
PIPE SIZE (IF KNOWN)
EXISTING STORM SEWER MANHOLE, PIPE, CATCH BASIN, & APRON
EXISTING SANITARY SEWER AND MANHOLE
SANITARY PIPE & MANHOLE CIPP LINING
CITY LIMITS
CIPP
N
SEH
PHONE: 800.535.5566
1360 HWY. 15 S.
SUITE 200, PO BOX 305
HUTCHINSON, MN 55350
www.sehinc.com
FILE NO. 152875
DATE: 10/5/2020
LINING PROPOSED ALL UTILITIES
SILVER LAKE, MINNESOTA
FIGURE 6



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HUTCHINSON, MN 55350
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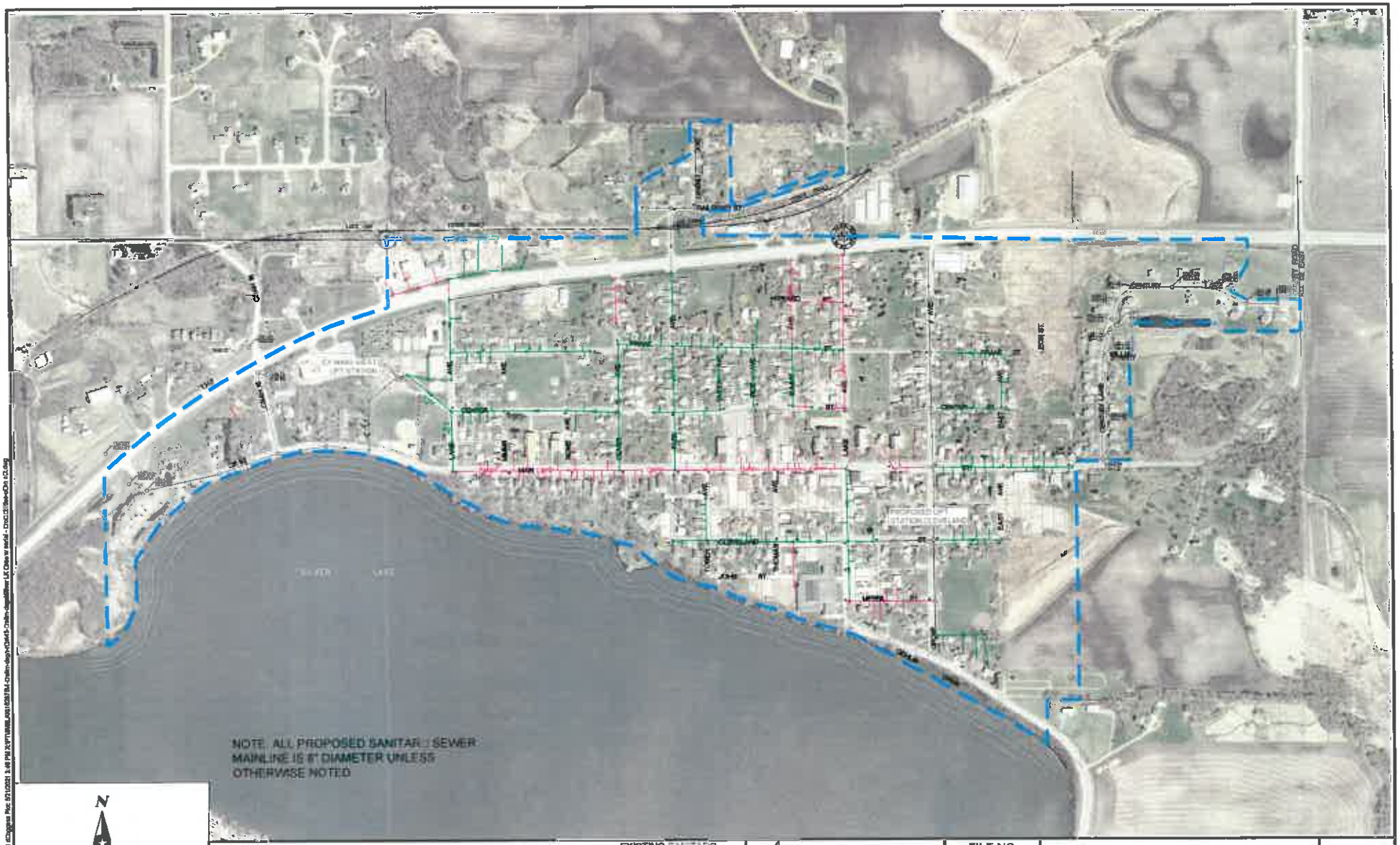
FILE NO. 152875

DATE: 10/5/2020

OPEN CUT PROPOSED UTILITIES
SILVER LAKE, MINNESOTA

FIGURE NO. 7


NOTE: ALL PROPOSED SANITARY SEWER MAINLINE IS 8" DIAMETER UNLESS OTHERWISE NOTED
N
OPEN CUT SANITARY SEWER AND MANHOLE
OPEN CUT SANITARY SERVICE
EXISTING SANITARY SEWER AND MANHOLE
CIPP
SANITARY PIPE & MANHOLE CIPP LINING
CITY LIMITS
SEH
PHONE: 800.535.5055
1360 HWY 15 S,
SUITE 200, PO BOX 308
HUTCHINSON, MN 55350
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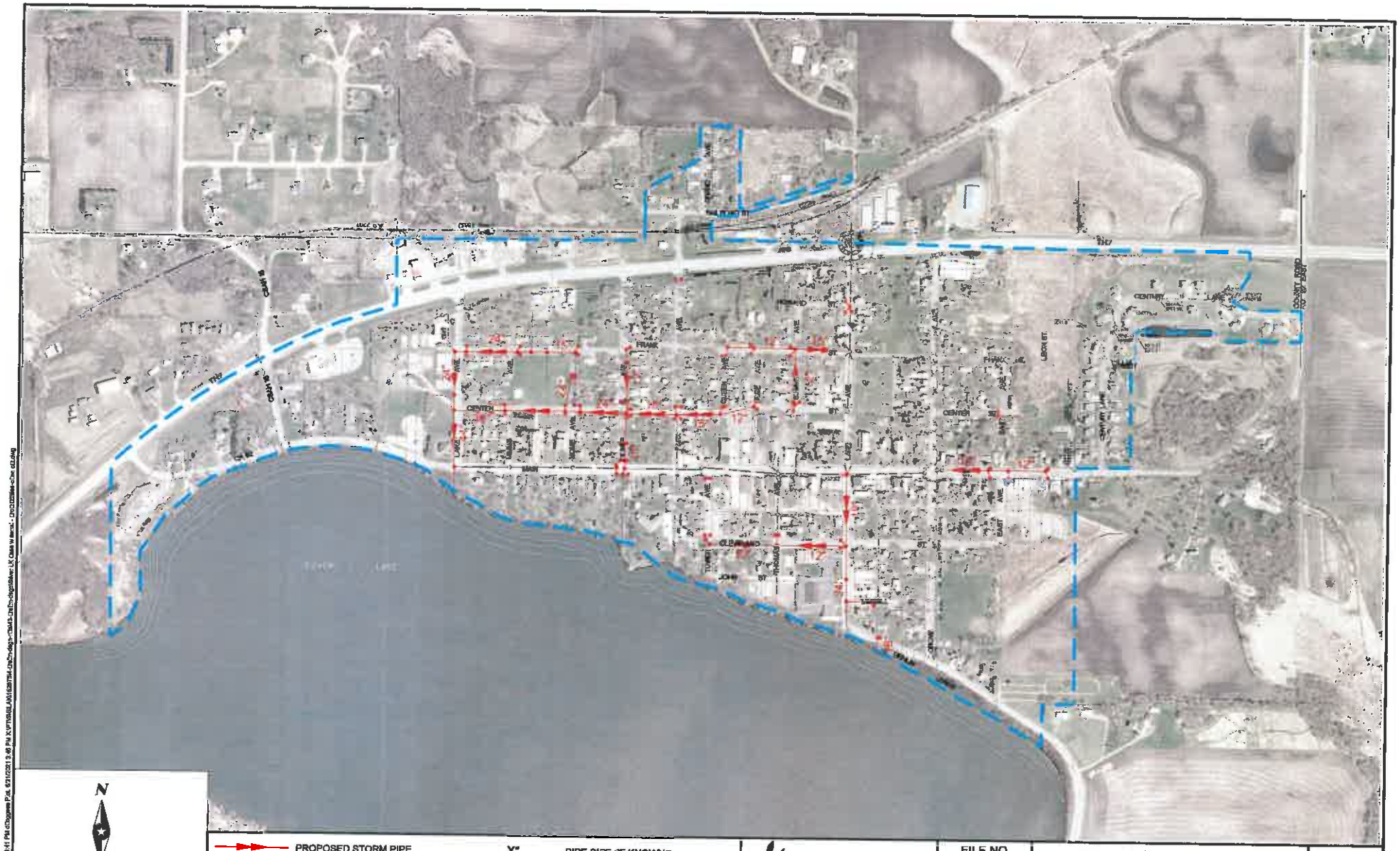
FILE NO.
152875
DATE:
10/5/2020
OPEN CUT ALTERNATIVE
SANITARY SEWER SYSTEM
SILVER LAKE, MINNESOTA
FIGURE
NO. 8



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1360 HWY 15 S.
SUITE 200, PO BOX 308
HUTCHINSON, MN 55350
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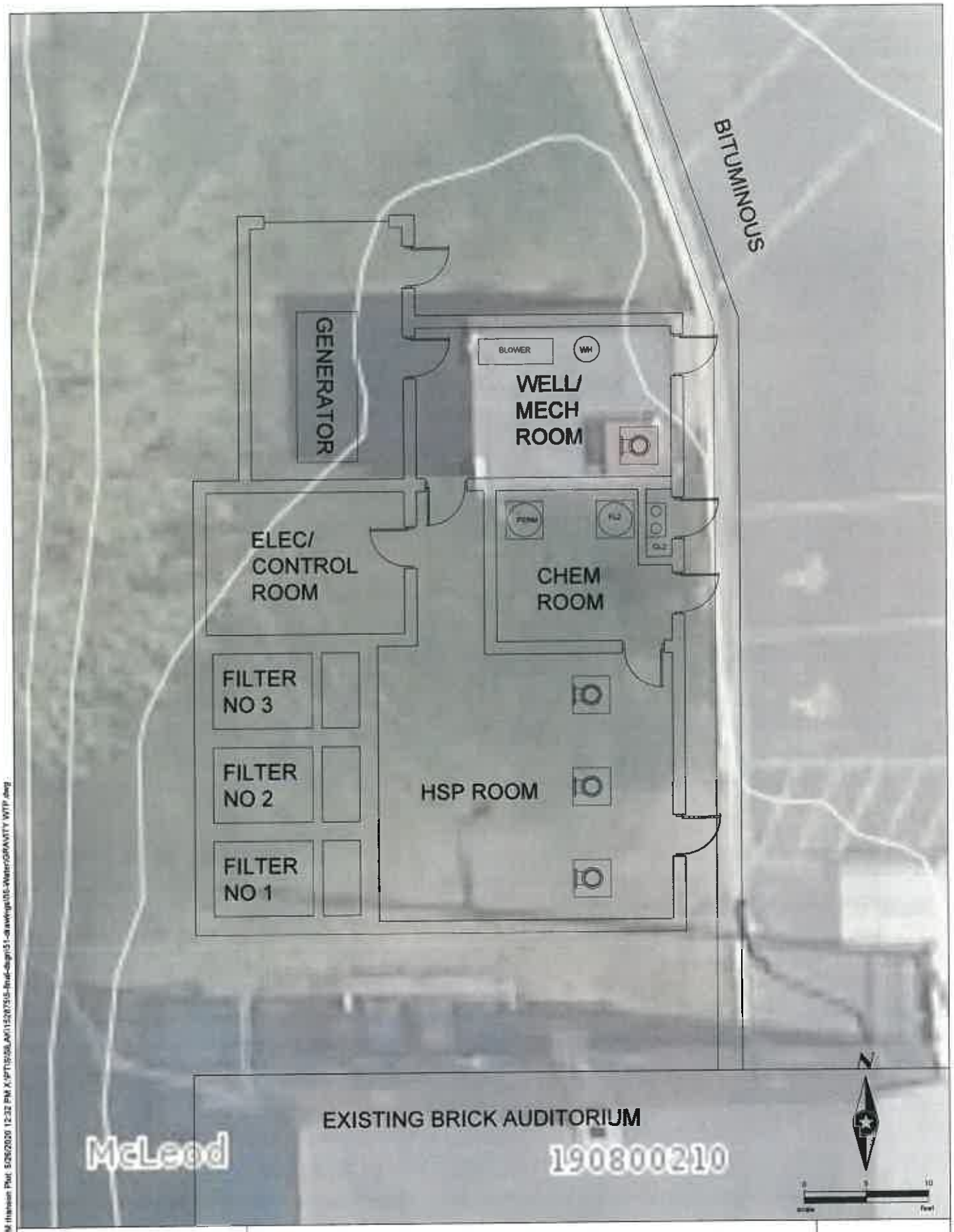
FILE NO. 152875

DATE: 10/5/2020

OPEN CUT ALTERNATIVE STORM SEWER SYSTEM SILVER LAKE, MINNESOTA

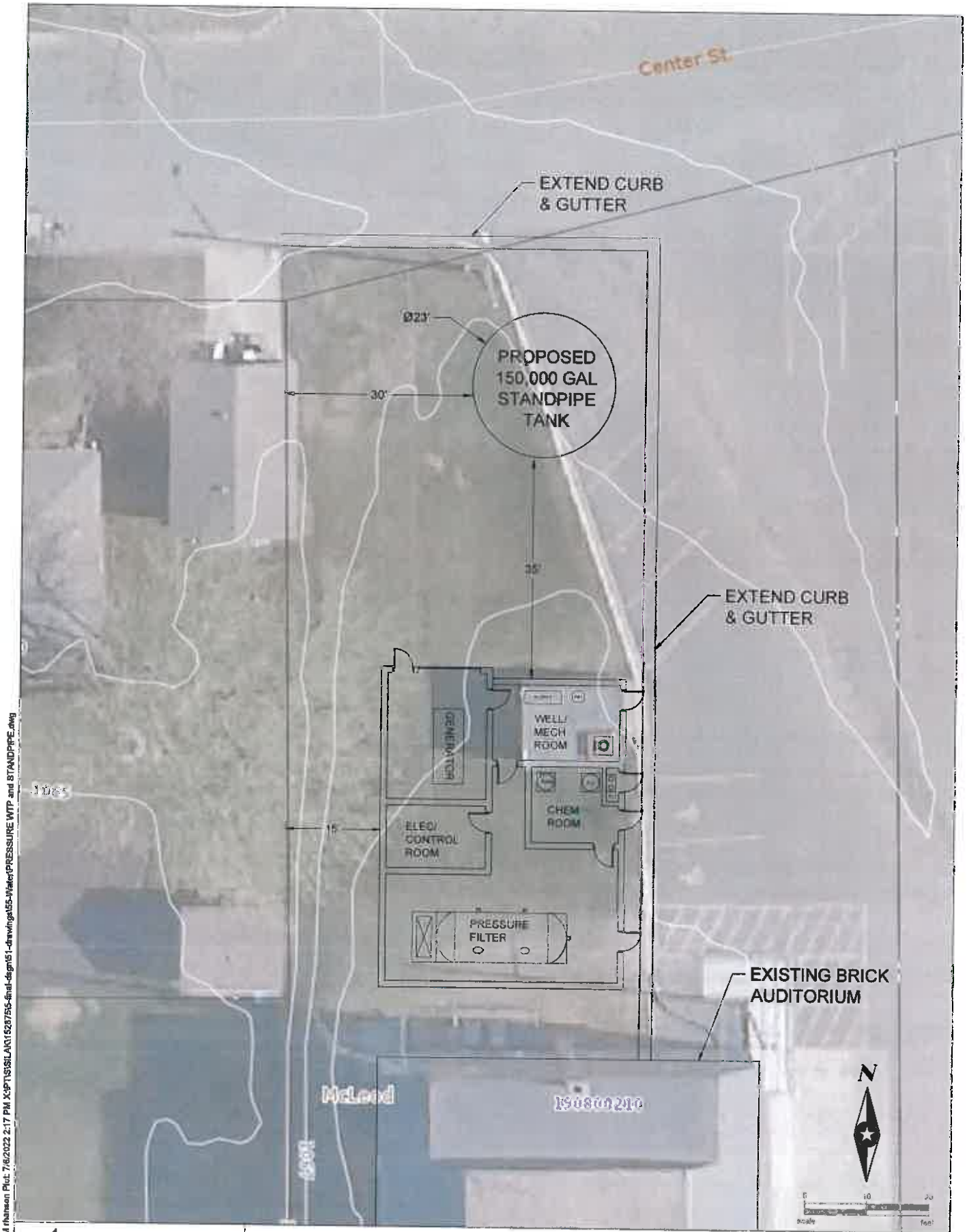
FIGURE NO. 9



SEH
PHONE: 651.490.2000
3535 VADNAIS CENTER DRIVE
ST. PAUL, MN 55110-5196
www.sehinc.com

WATER TREATMENT PLANT ALTERNATIVE - NEW □RAVIT□ FILTRATION WTP

FIGURE NO. 10



Save: 7/6/2022 2:12 PM rhansen Plot: 7/6/2022 2:17 PM X:\PTS\SIL\AK\152875\5-final-dsgn\51-drawings\55-Water\PRESSURE WTP and STAND\PIPE.dwg

SEH
PHONE: 651.490.2000
3535 VADNAIS CENTER DRIVE
ST. PAUL, MN 55110-5196
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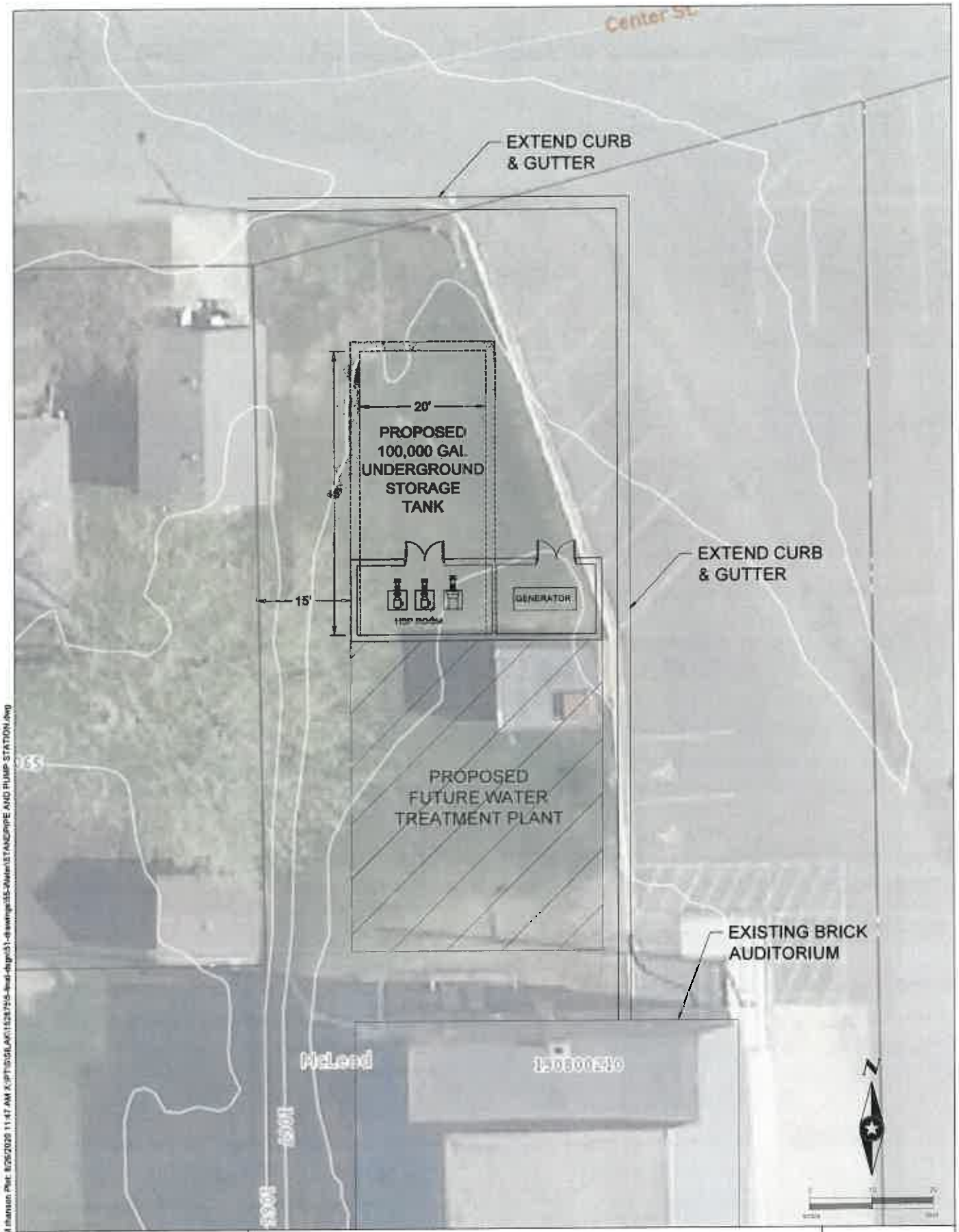
WATER TREATMENT PLANT ALTERNATIVE - NEW PRESSURE FILTRATION WTP & STANDPIPE WATER TANK

FIGURE NO. 11



SEH
PHONE: 651.490.2000
3535 VADNAIS CENTER DRIVE
ST. PAUL, MN 55110-5196
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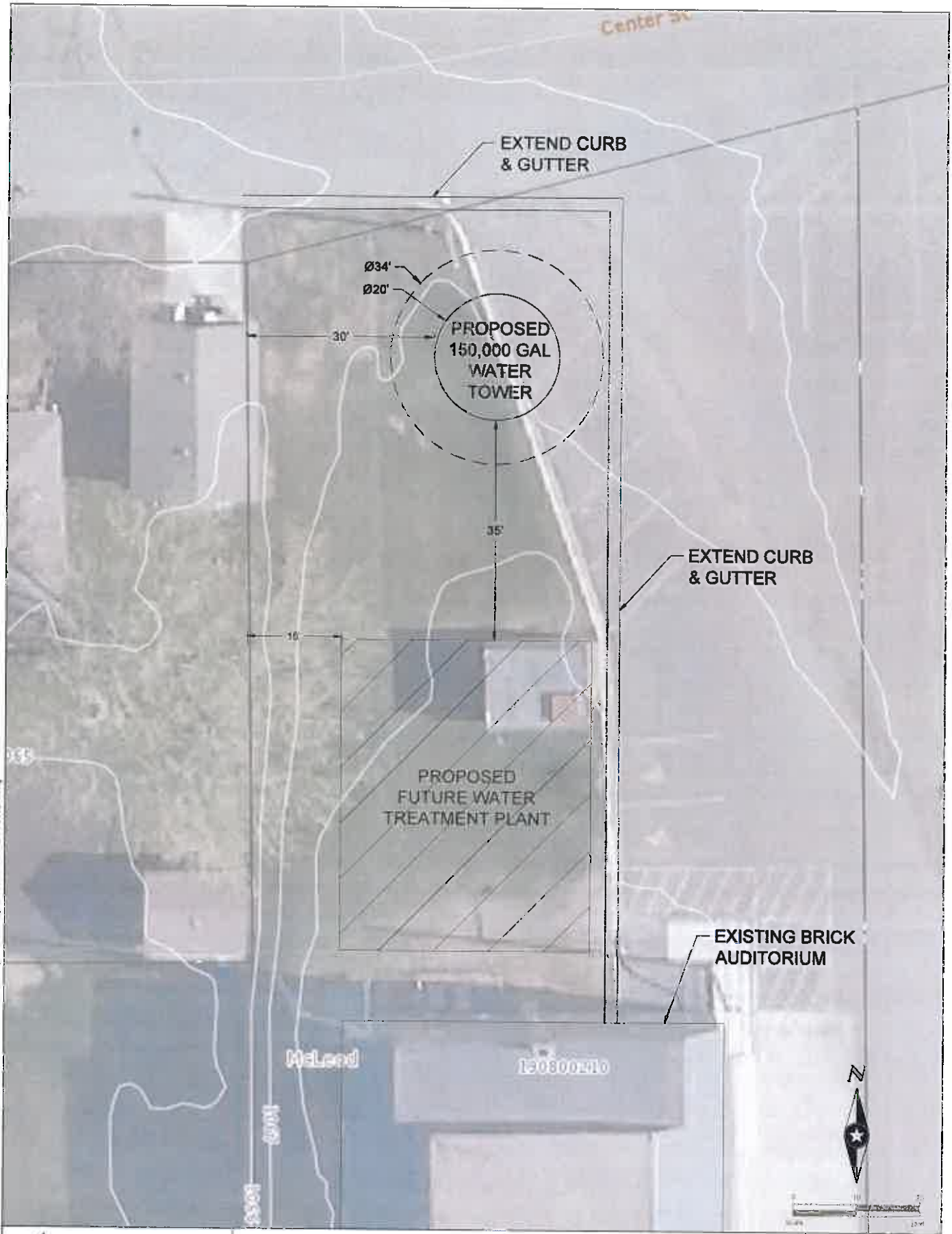
WATER STORA□E ALTERNATIVE -
□□□□□□ □ALLON UNDER□ROUND STORA□E TANK & PUMP STATION

FIGURE NO. 12



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PHONE: 651.490.2000
3535 VADNAIS CENTER DRIVE
ST. PAUL, MN 55110-5196
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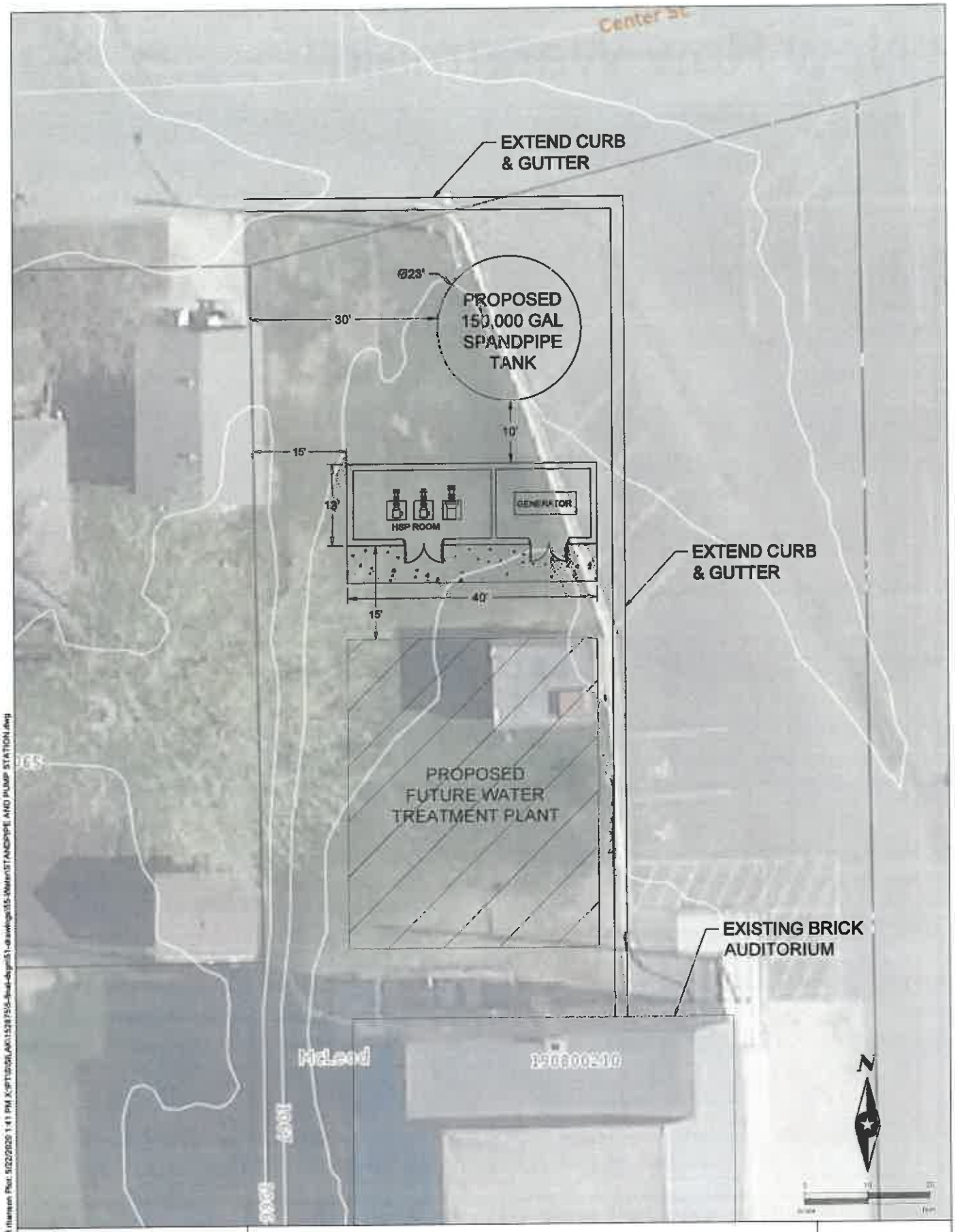
WATER STORAGE ALTERNATIVE -
ELEVATED WATER TOWER

FIGURE
NO. 13



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PHONE: 651.490.2000
3535 VADNAIS CENTER DRIVE
ST. PAUL, MN 55110-5196
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WATER STORA□E ALTERNATIVE -
□□□□□□ □ALLON STANDPIPE & PUMP STATION

FIGURE
NO. 14

New Raw Watermain

Disclaimer: McLeod County does not warrant or guarantee the accuracy of the data.
The data is meant for reference purposes only and should not be used for official decisions.
If you have questions regarding the data presented in this map, please contact the McLeod County GIS Department.

This information is to be used for reference purposes only.

FIGURE 15

Appendix 1

Pond Location Map

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3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (651) 490-2150
WATTS: 800-325-2055
www.sehinc.com

Print Date: 08/20/2020

POND LOCATION MAP

SILVER LAKE, MN

N

NOT TO SCALE

Appendix 2

Well Pumping Data

Historical Well Pumping Data for Silver Lake

Month	2010 (gallons)		2011 (gallons)		2012 (gallons)		2013 (gallons)		2014 (gallons)		2015 (gallons)		2016 (gallons)		2017 (gallons)		2018 (gallons)		2019 (gallons)	
	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2	Well 1	Well 2
Jan	-	1,839,700	-	1,905,300	-	1,757,700	-	1,880,700	-	1,847,800	-	1,889,400	-	1,794,700	-	1,758,400	-	1,791,000	-	1,839,000
Feb	-	1,506,100	-	2,815,300	855,400	593,200	57,000	1,716,600	-	708,000	-	1,663,200	83,400	1,758,600	398,100	1,035,100	-	1,685,000	-	1,550,000
Mar	38,000	1,573,400	2,276,700	748,100	-	1,788,300	-	1,873,700	-	1,931,300	-	1,956,100	-	1,797,500	-	1,651,000	-	1,820,000	-	1,699,000
April	138,200	1,503,700	-	3,168,800	57,000	1,839,800	-	1,858,200	63,000	1,858,900	65,100	1,926,000	64,700	1,873,100	390,200	1,881,100	-	1,855,000	169,000	2,006,000
May	96,000	1,911,600	-	3,414,600	108,000	2,110,200	121,000	2,411,500	653,000	2,049,900	61,200	2,372,900	71,300	2,361,200	13,600	2,831,200	154,000	2,561,000	81,000	1,944,000
June	227,000	2,017,800	1,892,600	479,200	871,100	1,325,900	768,700	1,804,100	-	2,553,600	1,250,100	1,290,900	99,300	2,549,800	142,700	3,196,100	-	2,148,000	9,000	1,516,000
July	333,700	2,049,600	154,200	2,344,400	79,000	2,347,700	159,000	2,204,400	-	249,900	1,106,300	1,521,000	259,200	2,494,900	261,400	3,004,400	-	2,202,000	-	1,514,000
Aug	-	2,396,300	-	2,336,100	-	2,285,300	334,700	3,246,000	77,000	2,550,500	-	2,631,900	59,600	2,631,300	36,200	2,945,500	78,000	2,312,000	-	1,700,000
Sept	131,400	2,061,400	-	1,730,900	337,900	1,807,100	-	2,196,500	803,000	1,262,000	-	2,322,000	-	2,553,200	-	2,031,000	-	1,920,000	-	1,672,000
Oct	67,100	1,915,600	-	1,683,600	-	2,138,400	180,200	1,779,400	137,000	2,112,100	61,000	2,312,600	170,000	1,787,500	-	2,065,000	127,000	2,033,000	430,000	1,856,000
Nov	124,800	1,875,000	53,600	1,572,500	52,000	1,698,800	180,100	1,604,000	-	1,953,600	-	2,046,000	456,300	2,063,800	-	1,720,000	-	1,645,000	128,000	1,829,000
Dec	-	1,819,700	-	1,535,700	-	1,560,800	-	1,937,700	42,000	1,754,700	-	1,934,400	-	1,985,300	140,000	1,665,000	-	1,567,100	-	1,394,000
Well Total	1,156,200	22,469,900	4,377,100	23,734,500	2,360,400	21,253,200	1,800,700	24,312,800	1,775,000	20,832,100	2,543,700	23,666,400	1,243,800	25,850,900	1,382,200	25,783,800	359,000	23,539,100	817,000	20,319,000
Total Pumped	23,626,100		28,111,600		23,613,600		26,113,500		22,607,100		26,410,100		26,894,700		27,166,000		23,898,100		21,136,000	
Ave. Month	1,968,842		2,342,633		1,967,800		2,176,125		1,883,925		2,200,842		2,241,225		2,263,833		1,991,508		1,761,333	
Ave. Day	65,309		77,708		65,274		72,186		62,492		73,005		74,344		75,094		66,061		58,426	

Note: A peak day flow was hit in 2010 with a demand of 126,000 gallons.

Appendix 3

Well Inspections 2017–2019

McCARTHY WELL COMPANY

590 Citation Drive - Suite I, Shakopee MN 55379-1862
Phone 952-854-5333 ~ Fax 952-445-1950

"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 8/1/2019
Well/Pump Name: 1

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

1. Check Wiring & Connections- Good — ◉ Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ◉ Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 238 L 2-5 241 L 3-6 241 — ◉ Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 235 L 2-5 232 L 3-6 234 Hertz 60 — ◉ Good ○ Fair ○ Poor
5. Check Motor Amps- L1 53.2 L2 51.7 L3 56.3 Utilization 100% — ◉ Good ○ Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ◉ Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ◉ Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ◉ Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ◉ Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ◉ Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ◉ Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ◉ Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ◉ Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ◉ Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ◉ Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ◉ Good ○ Fair ○ Poor
17. Check Pumping Rate- 250 ◉ G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ◉ Good ○ Fair ○ Poor
18. Check Water Levels-Static 40' Pumping 53' Yield Good GPM Per Foot of Draw Down — ◉ Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service over 5 years since it was repaired by McCarthy Well Co.

Report By: Tim McCarthy

McCARTHY WELL COMPANY

590 Citation Drive - Suite I, Shakopee MN 55379-1862
Phone 952-854-5333 ~ Fax 952-445-1950

"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 7/23/2018

Well/Pump Name: 1

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

1. Check Wiring & Connections- Good — ● Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ● Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 237 L 2-5 244 L 3-6 239 — ● Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 236 L 2-5 240 L 3-6 237 Hertz 60 — ● Good ○ Fair ○ Poor
5. Check Motor Amps- L1 46.0 L2 55.0 L3 57.0 Utilization 98% — ○ Good ● Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ● Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ● Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ● Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ● Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ● Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ● Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ● Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ● Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ● Good ○ Fair ○ Poor
17. Check Pumping Rate- 240 ● G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ● Good ○ Fair ○ Poor
18. Check Water Levels-Static 42' Pumping 55' Yield Good GPM Per Foot of Draw Down — ● Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service for long over 5 years. Large amp imbalance.

Report By: Tim McCarthy

McCARTHY WELL COMPANY

590 Citation Drive - Suite I, Shakopee MN 55379-1862
Phone 952-854-5333 ~ Fax 952-445-1950
"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 7/25/2017
Well/Pump Name: 1

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

1. Check Wiring & Connections- Good — ● Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ● Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 238 L 2-5 244 L 3-6 240 — ● Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 231 L 2-5 236 L 3-6 238 Hertz 60 — ● Good ○ Fair ○ Poor
5. Check Motor Amps- L1 42.0 L2 50.0 L3 53.0 Utilization 90% — ○ Good ● Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ● Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ● Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ● Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ● Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ● Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ● Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ● Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ● Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ● Good ○ Fair ○ Poor
17. Check Pumping Rate- 201 ● G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ● Good ○ Fair ○ Poor
18. Check Water Levels-Static 43' Pumping 54' Yield Good GPM Per Foot of Draw Down — ● Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service for long over 5 years.

Report By: Tim McCarthy

McCARTHY WELL COMPANY

590 Citation Drive - Suite I, Shakopee MN 55379-1862
Phone 952-854-5333 ~ Fax 952-445-1950

"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 8/1/2019

Well/Pump Name: 2

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

1. Check Wiring & Connections- Good — ● Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ● Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 241 L 2-5 243 L 3-6 243 — ● Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 236 L 2-5 234 L 3-6 234 Hertz 60 — ● Good ○ Fair ○ Poor
5. Check Motor Amps- L1 58.0 L2 52.0 L3 56.0 Utilization 106% — ● Good ○ Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ● Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ● Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ● Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ● Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ● Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ● Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ● Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ● Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ● Good ○ Fair ○ Poor
17. Check Pumping Rate- 215 ● G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ○ Good ● Fair ○ Poor
18. Check Water Levels-Static 41' Pumping 55' Yield Good GPM Per Foot of Draw Down — ● Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service long over 5 years since it was repaired by McCarthy Well Co.

Report By: Tim McCarthy

McCARTHY WELL COMPANY

590 Citation Drive - Suite I, Shakopee MN 55379-1862
Phone 952-854-5333 ~ Fax 952-445-1950

"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 7/23/2018
Well/Pump Name: 2

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

1. Check Wiring & Connections- Good — ◉ Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ◉ Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 240 L 2-5 242 L 3-6 240 — ◉ Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 233 L 2-5 236 L 3-6 234 Hertz 60 — ◉ Good ○ Fair ○ Poor
5. Check Motor Amps- L1 58.0 L2 56.0 L3 66.0 Utilization 115% — ○ Good ◉ Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ◉ Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ◉ Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ◉ Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ◉ Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ◉ Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ◉ Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ◉ Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ◉ Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ◉ Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ◉ Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ◉ Good ○ Fair ○ Poor
17. Check Pumping Rate- 270 ◉ G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ◉ Good ○ Fair ○ Poor
18. Check Water Levels-Static 43' Pumping 55' Yield Good GPM Per Foot of Draw Down — ◉ Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service long over 5 years since it was repaired by McCarthy Well Co.

Report By: Tim McCarthy

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Phone 952-854-5333 ~ Fax 952-445-1950

"THERE'S NO SUBSTITUTE FOR EXPERIENCE"

"18 POINT PUMP PERFORMANCE INSPECTION REPORT"

City of Silver Lake
Silver Lake MN

Date: 7/25/2017

Well/Pump Name: 2

This report is not to be used to determine compliance with any codes, regulations, laws, or rules. Its sole purpose is to attempt to evaluate the operating performance of the well and pump at the time of the inspection.

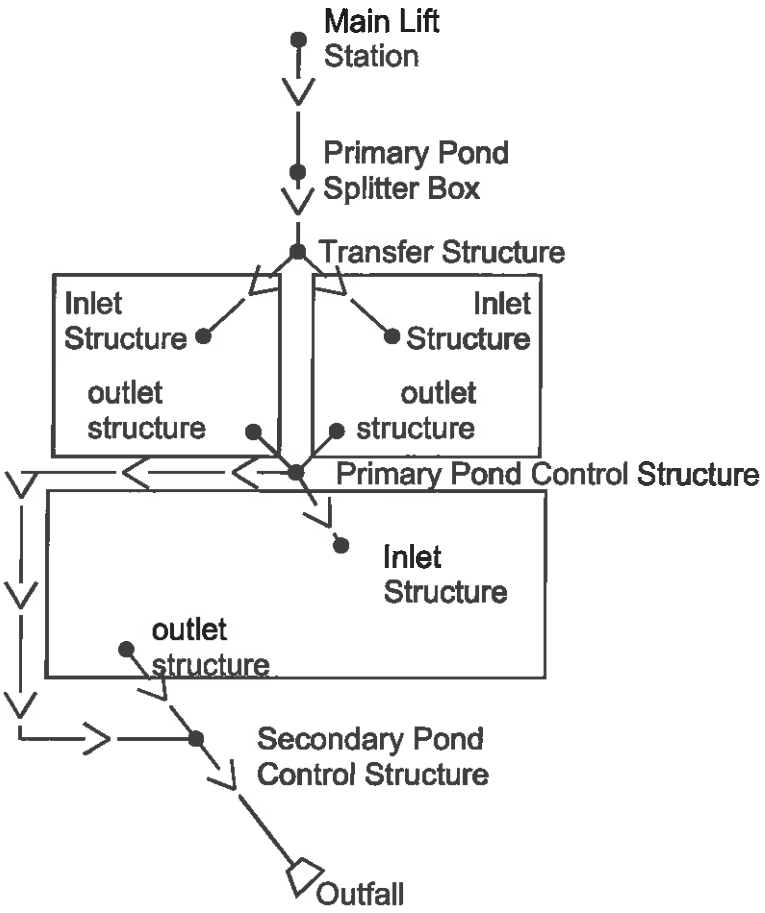
1. Check Wiring & Connections- Good — ● Good ○ Fair ○ Poor
2. Check Starter Overload Protection- Good — ● Good ○ Fair ○ Poor
3. Check Voltage Supply- L 1-4 240 L 2-5 243 L 3-6 239 — ● Good ○ Fair ○ Poor
4. Check Voltage Running- L 1-4 235 L 2-5 237 L 3-6 236 Hertz 60 — ● Good ○ Fair ○ Poor
5. Check Motor Amps- L1 59.0 L2 61.0 L3 63.0 Utilization 117% — ○ Good ● Fair ○ Poor
6. Check Resistance Between Line & Ground- L1 Good L2 Good L3 Good — ● Good ○ Fair ○ Poor
7. Check Resistance Between Motor Windings- L1-2 Good L2-3 Good L1-3 Good — ● Good ○ Fair ○ Poor
8. Check Pump & Motor Operating R.P.M.- 3450 — ● Good ○ Fair ○ Poor
9. Check Temperature-Motor Good Well Room Good — ● Good ○ Fair ○ Poor
10. Check Bearing Lube-Motor Top Good Bottom Good Pump Prelube NA — ● Good ○ Fair ○ Poor
11. Check Bearing Noise-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
12. Check Vibration-Motor Good Pump Good Right Angle Dr NA — ● Good ○ Fair ○ Poor
13. Check Discharge Head Packing Box Bearing- NA — ● Good ○ Fair ○ Poor
14. Check Discharge Line Check Valve- Good Pump Foot Valve Good — ● Good ○ Fair ○ Poor
15. Check Start/Stop Cycle- Good Air Relief/Vacuum Breaker Good — ● Good ○ Fair ○ Poor
16. Check Condition Of Water- Good — ● Good ○ Fair ○ Poor
17. Check Pumping Rate- 270 ● G.P.M. ○ C.F.P.M. Is The Pump Throttled? NO — ● Good ○ Fair ○ Poor
18. Check Water Levels-Static 43' Pumping 58' Yield Good GPM Per Foot of Draw Down — ● Good ○ Fair ○ Poor

Comments:
This unit is operating properly at this time however, the pump has been in service for long over 5 years.

Report By: Tim McCarthy

Appendix 4

Process Pond Diagram


Main Lift
Station
Primary Pond
Splitter Box
Transfer Structure
Inlet
Structure
Inlet
Structure
outlet
structure
outlet
structure
Primary Pond Control Structure
Inlet
Structure
outlet
structure
Secondary Pond
Control Structure
Outfall

Appendix 5

NPDES Permit 2015

STATE OF MINNESOTA

Minnesota Pollution Control Agency

Municipal Division

National Pollutant Discharge Elimination System (NPDES)/
State Disposal System (SDS) Permit MNG580000

Authorization to Operate a
Stabilization Pond Wastewater Treatment Facility

ISSUANCE DATE: September 30, 2010 **EXPIRATION DATE: August 31, 2015**

The state of Minnesota, on behalf of its citizens, through the Minnesota Pollution Control Agency (MPCA), authorizes the Permittee to operate a disposal system at the facility named above and to discharge from this facility to the receiving water named above, in accordance with the requirements of this permit.

The goal of this permit is to protect water quality in accordance with Minnesota and U.S. statutes and rules, including Minn. Stat. chs. 115 and 116, Minn. R. chs. 7001, 7041, 7049, 7050, 7053, 7060 and the U.S. Clean Water Act.

This permit is effective on the issuance date identified above, and supersedes the previous permit that was issued on March 1, 2005. This permit expires at midnight on the expiration date identified above.

Signature: _____

Wendy L. Turri, Manager
Municipal Wastewater Section
Municipal Division

for The Minnesota Pollution Control Agency

Submit DMRs to:
Attention: Discharge Monitoring Reports

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Submit Other WQ Reports to:
Attention: WQ Submittals Center
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Questions on this permit?

- General permit or NPDES program questions, contact the appropriate MPCA regional office found on page two of this Permit.

MPCA Regional Offices

Toll Free Number: 800-657-3864
To report emergencies, call the Minnesota State Duty Officer at 651-649-5451 or toll free at 800-422-0798. Telephone Device for Deaf (TTY): 651-282-5332. 24-hour emergency number: 651-297-5353 or 800-627-3529.

Brainerd/Baxter Office 7678 College Road, Suite 105 Baxter, Minnesota 56425 Phone: 218-828-2492 Fax: 218-828-2594	**Mankato Office** 1230 South Victory Drive Mankato, Minnesota 56001 Phone: 507-389-5997 Fax: 507-389-5422
Detroit Lakes Office 714 Lake Avenue, Suite 220 Detroit Lakes, Minnesota 56567 Phone: 218-847-1519 Fax: 218-846-0719	**Marshall Office** 1420 East College Drive, Suite 900 Marshall, Minnesota 56258 Phone: 507-537-7146 Fax: 507-537-6001
Duluth Office 525 Lake Avenue South, Suite 400 Duluth, Minnesota 55802 Phone: 218-723-4660 Fax: 218-723-4727	**Rochester Office** 18 Wood Lake Drive Rochester, Minnesota 55904 Phone: 507-285-7343 Fax: 507-280-5513
St. Paul Office 520 Lafayette Road North St. Paul, Minnesota 55155 Phone: 651-296-6300 Fax: 651-297-8676	**Willmar Office** 201 – 28th Avenue Southwest Willmar, Minnesota 56201 Phone: 320-214-3786 Fax: 320-214-3787

Table of Contents

Chapter 1. General Stabilization Pond

1. Authorization

1.1 This permit authorizes the Permittee to treat and discharge wastewater in accordance with the provisions of this chapter only after:
a. the Permittee seeking authorization to discharge under this general permit has submitted all necessary application forms to be covered under the general permit,
b. the Permittee meets all the eligibility criteria listed in the following section of this chapter, and
c. the Permittee has received a written Notice of Coverage (NOC) from the MPCA indicating that coverage has been granted.

2. General Permit Applicability Criteria

2.1 The Facility is an existing stabilization and/or aerated pond system with controlled surface water discharge that treats domestic-strength wastewater and is MPCA-classified as a Class D facility. Facilities that have land disposal activities (e.g. spray irrigation, rapid infiltration basins) are ineligible for this permit.

2.2 The Facility is not located in the designated Karst Region in the Southeastern portion of Minnesota that was subject to the 1993 Administrative Order that required the preparation of a contingency plan.

2.3 The average wet weather design flow of the Facility is less than one million gallons per day (mgd).

2.4 The Facility does not have a Significant Industrial User (SIU), as defined per the Definitions section of this permit, that requires additional monitoring and/or limits than this permit requires.

2.5 The collection system and stabilization pond facility do not receive excessive flows that result in upsets, permit violations, or bypassing from the collection system or Facility, or result in regular discharges outside the designated discharge window for that Facility. Facilities that are experiencing excessive flows may be allowed coverage under this permit, provided the NOC contains an Inflow and Infiltration Investigation and Elimination Compliance Schedule to investigate and address the excessive flows (see Inflow and Infiltration Investigation and Elimination Plan section).

2.6 The Facility has at least 180 days of storage if located south of the 46 degrees 25 north latitude (approximately the latitude of Brainerd) and 210 days of storage for facilities north of this line unless previously approved by the MPCA for something less. If design capacity is less than 180 days and 210 days respectively, the Permittee may show that actual flows allow for 180 days and 210 days respectively.

2.7 Stabilization ponds that are part of the Facility do not exceed the allowable seepage rate of 500 gallons per acre per day if the pond was built after May 16, 1975 and 3,500 gallons per acre per day if the pond was built before May 16, 1975. Facilities that are suspected to be leaking may be allowed coverage under this permit, provided the NOC contains a Leaky Pond Evaluation Compliance Schedule to investigate the leakage rate (see Leaky Pond Evaluation section).

2.8 The written NOC from the MPCA will include:
a. a description and topographic map of the location of the Facility covered under this permit;
b. non-degradation language specific to the Facility and receiving waters;
c. mass based limitations applicable to the Facility;
d. phosphorus limitations or Phosphorus Management Plan requirements, if applicable to the Facility;
e. mercury monitoring and Mercury Minimization Plan requirements, if applicable to the Facility;
f. tile line discharge monitoring requirements, if applicable to the Facility;
g. an Inflow and Infiltration Compliance Schedule, if applicable to the Facility;
h. a Leaky Pond Evaluation Compliance Schedule, if applicable to the Facility; and
i. additional monitoring, if applicable to the Facility.

3. Mandatory Limits and Monitoring Requirements

3.1 The limits and monitoring requirements attached to this permit are mandatory for all facilities covered under this general permit. The Permittee shall comply with the limits and monitoring requirements attached at the end of this permit (Attachment 1), as specified below, and in the NOC that accompanied this permit. The results of this monitoring shall be submitted to the MPCA as specified in the Total Facilities section of this permit. Individual values shall be reported on a Discharge Monitoring Report (DMR) Supplemental Form.

4. Facility Specific Limits and Monitoring Requirements

4.1 Mass Limits. The limits and monitoring requirements in this Permit are assigned by the MPCA based on the specific operation and design of the treatment facility. Permittees will be notified of facility specific mass limits in the NOC that accompanies this permit.

4.2 Phosphorus Limits. Permittees required to meet monthly and/or annual Total Phosphorus concentration and/or mass limits will be notified in the NOC that accompanies this permit.

4.3 Additional Monitoring for Facilities with Design Flow Equal to or Greater than 0.1 mgd. Facilities that have average wet weather design flows equal to or greater than 0.1 mgd are required to monitor for Total Nitrate plus Nitrite, Total Ammonia Nitrogen, Total Kjeldahl Nitrogen, and Total Dissolved Solids two (2) times per year during discharge as identified in Attachment 1 of this permit and submit the results on the custom DMR Supplemental Form. Permittees required to monitor for these parameters will be notified in the NOC that accompanies this permit.

4.4 Mercury Monitoring. Facilities that have average wet weather design flows equal to or greater than 0.2 mgd shall monitor for Mercury at the Influent Waste Stream Station and Total Facility Discharge Station as identified in Attachment 1 of this permit.

In addition to the Mercury monitoring required in Attachment 1 of this permit, the Permittee shall analyze the effluent sample from the Total Facility Discharge Station for Dissolved Mercury and Total Suspended Solids twice per year throughout the life of this permit. The sampling method is a concurrent grab sample for the two parameters. Dissolved Mercury shall be analyzed using EPA method 1631, with clean techniques method 1669. Samples shall be collected two (2) times per year during discharge as identified in Attachment of this permit, and reported on the custom supplemental form provided by the MPCA. The custom DMR supplemental form must be submitted with the DMR for the month when the samples are collected.

Permittees required to monitor for Mercury will be notified in the NOC that accompanies this permit.

4.5 Salty Discharge Monitoring. Facilities that receive salty waste streams (e.g. water treatment facilities, ethanol facilities, rendering facilities) in concentrations high enough to potentially impact surface waters are required to monitor for Chlorides, Calcium and Magnesium Hardness at CaCO3, Specific Conductance, Total Dissolved Solids (Salts), Sulfates as SO4, Bicarbonates, Sodium as Na, Calcium, Magnesium, and Potassium two (2) times per year during discharge as identified in Attachment 1 of this permit. Permittees required to monitor for these parameters will be notified in the NOC that accompanies this permit.

4.6 Fecal Coliform Effective Periods. The Permittee must meet the Fecal Coliform Bacteria limit during the effective period as follows:
a. Discharges to Class 2 waters have a fecal coliform bacteria limit effective period from April 1 through October 31.
b. Discharges to Class 7 waters have a fecal coliform bacterial limit effective period from May 1 through October 31.
c. Discharges that are within 25 miles upstream of a drinking water intake have a year-round fecal coliform bacteria limit effluent period, regardless of the classification of the receiving water.

Permittees will be notified of the appropriate Fecal Coliform Effective Period in the NOC that accompanies this permit.

4.7 Tile Line Discharge Monitoring. Permittees that are required to conduct tile line sampling as identified in Attachment 1 of this permit will be notified in the NOC that accompanies this permit.

5. Bypass Structures

5.1 All structures capable of bypassing the treatment system shall be manually controlled and kept locked at all times.

6. Sanitary Sewer Extension Permit

6.1 The Permittee may be required to obtain a Sanitary Sewer Extension Permit from the MPCA prior to the start of construction of any addition, extension or replacement to the sanitary sewer. If a sewer extension permit is required, no construction of any part of the system may begin until that permit has been issued. Please see Fact Sheet #1.15, Sanitary Sewer Modifications, Additions or Extension Permits on www.pca.state.mn.us for further information on Sanitary Sewer Extension Permit requirements.

7. Operator Certification

7.1 The Permittee shall provide, at the minimum, a Class D state certified operator who is in direct responsible charge of the operation, maintenance and testing functions required to ensure compliance with the terms and conditions of the permit. (Minn. Stat. Sec. 115.72)

7.2 If the Permittee chooses to meet operator certification requirements through a contractual agreement, the Permittee shall provide a copy of the contract to the MPCA, WQ Submittals Center. The contract shall include the certified operator's name, certificate number, company name if appropriate, the period covered by the contract and provisions for renewal; the duties and responsibilities of the certified operator; the duties and responsibilities of the permittee; and provisions for notifying the MPCA 30 days in advance of termination if the contract is terminated prior to the expiration date.

7.3 The Permittee shall notify the MPCA within 30 days of a change in operator certification or contract status.

8. Dischargers to a TMDL Reach

8.1 TMDL Impacts. Facilities that discharge to an impaired surface water, watershed or drainage basin may be required to comply with additional permits or permit requirements, including additional restriction or relaxation of limits and monitoring as authorized by the CWA 303(d)(4)(A) and 40 CFR 122.44.l.2.i., necessary to ensure consistency with the assumptions and requirements of any applicable US EPA approved wasteload allocations resulting from Total Maximum Daily Load (TMDL) studies.

9. Waste Stream

Sampling Location

9.1 Grab and composite samples shall be collected at a point representative of total influent flow to the system.

Discharge Monitoring Reports

9.2 Submit a monthly DMR monthly by 21 days after the end of each calendar monthly following permit issuance.

9.3 Influent Mercury Monitoring. If a Permitee eligible for coverage under this Permit is required to monitor influent mercury (specified in the Notice of Coverage), this monitoring is required once in the spring and

once in the fall. The influent mercury monitoring should occur at the same time as the effluent mercury monitoring. Regardless of the month when monitoring occurs in the spring and fall, the monitoring results for spring must be recorded on the June DMR and the monitoring results for fall must be reported on the December DMR.

10. Surface Discharges

Total Facility Discharge Sampling Location

10.1 Samples for the Total Facility Discharge Station shall be collected from the final cell outlet control structure.

General Requirements

10.3 Effluent Salty Discharge Monitoring, mercury monitoring and/or monitoring for nitrogen parameters and total dissolved solids.

All Permittees eligible for coverage under this Permit are required to monitor effluent for the salty discharge parameters of Chlorides, Calcium and Magnesium Hardness as CaCO3, Specific conductance, Total Dissolved Solids (Salts), Sulfates as SO4, Bicarbonates, Sodium as NA, Calcium, Magnesium, Potassium, and Total Salinity at 25 degrees C. This monitoring is required once during a spring discharge and once during a fall discharge. Regardless of the month when monitoring occurs in spring and fall, the monitoring results for spring must be recorded on the June DMR and the monitoring results for fall must be reported on the December DMR. If no discharge occurred in spring and/or fall, the no discharge box must be marked on the respective June and/or December DMR.

If a Permittee eligible for coverage under this Permit is required to monitor effluent for nitrogen parameters and total dissolved solids and/or mercury (specified in the Notice of Coverage), monitoring results are to be reported in the same manner outlined in the previous paragraph.

10.4 Floating solids or visible foam shall not be discharged in other than trace amounts.

10.5 Oil or other substances shall not be discharged in amounts that create a visible color film.

10.6 The Permittee shall install and maintain outlet protection measures at the discharge stations to prevent erosion.

Winter Sampling Conditions

10.7 The Permittee shall sample flows at the designated monitoring stations including when this requires removing ice to sample the water. If the station is completely frozen throughout a designated sampling month, the Permittee shall check the "No Discharge" box on the Discharge Monitoring Report (DMR) and note the ice conditions in Comments on the DMR.

Discharge Monitoring Reports

10.8 The Permittee shall submit monitoring results for discharges in accordance with the limits and monitoring requirements for this station. If no discharge occurred during the reporting period, the Permittee shall check the "No Discharge" box on the Discharge Monitoring Report (DMR).

10.9 For all applicable SD (surface discharge) stations, submit a monthly DMR monthly by 21 days after the end of each calendar month following permit issuance.

11. Groundwater Stations

Tile Line Discharge Sampling Location

11.1 Sample for the Tile Line Discharge Station shall be collected from the final outlet prior to entering any surface water.

Discharge Monitoring Reports

11.2 For all applicable GW (Tile Line) stations, submit a monthly DMR monthly by 21 days after the end of each calendar month for which sampling is required following permit issuance.

12. Stabilization Pond Requirements

Acceptable Discharge Periods

12.1 Acceptable Discharge Periods are March 1 through June 30 and September 1 through December 31 for facilities located in the Detroit Lakes, Brainerd and Duluth regions.

12.2 Acceptable Discharge Periods are March 1 through June 15 and September 15 through December 31 for facilities located in the Marshall, Rochester, Willmar, Mankato and Metropolitan regions.

12.3 Effluent limitations for this permit have been assigned based upon the assumption that the receiving waters exhibit favorable flow and reaeration characteristics during the acceptable discharge periods.

Discharges Outside of Acceptable Discharge Periods

12.4 For discharges occurring outside the acceptable discharge periods, refer to the "Stabilization Pond Guidance Discharge Guidance" located at www.pca.state.mn.us/water/wastewater.html#operation. If any of the discharge occurs outside of the acceptable discharge periods, the Permittee shall notify the MPCA of the potential noncompliance prior to discharge. The Permittee shall call the appropriate regional office and indicate that the call is for notification of a pond discharge.

12.5 For any discharge outside of acceptable discharge periods or to an ice covered receiving water, an adequate dilution ratio is required. If an adequate dilution ratio is not available, receiving water monitoring is required.

12.6 For any discharge outside of acceptable discharge periods or to an ice covered receiving water, the Permittee shall submit a "Discharge Evaluation Report" on a form provided in the "Stabilization Pond Discharge Guidance located at www.pca.state.mn.us/water/wastewater.html#operation.

12.7 Pond Discharge Rate. The discharge rate shall be limited so as not to create a shock load on the receiving waters, disturb the pond bottom sediment in the area of the intake or flood downstream properties. If the drawdown rate should exceed six (6) inches per day, the Permittee shall call the appropriate MPCA regional office and indicate that the call is for notification of a pond discharge.

Pre-discharge Sampling

12.8 If predischarge sample results indicate that one or more of the effluent limitations may be exceeded, the Permittee shall notify the MPCA of potential noncompliance prior to discharge. The Permittee shall call the MPCA at the appropriate regional office and indicate that the call is for notification of a pond discharge.

12.9 Samples shall be taken from four sides of the pond and composited prior to discharge and analyzed for permitted parameters. This sampling must be taken no more than two weeks prior to the beginning of the discharge; dissolved oxygen and pH (both are field tests) must be taken no more than 24 hours prior to the

beginning of the discharge. If more than two weeks pass prior to the beginning of discharge, additional predischarge samples shall be obtained and analyzed prior to discharge.

12.10 Pond Observations. The Permittee shall inspect the pond system weekly, and shall take measurements of pond water depth, estimate the coverage of aquatic plants, floating mats and ice cover on the surface of the ponds, and note odors, the condition of the dikes and the presence of rodents. The Permittee shall maintain records of these weekly inspections for the last three (3) years, and submit the results on the Supplemental Report Form (SRF).

12.11 The Permittee shall maintain daily precipitation records.

13. Phosphorus Management Plan

13.1 Because of the particular concern about the impacts of phosphorus discharged from wastewater treatment facilities on surface waters, the MPCA will either assign an effluent phosphorus limit to the Permittee or require the Permittee to complete and submit a Phosphorus Management Plan (PMP). Permittees will be notified if they have been assigned either an effluent phosphorus limit or required to complete a PMP in the NOC that accompanies this permit. Permittees that have been assigned an effluent phosphorus limit are not required to complete a PMP.

13.2 For Permittees required to complete a PMP, the PMP shall be submitted at least 180 days prior to permit expiration. The PMP shall include, at a minimum, the following:
a. A summary of the recent influent and effluent phosphorus concentrations and mass loadings.
b. An identification of sources of high phosphorus loading to the facility and development of a plan for reducing phosphorus loading. This plan shall include an evaluation of phosphorus reduction opportunities for users or classes of users with high phosphorus loading. When necessary, require high phosphorus loading users to submit PMPs that include identification of user-specific opportunities to reduce phosphorus loads to the Facility.
c. An evaluation of past and present facility operations to determine those operating procedures that result in phosphorus removal to the fullest practicable extent.
d. Information and data relating to potential facility expansions or significant modifications, population growth, and potential phosphorus removal plans that will help to evaluate the current and potential effects of the facility on the receiving water.

Permittees required to submit a PMP will be notified in the NOC that accompanies this permit.

14. Mercury Minimization Plan

14.1 Mercury is present in all municipal and many industrial wastewater discharges. Mercury is a powerful neurotoxin that affects human health and the environment. A naturally-occurring element, mercury does not break down into less-harmful substances over time. Instead, mercury released into the environment accumulates in fish and animal tissues, a process known as bioaccumulation. Widespread mercury contamination has prompted the Minnesota Department of Health (MDH) to issue fish consumption advisories throughout the state. Most of Minnesota's impaired waters are contaminated by mercury and other bioaccumulative toxins. The MPCA is carefully evaluating all mercury discharges in the state.

14.2 For Permittees required to complete and submit a Mercury Minimization Plan (MMP) to the MPCA, the submittal requirements are detailed in this section. If a Permittee has previously submitted a MMP, it must update its MMP and submit the updated MMP to the MPCA. The purpose of the MMP is to evaluate collection and treatment systems to determine possible sources of mercury as well as potential mercury reduction options. Guidelines for developing a MMP are detailed in this section.

Mercury Minimization Plan (Non-Lake Superior Basin Permittees)

14.3 Permittees with average wet weather design flows equal to or greater than 0.2 mgd that do not discharge to the Lake Superior Basin shall submit a Mercury Minimization Plan by 180 days before permit expiration. At a minimum, the MMP must include the following:
a. A summary of mercury influent and effluent concentrations using the most recent five years of monitoring data, if available.
b. Identification of existing and potential sources of mercury concentrations and/or loading to the facility. As appropriate for your facility, you should consider residential, institutional, municipal, and commercial sources (such as dental clinics, hospitals, medical clinics, nursing homes, schools, and industries with potential for mercury contributions). You should also consider other influent mercury sources, such as stormwater inputs, ground water (inflow & infiltration) inputs, and waste streams or sewer tributaries to the wastewater treatment facility.
c. An evaluation of past and present facility operations to determine those operating procedures that maximize mercury removal.
d. A summary of any mercury reduction activities implemented during the last five years.
e. A plan to implement mercury management and reduction measures during the next five years.

Permittees required to submit a MMP will be notified in the NOC that accompanies this permit.

Mercury Minimization Plan (Lake Superior Basin Permittees)

14.4 Permittees with average wet weather design flows equal to or greater than 0.2 mgd that discharge to the Lake Superior basin shall submit a Mercury Minimization Plan by 180 days after permit reissuance. At a minimum, the MMP must include the following.
a. A summary of mercury influent and effluent concentrations using the most recent five years of monitoring data, if available.
b. Identification of existing and potential sources of mercury concentrations and/or loading to the facility. As appropriate for your facility, you should consider residential, institutional, municipal, and commercial sources (such as dental clinics, hospitals, medical clinics, nursing homes, schools, and industries with potential for mercury contributions). You should also consider other influent mercury sources, such as stormwater inputs, ground water (inflow & infiltration) inputs, and waste streams or sewer tributaries to the wastewater treatment facility.
c. An evaluation of past and present facility operations to determine those operating procedures that maximize mercury removal.
d. A summary of any mercury reduction activities implemented during the last five years.
e. A plan to implement mercury management and reduction measures during the next five years.

Permittees required to submit a MMP will be notified in the NOC that accompanies this permit.

14.5 Permittees with facilities that discharge to the Lake Superior basin shall submit an annual update of the MMP to the MPCA Water Quality Submittals Center by March 1 of each year following MPCA approval of the MMP. The annual report shall include, but is not limited to:
a. All minimization program monitoring results for the year.
b. A list of potential sourced of mercury.
c. A summary of all actions taken to meet the effluent limit for mercury.
d. Any updates of the control strategy.

Permitees required to submit a MMP will be notified in the NOC that accompanies this permit.

15. Inflow and Infiltration Investigation and Elimination Plan

15.1 A Permittee that is determined to be receiving excessive inflow and infiltration (I/I) that could cause upsets, bypasses or permit violations is required to complete an I/I Investigation and Elimination Plan (I/I Plan). The NOC that accompanies this permit will specify if a Permittee is required to submit an I/I Plan.

15.2 For Permittees required to complete an I/I Plan, the I/I Plan shall be submitted within 180 days after permit reissuance. At a minimum, the I/I Plan shall include:
a. An evaluation of the collection system data to determine the extent of I/I to the system.
b. Based on the system evaluation the Permittee shall identify all possible sources of I/I by methods such as smoke testing and televising. Possible sources include, but are not limited to, bad service line connections, broken or cracked municipal sewer lines, cracked or broken manholes or lift stations, unsealed manhole covers and illegal clean water connections.
c. An evaluation of the Permittees current policy (ordinance, etc.), or establishment of a policy if absent, concerning the connection of foundation drains, floor drains, sump pumps, roof leaders, etc. from buildings connected to the system and how the Permittee ensures compliance with the policy.
d. A description of past actions by the Permittee to identify and eliminate sources of I/I.
e. A description of current and future actions by the Permittee to identify and eliminate sources of I/I, including implementation and completion dates. The actions and dates specified in the submitted I/I Plan are enforceable provisions.

16. Leaking Pond Evaluation

16.1 A Permittee with a system that has been determined by a desktop water balance to potentially leak above the allowable seepage rate (500 gallons per acre per day if the pond was built after May 16, 1975, and 3,500 gallons per acre per day if the pond was built before May 16, 1975) is required to investigate the leakage rate through a Leaking Pond Evaluation (Evaluation). The NOC that accompanies this permit will specify if the Permittee is required to submit an Evaluation.

16.2 For Permittees required to complete an Evaluation, the Evaluation shall be submitted within 180 days after permit reissuance. At a minimum, the Evaluation shall include:
a. An evaluation of the past and present condition and operation of the pond system, including but not limited to: age of the pond system, liner material, rip rap condition and placement, erosion, presence of deep rooted vegetation, presence of rodents and rodent holes, if the pond system has been hydraulically overloaded and operated in the freeboard zone.
b. A plan to ensure accurate influent and effluent flows, including but not limited to: ensuring flow meters in good working order, installing new flow meters if necessary, calibrating pumps at least twice per year, verifying pond acreages (via survey), verifying pond depths and measurements, ensuring accurate precipitation measurements and accurate discharge volumes.

Upon submittal of the plan and further MPCA review, a system with severe leakage may be removed from the general permit. If that is the case, the Permittee shall submit a NPDES/SDS permit application for an individual permit.

17. Pretreatment

17.1 This chapter only applies to Publicly Owned Treatment Works (POTWs). POTWs are facilities that are owned and operated by a municipality (e.g. city, sanitary district, joint powers board) for public use and the authority operating such a treatment works.

Pretreatment - Definitions

17.2 An "Individual Control Mechanism" is a document, such as an agreement or permit, that imposes limitations or requirements on an individual industrial user of the POTW.

17.3 "Significant Industrial User" (SIU) means any industrial user that:
a. discharges 25,000 gallons per day or more of process wastewater;
b. contributes a load of five (5) % or more of the capacity of the POTW; or
c. is designated as significant by the Permittee or the MPCA on the basis that the SIU has a reasonable potential to adversely impact the POTW, or the quality of its effluent or residuals.

Pretreatment - Permittee Responsibility to Control Users

17.4 It is the Permittee's responsibility to regulate the discharge from users of its wastewater treatment facility. The Permittee shall prevent any pass through of pollutants or any inhibition or disruption of the Permittee's facility, its treatment processes, or its sludge processes or disposal that contribute to the violation of the conditions of this permit or any federal or state law or regulation limiting the release of pollutants from the POTW.

17.5 The Permittee shall prohibit the discharge of the following to its wastewater treatment facility:
a. pollutants which create a fire or explosion hazard, including any discharge with a flash point less than 60 degrees C (140 degrees F);
b. pollutants which would cause corrosive structural damage to the POTW, including any waste stream with a pH of less than 5.0;
c. solid or viscous pollutants which would obstruct flow;
d. heat that would inhibit biological activity, including any discharge that would cause the temperature of the waste stream at the POTW treatment plant headworks to exceed 40 degrees C (104 degrees F);
e. pollutants which produce toxic gases, vapors, or fumes that may endanger the health or safety of workers; or
f. any pollutant, including oxygen demanding pollutants such as biochemical oxygen demand, released at a flow rate or pollutant concentration that will cause interference or pass through.

17.6 The Permittee shall prohibit new discharges of non-contact cooling waters unless there is no cost effective alternative. Existing discharges of non-contact cooling water to the Permittee's wastewater treatment facility shall be eliminated, where elimination is cost-effective, or where an infiltration/inflow analysis and sewer system evaluation survey indicates the need for such removal.

17.7 If the Permittee accepts trucked-in wastes, the Permittee shall evaluate the trucked in wastes prior to acceptance in the same manner as it monitors sewered wastes. The Permittee shall accept trucked-in wastes only at specifically designated points.

17.8 Pollutant of concern means a pollutant that is or may be discharged by an industrial user that is, or reasonably should be of concern on the basis that it may cause the permittee to violate any permit limits on the release of pollutants. The following pollutants shall be evaluated to determine if they should be pollutants of concern: pollutants limited in this permit, pollutants for which monitoring is required in this permit, pollutants that are likely to cause inhibition of the Permittee's POTW, pollutants which may interfere with sludge disposal, and pollutants for which the Permittee's treatment facility has limited capacity.

Control of Significant Industrial Users

17.9 The Permittee shall impose pretreatment requirements on SIUs which will ensure compliance with all applicable effluent limitations and other requirements set forth in this permit or any federal or state law or regulation limiting the release of pollutants from the POTW. These requirements shall be applied to SIUs by means of an individual control mechanism.

17.10 The Permittee shall not knowingly enter into an individual control mechanism with any user that would allow the user to contribute an amount or strength of wastewater that would cause violation of any limitation or requirement in the permit, or any applicable federal, state or local law or regulation.

Monitoring of Significant Industrial Users

17.11 The Permittee shall obtain from SIUs specific information on the quality and quantity of the SIU's discharges to the Permittee's POTW. Except where specifically requested by the Permittee and approved by the MPCA, this information shall be obtained by means of representative monitoring conducted by the Permittee or by the SIU under requirements imposed by the Permittee in the SIU's individual control

mechanism. Monitoring performed to comply with this requirement shall include all pollutants for which the SIU is significant and shall be done at a frequency commensurate with the significance of the SIU.

Pretreatment - Reporting and Notification

17.12 If a SIU discharges to the POTW during a given calendar year, the Permittee shall submit a Pretreatment Annual Report for that calendar year, due by January 31 of the following year. The Pretreatment Annual Report shall be submitted on forms provided by the agency or shall provide equivalent information.

The Permittee shall submit the pre-treatment report to the following address:

MPCA
Attn: WQ Submittals Center
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

17.13 The Permittee shall notify the MPCA in writing of any:
a. SIU of the Permittee's POTW which has not been previously disclosed to the MPCA;
b. anticipated or actual changes in the volume or quality of discharge by an industrial user that could result in the industrial user becoming an SIU as defined in this chapter; or
c. anticipated or actual changes in the volume or quality of discharges by a SIU that would require changes to the SIU's required local limits.

This notification shall be submitted within 30 days of identifying the IU as a SIU. Where changes are proposed, they must be submitted prior to changes being made.

17.14 Upon notifying the MPCA of a SIU or change in a SIU discharge as required above, the Permittee shall submit the following information on forms provided by the agency or in a comparable format:
a. the identity of the SIU and a description of the SIU's operation and process;
b. a characterization of the SIU's discharge;
c. the required local limits that will be imposed on the SIU;
d. a technical justification of the required local limits; and
e. a plan for monitoring the SIU which is consistent with monitoring requirements in this chapter

17.15 In addition, the Permittee shall, upon request, submit the following to the MPCA for approval:
a. additional information on the SIU, its processes and discharge;
b. a copy of the individual control mechanism used to control the SIU;
c. the Permittee's legal authority to be used for regulating the SIU; and
d. the Permittee's procedures for enforcing the requirements imposed on the SIU.

16.16 The permittee shall notify MPCA of any of its industrial users that may be subject to national categorical pretreatment standards.

17.17 This permit may be modified in accordance with Minnesota Rules, ch. 7001 to require development of a pretreatment program approvable under the Federal General Pretreatment Regulation (40 CFR 403).

Individual Permit Criteria

17.18 Upon review of any SIU notification or report submitted, if the MPCA believes that additional monitoring beyond the requirements of this permit is necessary due to the characterization of the SIU discharger, the Permittee shall submit an application for an individual NPDES/SDS permit.

18. Total Facilities Requirements

General Requirements

18.1 Incorporation by Reference. The following applicable federal and state laws are incorporated by reference in this permit, are applicable to the Permittee, and are enforceable parts of this permit: 40 CFR pts. 122.41, 122.42, 136, 403 and 503; Minn. R. pts. 7001, 7041, 7045, 7050, 7052, 7053, 7060, and 7080; and Minn. Stat. Sec. 115 and 116.

18.2 Permittee Responsibility. The Permittee shall perform the actions or conduct the activity authorized by the permit in compliance with the conditions of the permit and, if required, in accordance with the plans and specifications approved by the Agency. (Minn. R. 7001.0150, subp. 3, item E)

18.3 Toxic Discharges Prohibited. Whether or not this permit includes effluent limitations for toxic pollutants, the Permittee shall not discharge a toxic pollutant except according to Code of Federal Regulations, Title 40, sections 400 to 460 and Minnesota Rules 7050, 7052, 7053 and any other applicable MPCA rules. (Minn. R. 7001.1090, subp.1, item A)

18.4 Nuisance Conditions Prohibited. The Permittee's discharge shall not cause any nuisance conditions including, but not limited to: floating solids, scum and visible oil film, acutely toxic conditions to aquatic life, or other adverse impact on the receiving water. (Minn. R. 7050.0210 subp. 2)

18.5 Property Rights. This permit does not convey a property right or an exclusive privilege. (Minn. R. 7001.0150, subp. 3, item C)

18.6 Liability Exemption. In issuing this permit, the state and the MPCA assume no responsibility for damage to persons, property, or the environment caused by the activities of the Permittee in the conduct of its actions, including those activities authorized, directed, or undertaken under this permit. To the extent the state and the MPCA may be liable for the activities of its employees, that liability is explicitly limited to that provided in the Tort Claims Act. (Minn. R. 7001.0150, subp. 3, item O)

18.7 The MPCA's issuance of this permit does not obligate the MPCA to enforce local laws, rules, or plans beyond what is authorized by Minnesota Statutes. (Minn. R. 7001.0150, subp.3, item D)

18.8 Liabilities. The MPCA's issuance of this permit does not release the Permittee from any liability, penalty or duty imposed by Minnesota or federal statutes or rules or local ordinances, except the obligation to obtain the permit. (Minn. R. 7001.0150, subp.3, item A)

18.9 The issuance of this permit does not prevent the future adoption by the MPCA of pollution control rules, standards, or orders more stringent than those now in existence and does not prevent the enforcement of these rules, standards, or orders against the Permittee. (Minn. R. 7001.0150, subp.3, item B)

18.10 Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

18.11 Compliance with Other Rules and Statutes. The Permittee shall comply with all applicable air quality, solid waste, and hazardous waste statutes and rules in the operation and maintenance of the facility.

18.12 Inspection and Entry. When authorized by Minn. Stat. Sec. 115.04; 115B.17, subd. 4; and 116.091, and upon presentation of proper credentials, the agency, or an authorized employee or agent of the agency, shall be allowed by the Permittee to enter at reasonable times upon the property of the Permittee to examine and copy books, papers, records, or memoranda pertaining to the construction, modification, or operation of the facility covered by the permit or pertaining to the activity covered by the permit; and to conduct surveys and investigations, including sampling or monitoring, pertaining to the construction, modification, or operation

of the facility covered by the permit or pertaining to the activity covered by the permit. (Minn. R. 7001.0150, subp.3, item I)

18.13 Control Users. The Permittee shall regulate the users of its wastewater treatment facility so as to prevent the introduction of pollutants or materials that may result in the inhibition or disruption of the conveyance system, treatment facility or processes, or disposal system that would contribute to the violation of the conditions of this permit or any federal, state or local law or regulation. (40 CFR 403)

Sampling

18.14 Representative Sampling. Samples and measurements required by this permit shall be conducted as specified in this permit and shall be representative of the discharge or monitored activity. (40 CFR 122.41 (j)(1))

18.15 Additional Sampling. If the Permittee monitors more frequently than required, the results and the frequency of monitoring shall be reported on the Discharge Monitoring Report (DMR) or another MPCA-approved form for that reporting period. (Minn. R. 7001.1090, subp. 1, item E)

18.16 Certified Laboratory. A laboratory certified by the Minnesota Department of Health shall conduct analyses required by this permit. Analyses of dissolved oxygen, pH, temperature and total residual oxidants (chlorine, bromine) do not need to be completed by a certified laboratory but shall comply with manufacturer's specifications for equipment calibration and use. (Minn. Stat. Sec. 144.97 through 144.98 and Minn. R. 4740.2010 and 4740.2050 through 4740.2120) (Minn. Stat. Sec. 144.97 through 144.98 and Minn. R. 4740.2010 through 4740.2040)

18.17 Sample Preservation and Procedure. Sample preservation and test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and Minn. R. 7041.3200.

18.18 Equipment Calibration: Flow meters, pumps, flumes, lift stations or other flow monitoring equipment used for purposes of determining compliance with permit shall be checked and/or calibrated for accuracy at least twice annually. (Minn. R. 7001.0150, subp. 2, items B and C)

18.19 Maintain Records. The Permittee shall keep the records required by this permit for at least three years, including any calculations, original recordings from automatic monitoring instruments, and laboratory sheets. The Permittee shall extend these record retention periods upon request of the MPCA. The Permittee shall maintain records for each sample and measurement. The records shall include the following information (Minn. R. 7001.0150, subp. 2, item C):
a. The exact place, date, and time of the sample or measurement;
b. The date of analysis;
c. The name of the person who performed the sample collection, measurement, analysis, or calculation; and
d. The analytical techniques, procedures and methods used; and
e. The results of the analysis.

18.20 Completing Reports. The Permittee shall submit the results of the required sampling and monitoring activities on the forms provided, specified, or approved by the MPCA. The information shall be recorded in the specified areas on those forms and in the units specified. (Minn. R. 7001.1090, subp. 1, item D; Minn. R. 7001.0150, subp. 2, item B)

Required forms may include:

DMR Supplemental Form

Individual values for each sample and measurement must be recorded on the DMR Supplemental Form which, if required, will be provided by the MPCA. DMR Supplemental Forms shall be submitted with the appropriate DMRs. You may design and use your own supplemental form; however it must be approved by the MPCA. Note: Required summary information MUST also be recorded on the DMR. Summary

information that is submitted ONLY on the DMR Supplemental Form does not comply with the reporting requirements.

18.21 Submitting Reports. DMRs and DMR Supplemental Forms shall be submitted to:

MPCA
Attn: Discharge Monitoring Reports
520 Lafayette Road North
St. Paul, Minnesota 55155-4194.

DMRs and DMR Supplemental Forms shall be postmarked by the 21st day of the month following the sampling period or as otherwise specified in this permit. A DMR shall be submitted for each required station even if no discharge occurred during the reporting period. (Minn. R. 7001.0150, subps. 2.B and 3.H)

Other reports required by this permit shall be postmarked by the date specified in the permit to:

MPCA
Attn: WQ Submittals Center
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

18.22 Incomplete or Incorrect Reports. The Permittee shall immediately submit an amended report or DMR to the MPCA upon discovery by the Permittee or notification by the MPCA that it has submitted an incomplete or incorrect report or DMR. The amended report or DMR shall contain the missing or corrected data along with a cover letter explaining the circumstances of the incomplete or incorrect report. (Minn. R. 7001.0150 subp. 3, item G)

18.23 Required Signatures. All DMRs, forms, reports, and other documents submitted to the MPCA shall be signed by the Permittee or the duly authorized representative of the Permittee. Minn. R. 7001.0150, subp. 2, item D. The person or persons that sign the DMRs, forms, reports or other documents must certify that he or she understands and complies with the certification requirements of Minn. R. 7001.0070 and 7001.0540, including the penalties for submitting false information. Technical documents, such as design drawings and specifications and engineering studies required to be submitted as part of a permit application or by permit conditions, must be certified by a registered professional engineer. (Minn. R. 7001.0540)

18.24 Records. The Permittee shall, when requested by the Agency, submit within a reasonable time the information and reports that are relevant to the control of pollution regarding the construction, modification, or operation of the facility covered by the permit or regarding the conduct of the activity covered by the permit. (Minn. R. 7001.0150, subp. 3, item H)

18.25 Confidential Information. Except for data determined to be confidential according to Minn. Stat. Sec. 116.075, subd. 2, all reports required by this permit shall be available for public inspection. Effluent data shall not be considered confidential. To request the Agency maintain data as confidential, the Permittee must follow Minn. R. 7000.1300.

Noncompliance and Enforcement

18.26 Subject to Enforcement Action and Penalties. Noncompliance with a term or condition of this permit subjects the Permittee to penalties provided by federal and state law set forth in section 309 of the Clean Water Act; United States Code, title 33, section 1319, as amended; and in Minn. Stat. Sec. 115.071 and 116.072, including monetary penalties, imprisonment, or both. (Minn. R. 7001.1090, subp. 1, item B)

18.27 Criminal Activity. The Permittee may not knowingly make a false statement, representation, or certification in a record or other document submitted to the Agency. A person who falsifies a report or document submitted to the Agency, or tampers with, or knowingly renders inaccurate a monitoring device

or method required to be maintained under this permit is subject to criminal and civil penalties provided by federal and state law. (Minn. R. 7001.0150, subp.3, item G., 7001.1090, subps. 1, items G and H and Minn. Stat. Sec. 609.671)

18.28 Noncompliance Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (40 CFR 122.41(c))

18.29 Effluent Violations. If sampling by the Permittee indicates a violation of any discharge limitation specified in this permit, the Permittee shall immediately make every effort to verify the violation by collecting additional samples, if appropriate, investigate the cause of the violation, and take action to prevent future violations. Violations that are determined to pose a threat to human health or a drinking water supply, or represent a significant risk to the environment shall be immediately reported to the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 (toll free) or (651)649-5451 (metro area). In addition, you may also contact the MPCA during business hours. Otherwise the violations and the results of any additional sampling shall be recorded on the next appropriate DMR or report.

18.30 Unauthorized Releases of Wastewater Prohibited. Except for conditions specifically described in Minn. R. 7001.1090, subp. 1, items J and K, all unauthorized bypasses, overflows, discharges, spills, or other releases of wastewater or materials to the environment, whether intentional or not, are prohibited. However, the MPCA will consider the Permittee's compliance with permit requirements, frequency of release, quantity, type, location, and other relevant factors when determining appropriate action. (40 CFR 122.41 and Minn. Stat. Sec 115.061)

18.31 Discovery of a release. Upon discovery of a release, the Permittee shall:

a. Take all reasonable steps to immediately end the release.

b. Notify the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 (toll free) or (651)649-5451 (metro area) immediately upon discovery of the release. In addition, you may also contact the MPCA during business hours at 1(800) 657-3864.

c. Recover as rapidly and as thoroughly as possible all substances and materials released or immediately take other action as may be reasonably possible to minimize or abate pollution to waters of the state or potential impacts to human health caused thereby. If the released materials or substances cannot be immediately or completely recovered, the Permittee shall contact the MPCA. If directed by the MPCA, the Permittee shall consult with other local, state or federal agencies (such as the Minnesota Department of Natural Resources and/or the Wetland Conservation Act authority) for implementation of additional clean-up or remediation activities in wetland or other sensitive areas.

d. Collect representative samples of the release. The Permittee shall sample the release for parameters of concern immediately following discovery of the release. The Permittee may contact the MPCA during business hours to discuss the sampling parameters and protocol. In addition, Fecal Coliform Bacteria samples shall be collected where it is determined by the Permittee that the release contains or may contain sewage. If the release cannot be immediately stopped, the Permittee shall consult with MPCA regarding additional sampling requirements. Samples shall be collected at least, but not limited to, two times per week for as long as the release continues.

e. Submit the sampling results as directed by the MPCA. At a minimum, the results shall be submitted to the MPCA with the next DMR.

18.32 Upset Defense. In the event of temporary noncompliance by the Permittee with an applicable effluent limitation resulting from an upset at the Permittee's facility due to factors beyond the control of the Permittee, the Permittee has an affirmative defense to an enforcement action brought by the Agency as a result of the noncompliance if the Permittee demonstrates by a preponderance of competent evidence:

a. The specific cause of the upset:

b. That the upset was unintentional;

c. That the upset resulted from factors beyond the reasonable control of the Permittee and did not result from operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or increases in production which are beyond the design capability of the treatment facilities;

d. That at the time of the upset the facility was being properly operated;
e. That the Permittee properly notified the Commissioner of the upset in accordance with Minn. R. 7001.1090, subp. 1, item I; and
f. That the Permittee implemented the remedial measures required by Minn. R. 7001.0150, subp. 3, item J.

Operation and Maintenance

18.33 The Permittee shall at all times properly operate and maintain the facilities and systems of treatment and control, and the appurtenances related to them which are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. The Permittee shall install and maintain appropriate backup or auxiliary facilities if they are necessary to achieve compliance with the conditions of the permit and, for all permits other than hazardous waste facility permits, if these backup or auxiliary facilities are technically and economically feasible Minn. R. 7001.0150. subp. 3, item F.

18.34 In the event of a reduction or loss of effective treatment of wastewater at the facility, the Permittee shall control production or curtail its discharges to the extent necessary to maintain compliance with the terms and conditions of this permit. The Permittee shall continue this control or curtailment until the wastewater treatment facility has been restored or until an alternative method of treatment is provided, (Minn. R. 7001.1090, subp. 1, item C)

18.35 Solids Management. The Permittee shall properly store, transport, and dispose of biosolids, septage, sediments, residual solids, filter backwash, screenings, oil, grease, and other substances so that pollutants do not enter surface waters or ground waters of the state. Solids should be disposed of in accordance with local, state and federal requirements. (40 CFR 503 and Minn. R. 7041 and applicable federal and state solid waste rules)

18.36 Scheduled Maintenance. The Permittee shall schedule maintenance of the treatment works during non-critical water quality periods to prevent degradation of water quality, except where emergency maintenance is required to prevent a condition that would be detrimental to water quality or human health. (Minn. R. 7001.0150. subp. 3. item F and Minn. R. 7001.0150. subp. 2, item B)

18.37 Control Tests. In-plant control tests shall be conducted at a frequency adequate to ensure compliance with the conditions of this permit. (Minn. R. 7001.0150. subp. 3. item F and Minn. R. 7001.0150. subp. 2. item B)

Changes to the Facility or Permit

18.38 Permit Modifications. No person required by statute or rule to obtain a permit may construct, install, modify, or operate the facility to be permitted, nor shall a person commence an activity for which a permit is required by statute or rule until the Agency has issued a written permit for the facility or activity. (Minn. R. 7001.0030)

Permittees that propose to make a change to the facility or discharge that requires a permit modification must follow Minn. R. 7001.0190. If the Permittee cannot determine whether a permit modification is needed, the Permittee must contact the MPCA prior to any action. It is recommended that the application for permit modification be submitted to the MPCA at least 180 days prior to the planned change.

18.39 Construction. No construction shall begin until the Permittee receives written approval of plans and specifications from the MPCA (Minn. Stat. Sec. 115.03(f).

Plans, specifications and MPCA approval are not necessary when maintenance dictates the need for installation of new equipment, provided the equipment is the same design size and has the same design

intent. For instance, a broken pipe, lift station pump, aerator, or blower can be replaced with the same design-sized equipment without MPCA approval.

If the proposed construction is not expressly authorized by this permit, it may require a permit modification. If the construction project requires an Environmental Assessment Worksheet under Minn. R. 4410, no construction shall begin until a negative declaration is issued and all approvals are received or implemented.

18.40 Report Changes. The Permittee shall give advance notice as soon as possible to the MPCA of any substantial changes in operational procedures, activities that may alter the nature or frequency of the discharge, and/or material factors that may affect compliance with the conditions of this permit. (Minn. R. 7001.0150, subp. 3, item M)

18.41 Chemical Additives. The Permittee shall receive prior written approval from the MPCA before increasing the use of a chemical additive authorized by this permit, or using a chemical additive not authorized by this permit, in quantities or concentrations that have the potential to change the characteristics, nature and/or quality of the discharge.

The Permittee shall request approval for an increased or new use of a chemical additive at least 60 days, or as soon as possible, before the proposed increased or new use.

This written request shall include at least the following information for the proposed additive:
a. The process for which the additive will be used;
b. Material Safety Data Sheet (MSDS) which shall include aquatic toxicity, human health, and environmental fate information for the proposed additive;
c. A complete product use and instruction label;
d. The commercial and chemical names and Chemical Abstract Survey (CAS) number for all ingredients in the additive (If the MSDS does not include information on chemical composition, including percentages for each ingredient totaling to 100%, the Permittee shall contact the supplier to have this information provided); and
e. The proposed method of application, application frequency, concentration, and daily average and maximum rates of use.

Upon review of the information submitted regarding the proposed chemical additive, the MPCA may require additional information be submitted for consideration. This permit may be modified to restrict the use or discharge of a chemical additive and include additional influent and effluent monitoring requirements.

Approval for the use of an additive shall not justify the exceedance of any effluent limitation nor shall it be used as a defense against pollutant levels in the discharge causing or contributing to the violation of a water quality standard.

18.42 MPCA Initiated Permit Modification, Suspension, or Revocation. The MPCA may modify or revoke and reissue this permit pursuant to Minn. R. 7001.0170. The MPCA may revoke without reissuance this permit pursuant to Minn. R. 7001.0180.

18.43 Permit Transfer. The permit is not transferable to any person without the express written approval of the Agency after compliance with the requirements of Minn. R. 7001.0190. A person to whom the permit has been transferred shall comply with the conditions of the permit. (Minn. R., 7001.0150, subp. 3, item N)

18.44 Facility Closure. The Permittee is responsible for closure and postclosure care of the facility. The Permittee shall notify the MPCA of a significant reduction or cessation of the activities described in this permit at least 180 days before the reduction or cessation. The MPCA may require the Permittee to provide to the MPCA a facility Closure Plan for approval.

Facility closure that could result in a potential long-term water quality concern, such as the ongoing discharge of wastewater to surface or ground water, may require a permit modification or reissuance.

The MPCA may require the Permittee to establish and maintain financial assurance to ensure performance of certain obligations under this permit, including closure, postclosure care and remedial action at the facility. If financial assurance is required, the amount and type of financial assurance, and proposed modifications to previously MPCA-approved financial assurance, shall be approved by the MPCA.

18.45 Permit Reissuance. If the Permittee desires to continue permit coverage beyond the date of permit expiration, the Permittee shall submit an application for reissuance at least 180 days before permit expiration. If the Permittee does not intend to continue the activities authorized by this permit after the expiration date of this permit, the Permittee shall notify the MPCA in writing at least 180 days before permit expiration.

If the Permittee has submitted a timely application for permit reissuance, the Permittee may continue to conduct the activities authorized by this permit, in compliance with the requirements of this permit, until the MPCA takes final action on the application, unless the MPCA determines any of the following (Minn. R. 7001.0040 and 7001.0160):
a. The Permittee is not in substantial compliance with the requirements of this permit, or with a stipulation agreement or compliance schedule designed to bring the Permittee into compliance with this permit;
b. The MPCA, as a result of an action or failure to act by the Permittee, has been unable to take final action on the application on or before the expiration date of the permit;
c. The Permittee has submitted an application with major deficiencies or has failed to properly supplement the application in a timely manner after being informed of deficiencies.

19. Definitions

19.1 "Act" means the federal Clean Water Act, as amended, 33 U.S. Code 1251 et seq.

19.2 "Average Wet Weather Flow (AWW)" means the daily average flow for the wettest 30 consecutive days for mechanical facilities or for the wettest 180 days for controlled discharge pond systems. The 180 consecutive days for pond system must be based on either the storage period form approximately November 15 through May 15 or the storage period from approximately May 15 through November 15.

19.3 "Bypass" means an intentional diversion of a waste stream from any portion of the treatment facility.

19.4 "Calendar Month Average" is calculated by adding all daily values measured during a calendar month and dividing by the number of daily values measured during that month. The "Calendar Month Average" limit is an upper limit.

19.5 "Calendar Month Geometric Mean" is calculated by multiplying the value of all samples taken during the month by each other, where the number of samples = n, and calculating the nth root of the product. The "Calendar Month Geometric Mean" is an upper limit.

19.6 "Calendar Month Minimum" is the lowest value of single samples taken throughout the month. The "Calendar Month Minimum" is a lower limit.

19.7 "Calendar Month Total" is calculated by adding all daily values measured during a calendar month. It is usually expressed in mass or volume units. The "Calendar Month Total" is an upper limit.

19.8 "Calendar Month Total Intervention Limit" is an upper limit that, if exceeded, requires the need for specified response actions by the Permittee. The "Calendar Month Total Intervention Limit" is calculated by adding all of the daily values measured during a calendar month.

19.9 "CFR" means the Code of Federal Regulations.

19.10 "Commissioner" shall mean the commissioner of the Minnesota Pollution Control Agency or a designated representative.

19.11 "Composite sample" means collecting two or more individual samples to combine into a composite sample. A "flow composite sample" is a combination of individual samples taken at equal time intervals, combined using a volume of each sample that is proportional to the flow or equal volume samples taken at intervals of equal flow volumes.

19.12 "Direct discharge" means the "discharge of a pollutant."

19.13 "Discharge" means the conveyance, channeling, runoff, or drainage of waste water, including stormwater and snow melt from a site.

19.14 "Disposal System" means a system for disposing of sewage, industrial waste or other wastes, and includes sewer systems and treatment works.

19.15 "Dissolved Mercury" means all BrCl-oxidizable mercury forms and species found in the filtrate of an aqueous solution that has been filtered through a 0.45-µm filter.

19.16 "Duty Officer" means the Minnesota Duty Officer, Department of Public Safety, Division of Emergency Management.

19.17 "Effluent Limitation" means a restriction established by rule or permit condition on quantities, discharge rates, and concentrations of pollutants that are discharged from point sources into waters of the state.

19.18 "Emergency Incident" means all emergency bypasses, spills, or any other environmental emergency as described in the MPCA "Emergency Notification Guidance for Wastewater Treatment Facilities."

19.19 "Grab" sample type is an individual sample collected from one location at one point in time.

19.20 "Indirect Discharger" means a nondomestic discharger that introduces pollutants into a publicly owned treatment works.

19.21 "Infiltration" means water other than wastewater that enters a sewerage system (including sewer service connections) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.

19.22 "Infiltration/Inflow" means the total quantity of water from both infiltration and inflow without distinguishing the source.

19.23 "Inflow" means water other than wastewater that enters a sewerage system (including sewer service connections) from sources such as roof leaders, cellar drains, yard drains, area drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

19.24 "Instantaneous Maximum" is the highest value recorded when continuous monitoring is used or when the reporting frequency is not specifically defined. The "Instantaneous Maximum" limit is an upper limit. The highest value recorded is reported.

19.25 "Maximum Calendar Week Average" is calculated by adding the value of all samples for a specific parameter taken within a single week, and dividing by the number of samples taken during the week. The highest of all of the weekly averages calculated in a calendar month shall be reported. The "Maximum Calendar Week Average" is an upper limit.

19.26 "MPCA" means the Minnesota Pollution Control Agency, or Minnesota Pollution Control Agency staff as delegated by the Minnesota Pollution Control Agency.

19.27 "NPDES" means National Pollutant Discharge Elimination System which is the program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing permits and imposing and enforcing pretreatment requirements under sections, 307, 318, 402 and 405 of the Clean Water Act, United States Code, title 33, sections 1317, 1328, 1342 and 1345.

19.28 "Operator" means a person who has full and active responsibility for the daily on-site operation of the system. "Operator" does not include office personnel, laborers, transporters, corporate directors, elected officials, or other individuals in managerial roles unless such individuals are directly involved in on-site supervision or operation of a waste disposal facility.

19.29 "Outstanding Resource Value Waters" are waters within the Boundary Waters Canoe Area Wilderness, Voyageur's National Park, and Department of Natural Resources designated scientific and natural areas, wild, scenic, and recreational river segments, Lake Superior, those portions of the Mississippi River from Lake Itasca to the southerly boundary of Morrison County that are included in the Mississippi Headwaters Board comprehensive plan dated February 12, 1981, and other waters of the state with high water quality, wilderness characteristics, unique scientific or ecological significance, exceptional recreational value, or other special qualities which warrant stringent protection from pollution.

19.30 "Permittee" means the entity identified as Permittee on the cover letter authorizing coverage under this permit.

19.31 "Parameters of Concern" include the following: pollutants limited in this permit, pollutants for which monitoring is required in this permit, pollutants that are likely to cause inhibition of the Permittee's POTW, pollutants that are likely to interfere with sludge disposal, pollutants for which the Permittee's treatment facility has limited capacity, pollutants of concern to the Permittee, Mercury and Phosphorus, toxins, or pollutants causing nuisance conditions.

19.32 "Point Source" means a discernible, confined, and discrete conveyance, including, but not limited to, a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

19.33 "Pollutant" means any sewage, industrial waste, or other wastes, as defined in Minnesota Statutes chapter 115.01, discharged into a disposal system or to waters of the state.

19.34 "POTW or Publicly Owned Treatment Works" means a wastewater treatment works owned and operated by a municipality or sanitary district for public use, and the authority operating such a treatment works.

19.35 "Release" means any bypass, overflow, discharge, spill, or other release of wastewater or materials to the environment.

19.36 "Sanitary Sewer Extension Permit" means a state disposal system permit for the extension, addition, or change of a municipal sanitary system.

19.37 "SDS" means State Disposal System and generally describes a permit issued by the state of Minnesota that is non-surface water discharging or land application facilities.

19.38 "Single Value" is a reported value from a single sample or measurement for which there is no limit.

19.39 "Surface waters" means waters of the state including streams, lakes, ponds, marshes, watercourses, waterways, springs, reservoirs, and all other bodies or accumulations of water, natural or artificial, public or private, which are contained within, flow through, or border upon the state.

19.40 "Total Maximum Daily Load" or "TMDL" means the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background, as more fully defined in 40 CFR 130.2(i). A TMDL sets and allocates the maximum amount of a pollutant that may be introduced into a water of the state and still assure attainment and maintenance of water quality standards.

19.41 "Total Mercury" means all BrCl-oxidizable mercury forms and species found in an unfiltered aqueous solution. This includes, but is not limited to, Hg(II), Hg(0), strongly organo-complexed Hg(II) compounds, adsorbed particulate Hg, and several tested covalently bound organo-mercurials (e.g., CH3HgCl, (CH3)2Hg, and C6H5HgOOCCH3). The recovery of Hg bound within microbial cells may require the additional step of UV photo-oxidation. In this Method, total mercury and total recoverable mercury are synonymous.

19.42 "Upset" means an exceptional incident in which the permit discharge limits are unintentionally and temporarily exceeded due to factors beyond the reasonable control of the Permittee.

19.43 "Waters of the State" means all streams, lakes, ponds, marshes, wetlands, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Attachment 1
Limits and Monitoring Requirements for All General Pond Facilities

The limits and monitoring requirements in this attachment are mandatory for all facilities covered under this General Pond Permit unless noted otherwise in the Limits and Monitoring table. For parameters with a limit of "As specified in NOC," concentration and mass limits will be specified individually in each NOC, as applicable. For parameters with a limit of "Monitor Only, As specified in NOC," monitoring requirements will be specified individually in each NOC, as applicable.

Influent Waste Stream Station

Samples shall be collected from a point representative of the total flow to the system, prior to the primary cell.

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Jan - Dec	Measurement, Continuous	1/Day	3
Flow	Monitor Only	mgd	Calendar Month Maximum	Jan - Dec	Measurement, Continuous	1/Day	3
Flow	Monitor Only	MG	Calendar Month Total	Jan - Dec	Measurement, Continuous	1/Day	3
BOD, Carbonaceous 05 Day (20 Deg C)	Monitor Only	mg/L	Calendar Quarter Average	Jan - Dec	4-Hour Flow Composite	1/Quarter	8
Solids, Total Suspended (TSS)	Monitor Only	mg/L	Calendar Quarter Average	Jan - Dec	4-Hour Flow Composite	1/Quarter	8
Phosphorus, Total (as P)	Monitor Only	mg/L	Calendar Quarter Average	Jan - Dec	4-Hour Flow Composite	1/Quarter	8
Mercury, Total (as Hg) *(A)	Monitor Only, As specified in NOC	ng/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	4
pH	Monitor Only	Standard Units	Instantaneous Maximum	Jan - Dec	Grab	1/Quarter	1
Precipitation	Monitor Only	Inches	Calendar Month Total	Jan – Dec	Measurement	1/Day	3

Total Facility Discharge

Samples shall be collected from the outlet control structure during discharge events.

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Flow	Monitor Only	mgd	Calendar Month Average	Mar - Jun, Sep - Dec	Measurement, Continuous	1/Day	11
Flow	Monitor Only	MG	Calendar Month Total	Mar - Jun, Sep - Dec	Measurement, Continuous	1/Day	11
Flow	0	MG	Calendar Month Total Intervention	Jan – Feb, Jul, Aug	Measurement, Continuous	1/Day	11
BOD, Carbonaceous 05 Day (20 Deg C)	40	mg/L	Maximum Calendar Week Average	Jan - Dec	Grab	2/Week	9
BOD, Carbonaceous 05 Day (20 Deg C)	As specified in NOC	kg/day	Maximum Calendar Week Average	Jan - Dec	Grab	2/Week	10
BOD, Carbonaceous 05 Day (20 Deg C)	25	mg/L	Calendar Month Average	Jan - Dec	Grab	2/Week	9
BOD, Carbonaceous 05 Day (20 Deg C)	As specified in NOC	kg/day	Calendar Month Average	Jan - Dec	Grab	2/Week	10
Solids, Total Suspended (TSS)	65	mg/L	Maximum Calendar Week Average	Jan - Dec	Grab	2/Week	9
Solids, Total Suspended (TSS)	As specified in NOC	kg/day	Maximum Calendar Week Average	Jan - Dec	Grab	2/Week	10
Solids, Total Suspended (TSS)	45	mg/L	Calendar Month Average	Jan - Dec	Grab	2/Week	9
Solids, Total Suspended (TSS)	As specified in NOC	kg/day	Calendar Month Average	Jan - Dec	Grab	2/Week	10

Phosphorus, Total (as P) *(B)	As specified in NOC	mg/L	Calendar Month Average	Jan - Dec	Grab	2/Week	9
Phosphorus, Total (as P) *(B)	As specified in NOC	kg/day	Calendar Month Average	Jan – Dec	Grab	2/Week	10
Fecal Coliform, MPN or Membrane Filter 44.5C *(C)	200	#100ml	Calendar Month Geometric Mean	As specified in NOC	Grab	2/Week	9
Oxygen, Dissolved	Monitor Only	mg/L	Calendar Month Minimum	Jan - Dec	Grab	2/Week	2
pH	6.0	Standard Units	Calendar Month Minimum	Jan - Dec	Grab	2/Week	2
pH	9.0	Standard Units	Calendar Month Maximum	Jan - Dec	Grab	2/Week	2
Mercury, Total (as Hg) *(D)	Monitor Only, As specified in NOC	ng/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	6
Nitrite Plus Nitrate, Total (as N) *(E)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	5
Nitrogen, Ammonia, Total (as N) *(E)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	5
Nitrogen, Kjeldahl, Total *(E)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	5
Solids, Total Dissolved (TDS) *(F)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul - Dec	Grab	1/Half Year	5
Bicarbonates *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Chloride, Total *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Hardness, Ca and Mg Calculated (as $CaCO_3$) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Specific Conductance	Monitor Only, As specified in NOC	umh/cm	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Sulfates, Total (as SO_4) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Sodium, Total (as Na) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Calcium, Total (as Ca) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Magnesium, Total (as Mg) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5
Potassium, Total (as K) *(G)	Monitor Only, As specified in NOC	mg/L	Calendar Month Maximum	Jan – Jun, Jul-Dec	Grab	1/Half Year	5

Tile Line Discharges

Samples shall be collected from the tile line outlet prior to entering the receiving water. **Applicable only to facilities with tile line outlets.**

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency	Notes
Chloride, Total	Monitor Only	mg/L	Single Value	Apr, Jul, Oct	Grab	As specified in NOC	7
Fecal Coliform, MPN or Membrane Filter 44.5C	Monitor Only	#100ml	Single Value	Apr, Jul, Oct	Grab	As specified in NOC	7
Specific Conductance	Monitor Only	umh/cm	Single Value	Apr, Jul, Oct	Grab	As specified in NOC	7

NOTES:

1. Analyze immediately, except holidays and weekends. Samples may be collected at any time during the quarter, but the results shall be reported on the DMR for the last month of the quarter (e.g. the sample for the first calendar quarter of Jan-Mar shall be reported on the March DMR).
2. Analyze immediately. Sampling required twice per week only during discharge
3. Except weekends and holidays.
4. Please refer to Chapter 1, Waste Stream Station Section. Monitoring results are taken once in spring and once in fall, preferably at the same time effluent is sampled for mercury. Results are reported on the June and December DMRs. EPA method 1631, with clean techniques method 1669, and any revisions to that method or another approved EPA wastewater method for low level mercury must be used for sampling and analysis.
5. Please refer to Chapter 1, Surface Discharge Station Section. Only two effluent samples per year are required, once during the acceptable spring discharge window ad once during the acceptable fall discharge window. Regardless of when sampling occurs, spring samples must be reported on the June DMR and fall samples must be reported on the December DMR.
6. Please refer to Chapter 1, Surface Discharge Station Section. Only two effluent samples per year are required, once during the acceptable spring discharge window ad once during the acceptable fall discharge window. Regardless of when sampling occurs, spring samples must be reported on the June DMR and fall samples must be reported on the December DMR. EPA method 1631, with clean techniques method 1669, and any revisions to that method or another approved EPA wastewater method for low level mercury must be used for sampling and analysis.
7. Required only if discharge present.
8. Samples may be collected at any time during the calendar quarter, but the results shall be reported on the DMR for the last month of the quarter (e.g. the sample for the first calendar quarter of Jan-Mar shall be reported on the March DMR).
9. Sampling required twice per week only during discharge.
10. Sampling required twice per week only during discharge. Mass limits generally are calculated based on the acreage of the secondary cell(s) and a 6-inch per day draw-down discharge rate from that cell(s).
11. See Chapter 1, Section 11, Acceptable Discharge Periods for further information.

Limits and Monitoring Requirement Footnotes:

*(A) Only required for facilities with Average Wet Weather Design Flows of greater than 0.200 MGD and/or located within the Lake Superior Basin. **Permittees will be notified in the NOC that accompanies their permit if this monitoring requirement applies to their facility.**

*(B) Monitor only, unless concentration and mass limits are specified in the NOC accompanying this permit.

*(C) Discharges to Class 2 waters have a fecal coliform bacteria limit effective period from April 1 through October 31. Discharges to Class 7 waters have a fecal coliform bacterial limit effective period from May 1 through October 31. Discharges that are within 25 miles upstream of a drinking water intake have a year-round fecal coliform bacteria limit effluent period, regardless of the classification of the receiving water.

*(D) Only required for facilities with Average Wet Weather Design Flows of greater than 0.200 MGD and/or located within the Lake Superior Basin. **Permittees will be notified in the NOC that accompanies their permit if this monitoring requirement applies to their facility.**

*(E) Only required for facilities with AWWDF of greater than 0.100 MGD. **Permittees will be notified in the NOC that accompanies their permit if these monitoring requirements apply to their facility.**

*(F) Only required for facilities with AWWDF of greater than 0.100 MGD AND/OR for facilities that receive salty waste streams See Chapter 1, Section 4, Facility Specific Limits and Monitoring for further information. If both conditions exist, sampling frequency will be determined by the most restrictive schedule.

*(G) Only required for facilities that receive salty waste streams. See Chapter 1, Section 4, Facility Specific Limits and Monitoring for further information. **Permittees will be notified in the NOC that accompanies their permit if these monitoring requirements apply to their facility.**

Appendix 6

O&M Costs 2017–2019

Sewer Expense	2017	2018	2019
E 608-49450-100 Wages and Salaries	$8,402.98	$5,252.29	$7,194.58
E 608-49450-121 PERA	-$12,503.98	-$4,915.53	$511.69
E 608-49450-122 Social Security	$592.15	$312.42	$397.10
E 608-49450-123 Medicare	$138.47	$73.08	$92.84
E 608-49450-131 Employer Share Health	$1,323.00	$773.33	$1,066.41
E 608-49450-132 Employer Share Dental	$0.00	$0.00	$0.00
E 608-49450-133 Employer Share Life	$5.85	$4.03	$5.26
E 608-49450-134 Health Savings Account	$441.91	$167.01	$243.66
E 608-49450-135 Flex Spending Account	$250.00	$95.02	$0.00
E 608-49450-151 Worker s Comp Insurance Prem	$904.00	$679.00	-$236.00
E 608-49450-200 Office Supplies	$195.14	$175.43	$204.14
E 608-49450-210 Operating Supplies	$151.04	$403.07	$28.44
E 608-49450-212 Motor Fuels	$36.64	$25.40	$47.85
E 608-49450-216 Chemicals and Chem Products	$349.50	$0.00	$0.00
E 608-49450-220 Repair & Maint Supplies	$531.71	$0.00	$449.98
E 608-49450-240 Small Tools,Minor Equip	$0.00	$0.00	$0.00
E 608-49450-301 Auditing and Acct g Services	$3,200.00	$4,200.00	$4,200.00
E 608-49450-303 Engineering Fees	$0.00	$0.00	$0.00
E 608-49450-304 Legal Fees	$0.00	$0.00	$0.00
E 608-49450-308 Training Fees	$0.00	$745.48	$331.09
E 608-49450-309 EDP, Software and Design	$699.60	$745.91	$807.66
E 608-49450-311 Laboratory/Testing Fees	$0.00	$0.00	$0.00
E 608-49450-319 Contract Services	$27,954.11	$23,553.61	$34,102.67
E 608-49450-321 Telephone	$2,381.28	$1,813.43	$700.40
E 608-49450-322 Postage	$844.71	$877.78	$863.31
E 608-49450-328 Pager Service	$0.00	$0.00	$0.00
E 608-49450-331 Travel Expenses	$0.00	$180.65	$0.00
E 608-49450-352 General Notices	$160.66	$0.00	$0.00
E 608-49450-360 Insurance	$1,877.00	$1,785.00	$1,744.50
E 608-49450-381 Electric Utilities	$5,857.27	$7,701.02	$7,671.91
E 608-49450-382 Water Utilities	$146.22	$148.97	$148.29
E 608-49450-383 Gas Utilities	$402.63	$467.49	$341.72
E 608-49450-385 Sewer Utilities	$188.21	$146.10	$145.85
E 608-49450-387 Storm Sewer Utility	$48.00	$288.00	$330.00
E 608-49450-402 Repairs & Maint Bldg & Struct	$0.00	$735.83	$421.15
E 608-49450-403 Repairs & Maint Other Improve	$9,860.00	$3,528.41	$0.00
E 608-49450-404 Repairs & Maint Machine/Equip	$11,002.00	$5,339.31	$25,732.33
E 608-49450-410 Rentals	$0.00	$0.00	$0.00
E 608-49450-422 Depr. Exp Contributed	$0.00	$0.00	$0.00
E 608-49450-423 Depr. Exp Acquired	$58,392.00	$58,854.00	$60,019.00
E 608-49450-425 Amorization Expense	$0.00	$0.00	$0.00
E 608-49450-430 Miscellaneous	$0.00	$0.00	$0.00
E 608-49450-432 Uncollectable Debts	$0.00	$0.00	$0.00
E 608-49450-433 Dues & Subscriptions	$179.00	$179.45	$179.45
E 608-49450-437 Licenses & Permits	$2,584.00	$1,423.05	$2,365.10
E 608-49450-442 Bank Fees	$0.00	$0.00	$0.00
E 608-49450-520 Capital Buildings & Structures	$12,357.87	$0.00	$0.00
E 608-49450-530 Capital Other Improvements	$0.00	$0.00	$0.00
E 608-49450-540 Capital Heavy Machinery/Equip	$2,252.50	$0.00	$0.00
E 608-49450-560 Capital Furniture & Fixtures	$372.25	$0.00	$0.00
E 608-49450-570 Capital Office Equipment	$0.00	$0.00	$0.00
E 608-49450-580 Capital Other Equipment	$0.00	-$0.50	$0.00
E 608-49450-601 Bond Principal	$0.00	$0.00	$0.00
E 608-49450-611 Bond Interest	$3,400.00	$531.75	$0.00
E 608-49450-620 Fiscal Agent s Fees	$0.00	$0.00	$0.00
E 608-49450-721 Transfer to General Fund	$0.00	$0.00	$0.00
E 608-49450-722 Transfer to Special Revenue F	$0.00	$0.00	$0.00
E 608-49450-723 Transfer to Debt Service Fund	$5,000.00	$5,000.00	$5,000.00
E 608-49450-724 Transfer to Capital Fund	$0.00	$0.00	$0.00

Storm Sewer Expense	2017	2018	2019
E 609-49650-100 Wages and Salaries	$0.00	$299.08	$1,938.39
E 609-49650-121 PERA	$0.00	$19.62	$120.13
E 609-49650-122 Social Security	$0.00	$16.16	$92.79
E 609-49650-123 Medicare	$0.00	$3.79	$21.70
E 609-49650-131 Employer Share Health	$0.00	$47.21	$182.73
E 609-49650-133 Employer Share Life	$0.00	$0.14	$0.59
E 609-49650-134 Health Savings Account	$0.00	$0.00	$0.00
E 609-49650-135 Flex Spending Account	$0.00	$0.00	$0.00
E 609-49650-171 Uniform Allowance	$0.00	$0.00	$0.00
E 609-49650-210 Operating Supplies	$0.00	$0.00	$0.00
E 609-49650-212 Motor Fuels	$0.00	$0.00	$0.00
E 609-49650-216 Chemicals and Chem Products	$0.00	$0.00	$0.00
E 609-49650-220 Repair & Maint Supplies	$0.00	$0.00	$0.00
E 609-49650-240 Small Tools,Minor Equip	$0.00	$0.00	$0.00
E 609-49650-301 Auditing and Acct g Services	$0.00	$0.00	$0.00
E 609-49650-303 Engineering Fees	$0.00	$0.00	$1,520.50
E 609-49650-309 EDP, Software and Design	$0.00	$0.00	$59.00
E 609-49650-319 Contract Services	$0.00	$14,549.41	$121.94
E 609-49650-340 Advertising	$0.00	$0.00	$0.00
E 609-49650-352 General Notices	$0.00	$0.00	$0.00
E 609-49650-360 Insurance	$0.00	$0.00	$0.00
E 609-49650-401 Repairs & Maint Land	$0.00	$1,535.00	$825.00
E 609-49650-402 Repairs & Maint Bldg & Struct	$2,056.00	$0.00	$6,774.00
E 609-49650-403 Repairs & Maint Other Improve	$0.00	$10,385.65	$3,115.50
E 609-49650-422 Depr. Exp Contributed	$0.00	$0.00	$0.00
E 609-49650-423 Depr. Exp Acquired	$18,316.00	$18,366.00	$18,366.00
E 609-49650-430 Miscellaneous	$0.00	$0.00	$0.00
E 609-49650-437 Licenses & Permits	$0.00	$0.00	$0.00
E 609-49650-510 Capital Land	$0.00	$0.00	$0.00
E 609-49650-520 Capital Buildings & Structures	$0.00	$0.00	$0.00
E 609-49650-530 Capital Other Improvements	$0.00	$0.00	$0.00
E 609-49650-610 Interest	$0.00	$0.00	$0.00
E 609-49650-611 Bond Interest	$0.00	$0.00	$0.00
E 609-49650-721 Transfer to General Fund	$0.00	$0.00	$0.00

Water Expense	2017	2018	2019
E 607-49400-100 Wages and Salaries	$8,882.07	$5,048.90	$4,738.68
E 607-49400-121 PERA	-$2,626.45	-$4,887.49	$360.68
E 607-49400-122 Social Security	$576.71	$306.72	$276.39
E 607-49400-123 Medicare	$134.88	$71.75	$64.62
E 607-49400-131 Employer Share Health	$1,323.70	$742.86	$837.84
E 607-49400-132 Employer Share Dental	$0.00	$0.00	$0.00
E 607-49400-133 Employer Share Life	$5.83	$3.92	$4.48
E 607-49400-134 Health Savings Account	$433.53	$124.15	$220.02
E 607-49400-135 Flex Spending Account	$250.00	$95.02	$0.00
E 607-49400-151 Worker s Comp Insurance Prem	$586.00	$531.00	-$188.00
E 607-49400-200 Office Supplies	$195.14	$184.73	$204.14
E 607-49400-210 Operating Supplies	$369.99	$54.15	$86.20
E 607-49400-212 Motor Fuels	$0.00	$25.41	$47.85
E 607-49400-216 Chemicals and Chem Products	$0.00	$0.00	$0.00
E 607-49400-220 Repair & Maint Supplies	$42.10	$91.80	$385.04
E 607-49400-240 Small Tools,Minor Equip	$0.00	$2,112.26	$535.03
E 607-49400-301 Auditing and Acct g Services	$3,200.00	$4,200.00	$4,200.00
E 607-49400-307 Credit Card Fees	$0.00	$239.40	$418.54
E 607-49400-308 Training Fees	$125.00	$780.48	$331.09
E 607-49400-309 EDP, Software and Design	$699.58	$745.89	$807.64
E 607-49400-319 Contract Services	$25,604.49	$22,045.00	$27,269.59
E 607-49400-321 Telephone	$479.98	$502.59	$696.69
E 607-49400-322 Postage	$854.61	$884.32	$863.85
E 607-49400-328 Pager Service	$0.00	$0.00	$0.00
E 607-49400-331 Travel Expenses	$0.00	$123.08	$0.00
E 607-49400-352 General Notices	$470.69	$922.60	$800.96
E 607-49400-360 Insurance	$1,035.00	$1,101.00	$1,228.50
E 607-49400-381 Electric Utilities	$5,659.57	$6,557.08	$3,702.31
E 607-49400-403 Repairs & Maint Other Improve	$0.00	$4,475.00	$0.00
E 607-49400-404 Repairs & Maint Machine/Equip	$0.19	$13,989.47	$5,927.75
E 607-49400-410 Rentals	$0.00	$0.00	$0.00
E 607-49400-423 Depr. Exp Acquired	$42,223.00	$42,347.00	$43,113.00
E 607-49400-430 Miscellaneous	$46.57	$0.00	$0.00
E 607-49400-431 Cash Short	$0.00	$18.34	$22.77
E 607-49400-432 Uncollectable Debts	$0.00	$0.00	$0.00
E 607-49400-433 Dues & Subscriptions	$179.00	$179.45	$179.45
E 607-49400-437 Licenses & Permits	$666.30	$560.92	$281.01
E 607-49400-442 Bank Fees	$0.00	$4.00	$4.00
E 607-49400-520 Capital Buildings & Structures	$2,156.47	$0.00	$0.00
E 607-49400-540 Capital Heavy Machinery/Equip	$0.00	$0.00	$0.00
E 607-49400-560 Capital Furniture & Fixtures	$372.25	$0.00	$0.00
E 607-49400-570 Capital Office Equipment	$0.00	$0.00	$0.00
E 607-49400-580 Capital Other Equipment	$0.00	$0.00	$24,240.00
E 607-49400-723 Transfer to Debt Service Fund	$35,000.00	$35,000.00	$35,000.00
E 607-49400-724 Transfer to Capital Fund	$0.00	$0.00	$0.00

Appendix 7

Iron & Manganese Pilot Study Report

Pilot Study Report for the Removal of Iron and Manganese

Well Number 2

Silver Lake Water Utility

City of Silver Lake, Minnesota

SEH Project No A-SILAK0501.00

September 18, 2006

SEH

Multidisciplined. Single Source.
Trusted solutions for more than 75 years.

SEH

September 18, 2006

RE: Pilot Study Report for the Removal of Iron and Manganese
Silver Lake Water Utility
City of Silver Lake, Minnesota
SEH No. A-SILAK0501.00

Mr. Kerry Vernier
Clerk-Treasurer
City of Silver Lake
308 W. Main St.
Silver Lake, MN 55381-0347

Dear Mr. Vernier:

Short Elliott Hendrickson Inc.® (SEH) is pleased to provide you with this pilot study report for City Well Number 2. The purpose of the study was to establish water treatment methods to effectively remove dissolved iron and manganese from the City of Silver Lake's water supply.

We appreciated the help provided by the City of Silver Lake Public Works Staff in completing the pilot study. Their knowledge and experience with the water system was extremely helpful in conducting the study.

We also appreciated this opportunity to be of continued assistance to the City of Silver Lake Water Utility. We look forward to assisting you in the future with your water supply engineering needs. Please feel free to contact us if you have any questions or if you need additional information.

Sincerely,

Douglas E. Klamerus, PE
Project Manager

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September 18, 2006

Pilot Study Report for the Removal of Iron and Manganese

Well Number 2

Prepared for the City of Silver Lake, Minnesota

1.0 Introduction

The City of Silver Lake retained Short Elliott Hendrickson Inc. (SEH®) to conduct a pilot study of Well Number 2. The purpose of the pilot study was to assess the effectiveness of various treatment processes for the removal of dissolved iron and manganese from water pumped from the well.

High levels of dissolved iron and manganese are very common in groundwater supplies in the upper Midwest region of the United States. This drinking water contaminant is not considered to be a health risk by regulatory authorities, but it does have a negative aesthetic impact on the overall quality of drinking water. The adverse aesthetic impacts typically include staining of household plumbing fixtures, water discoloration, staining of laundry, plugging of water supply piping systems, and unpleasant taste and/or odors.

It is not mandatory that water utilities remove dissolved manganese from the potable water supply. However, with the levels that are present in the water pumped from the City's supply wells, all of the above problems have or will likely be experienced at some point by the Water Utility's customers.

The drinking water supply wells that the City of Silver Lake operates are high in naturally-occurring dissolved iron, manganese and are also high in ammonia. The recent dissolved manganese level in the water pumped from Well 2 was measured at 0.108 milligrams per liter (mg/l). This concentration is more than 2 times the EPA Secondary Drinking Water Standard for manganese of 0.05 mg/l. The dissolved iron level at Well 2 was also tested. The iron level at Well 2 tested above the Secondary Drinking Water Standard of 0.30 mg/l, with an average level of 0.89 mg/l. This amount of iron is almost three times the EPA Standard. The water pumped from the City of Silver Lakes wells is also high in natural ammonia which causes problems with the disinfection process by forming disinfection by-products. The level tested was 1.06 mg/l. The presence of ammonia in water limits the amount of chemicals and methods that may be used to oxidize the minerals in the water.

While dissolved iron and manganese is normally easier to remove than other problematic groundwater minerals such as calcium or magnesium (hardness components), it is more difficult to remove than dissolved iron. Typical treatment processes used to remove dissolved iron and manganese include chemical oxidation with aeration, chlorine addition of potassium permanganate ($KMnO_4$), followed by filtration through specially prepared filter media designed for effective iron and manganese removal.

1.1 Pilot Study Water Sources

The source of supply for the pilot study was obtained from City Well 2 which is located behind the Fire Station along Main Street. During the pilot test the well was operated continuously at a 50 gallons per minute (GPM) rate. Table 1 summarizes the water quality data recorded at each water source at the time of the pilot testing.

Table 1
Existing Raw Water Quality

Iron mg/l			Manganese mg/l		
Min	Max	Average	Min	Max	Average
0.79	0.99	0.90	0.097	0.125	0.11

1.2 Pilot Study Objectives

The EPA National Secondary Drinking Water Standard recommendations for the concentration of iron and manganese in potable water supplies are 0.30 mg/l and 0.05 mg/l, respectively. The average levels of dissolved iron recorded from the well was about three times the recommended maximum level, but the average observed level of dissolved manganese at Well 2 was over 2 times the recommended level. The City of Silver Lake may find it desirable to reduce the iron and manganese levels to ensure problem-free water for the consumer.

The goals of the pilot studies were as follows:

- Evaluate treatment processes that will reduce dissolved iron and manganese levels to a point below the secondary standard.
- Evaluate the effectiveness of different filtration media and filtration rates for the removal of dissolved iron and manganese from the well water supply.
- Determine the optimum method to oxidize dissolved iron and manganese for effective removal of the precipitated minerals by filtration.
- Determine the treatment parameters for maintaining a filter run duration of greater than 20 hours.

2.0 Pilot Testing Processes and Equipment

2.1 Pilot Testing Processes

The pilot study was conducted to establish the efficiency and reliability of the process best suited for the treatment of the City of Silver Lake water supply. Based on the concentrations of minerals in the water and on extensive prior water treatment experience, the cost-effective treatment processes selected for the pilot study included oxidation and filtration.

2.2 Pilot Testing Equipment

2.2.1 Chemical Feed System

The chemical feed systems used in the Silver Lake pilot testing were Stenner Perastaltic metering pumps capable of feeding 0.2 gallons per day (gpd) up to 50 gpd. The pumps were set up to feed less than 5 gpd for this study. The treatment chemicals used were mixed and fed from 5 gallon solution tanks.

2.2.2 Filters

A total of four filters, each with a diameter of 8 inches by 72 inches tall were used during the pilot testing. Each filter vessel has a ¾ inch diameter inlet, 1½ inch diameter backwash waste outlet, under drain system, air release system, rate of flow meters, sample taps, and filter media. Each filter column provides 0.35 square feet (ft^2) of surface area per column. When the filters are operated at 2-gpm/ft^2, each column has an equivalent water flow rate of 0.7 GPM applied. The filters were operated in a parallel flow pattern; two columns were bedded with 18 inches of greensand filter media, and 12 inches of anthracite (Columns 2 thru 4). Column 1 and 3 were bedded with 18 inches of silica sand and 12 inches of anthracite media. Filtration flow rates through the columns were varied throughout the duration of the testing to determine the optimum value.

Pressure gauges were located on the inlet and outlet pipe of each filter column to obtain filter head loss across each column. Prior to starting the filter runs, each column was backwashed to remove fines and to clean the media. The greensand filter media was saturated with a solution of potassium permanganate to fully charge the filter media material. Before operation, the greensand filter columns were backwashed again to remove excess permanganate.

Table 2 summarizes the filter media type and size used during the pilot testing:

Table 2
Filter Media Size
(millimeters)

Column 1		Column 2		Column 3		Column 4	
Silica Sand	Anthracite	Greensand	Anthracite	Silica Sand	Anthracite	Greensand	Anthracite
0.45 - 0.55	0.8 - 1.2	0.35	0.8 - 1.2	0.45 - 0.55	0.8 - 1.2	0.35	0.8 - 1.2

2.2.3 Detention Tank

The detention tank used for the pilot study is constructed of PVC material and has a total volume of 150 gallons. When the tank was operated with a flow of 5 GPM, the approximate raw water detention time was 30 minutes. The tank is constructed with baffles that provide an over and under flow pattern to prevent short circuiting of the tank. The suction of the water transfer pump is constructed with a variable suction height that can allow a detention time of less than 30 minutes.

2.2.4 Aeration

The use of aeration was evaluated during the pilot testing performed. Induced-draft aeration (with detention) was used as a part of the pilot process.

3.0 Pilot Study Operation

The water quality analyses performed on the raw water from Well 2 indicated an average dissolved manganese level of 0.11 mg/l. SEH's extensive past pilot testing experience on numerous Midwestern groundwater supplies indicates that the needed aeration level is approximately the same level as the dissolved iron concentration of the raw water, and the potassium permanganate dosage is typically double the dissolved manganese level. If chlorine is used for the oxidation of iron the dosages are approximately a 1:1 ratio. The potassium permanganate solution used during the Silver Lake pilot testing was mixed using 3 grams of potassium permanganate per liter of distilled water.

The pilot test run on Well 2 raw water was conducted using the following processes and flow patterns:

- Aeration
- Chlorine feed
- Detention
- Potassium Permanganate feed
- Filter loading flow rate: 2 and 3-gpm/ft^2

The processes used were varied in different combinations to determine the optimum approach to be used at each well for effective treatment of the raw water supplies.

4.0 Pilot Testing Sampling and Analysis

Field water quality sampling and testing of the raw water was conducted before each filter run. Field tests of the filter effluent were conducted hourly for iron and manganese levels in the treated water.

Tests for manganese levels were performed using a Hach digital colorimeter Model 2010. The water pH levels were obtained using a Hach probe pH meter. The chemical feed systems were monitored using calibration

cylinders on each of the chemical feed systems to measure the amount of chemicals fed per hour for each treatment train.

5.0 Pilot Test Results

5.1 Pilot 1 - Well 2

The pilot test run for Well 2 was conducted during late June using aeration, up to 30 minute detention, potassium permanganate addition (prior to filtration), and filtration using two different types of filter media: silica sand/anthracite media, and greensand/anthracite media. Another set of filter columns were tested using no aeration and detention. Filter flow rates were varied but operated at an overall average rate of 2 gpm/ft^{2}on two filter columns and 3- gpm/ft^2 on the other two filter columns. Use of aeration and detention was varied throughout the pilot testing. Table 3 summarizes the range of chemical feed dosages recorded during the pilot testing of Well 15.

Table 3
Chemical Dosages (mg/l)

Column 1 and 2 No Detention						Column 3 and 4 with Detention					
Chlorine			Permanganate			Chlorine			Permanganate		
Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
4.286	6.087	5.6209	0.132	0.481	0.3615	1.443	1.763	1.5545	0.11	0.369	0.2792

The finished water quality recorded during the Well 2 pilot test was well below the EPA secondary standard of 0.3 mg/l for iron and 0.05 mg/l for manganese. Figures 1 through 4 graphically illustrate the treated water quality of Well 2 water throughout the duration of the Well 2 pilot testing. Tables 4 and 5 summarize the finished water quality data for the Well 2 pilot test.

Table 4
Finished Water Quality No Detention (mg/l)

Column 1						Column 2					
Iron			Manganese			Iron			Manganese		
Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
0.01	0.16	0.0612	0.001	0.08	0.0169	0.01	0.11	0.0468	0.001	0.08	0.0169

Table 5
Finished Water Quality with Detention (mg/l)

Column 3						Column 4					
Iron			Manganese			Iron			Manganese		
Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
0.01	0.18	0.0623	0.001	0.115	0.0371	0.01	0.08	0.035	0.001	0.102	0.035

Columns 3 and 4 were operated with 30 minutes of detention before filtration. The results do not warrant the construction of a detention tank in the flow pattern.

Filter run length duration was deemed acceptable; all four columns terminated on filter head loss rather than breakthrough of either iron or manganese.

6.0 Pilot Study Conclusions

The water from Well Number 2 exceeds the standards set by the EPA and the Minnesota Department of Health for both iron and manganese the levels of both can be reduced to levels well below the secondary standards by normal oxidation with permanganate and filtration on granular media.

6.1 Iron

The dissolved iron in the water pumped wells was easily oxidized using aeration and permanganate and removed using any of the filter media tested. Chlorine will cause the iron to increase when used because of the ammonia in the water. Chlorine may be used at dosages less than breakpoint to control biological fouling of the media.

6.2 Manganese

Dissolved manganese should be effectively oxidized with the use of permanganate as the preferred oxidant for manganese removal treatment. It is recommended that the pre-filtration permanganate feed rate be designed at a level of approximately twice the concentration of dissolved manganese in the raw well water. The effectiveness of aeration was tested and it is the recommendation not to use aeration.

6.3 Detention

The use and duration of detention prior to filtration was tested throughout the pilot. Based on the results observed in the pilot testing of both wells, the use of detention for the effective oxidation and removal of dissolved iron and manganese is not needed. Anticipated oxidation chemical costs will be marginally higher without detention, but it is not believed that this incremental treatment operational cost warrants the construction of a detention tank.

6.4 Filter Media

The effectiveness of several common water filtration media was evaluated during the pilot testing. Based on a review of the finished water quality results obtained, and an analysis of the associated chemical treatment needs, the greensand/anthracite media performance was superior. It is anticipated that greensand/anthracite media will be the most effective media used for the filtration and removal of manganese from water pumped. The recommended filtration rate is 2-gpm/ft^2. This filtration rate will allow for operating the treatment plant at a higher loading rate for short period of time during summer pumping or emergencies.

6.5 Filtration Approach

The filters needed to effectively remove iron and manganese in the source waters tested can be designed as pressure filters or as gravity filters, without significant differences in treatment operation costs. The use of ground storage in the design tends to favor the use of gravity filtration over pressure.

6.6 Filter Backwash

Backwashing of filters should include combination air-water washing, as the filter media will be better cleaned with less water used. The combination air-water backwash is anticipated to need approximately one half of the water volume used by a water-only backwash system.

The process of filter backwashing and the disposal of filter backwash water can be accomplished in several different ways. It is typically very cost-effective to recycle filter backwash water within the treatment plant, following a specified settling period in a backwash tank. Recycling filter backwash water is cost-effective, as the treatment plant uses less water for operation, and less water is wasted and disposed to the sewer system. The Minnesota Department of Health allows a maximum backwash water recycle flow to the filters of 10 percent of the total plant treatment flow capacity.

List of Figures

Figure 1
City of Silver Lake, Minnesota
Raw Water Quality

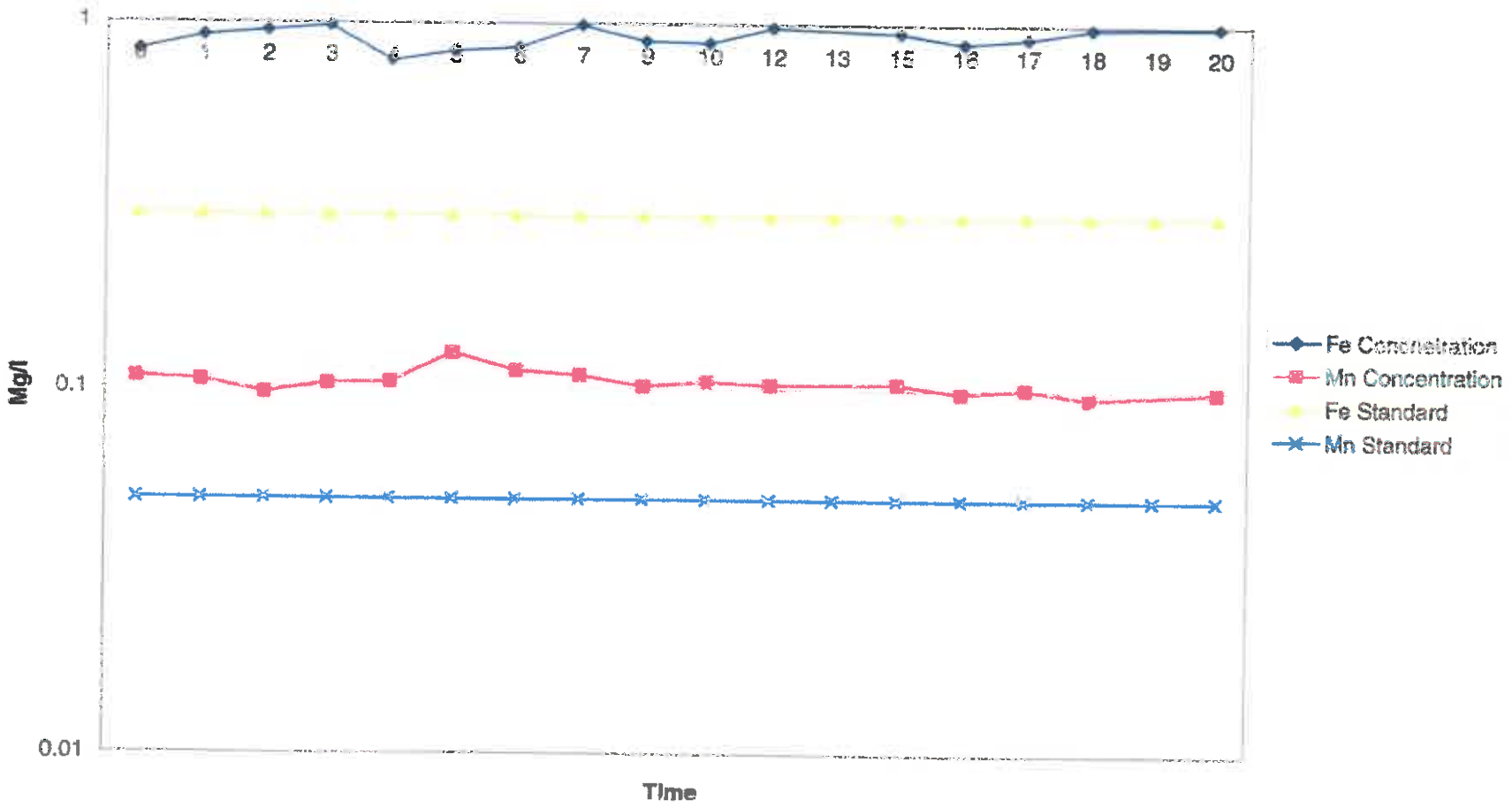


Figure 2
City of Silver Lake, Minnesota
Finished Water Quality
Column 1, Silicasand/Anthracite Media
3 GPM/Sq Ft Filter Rate

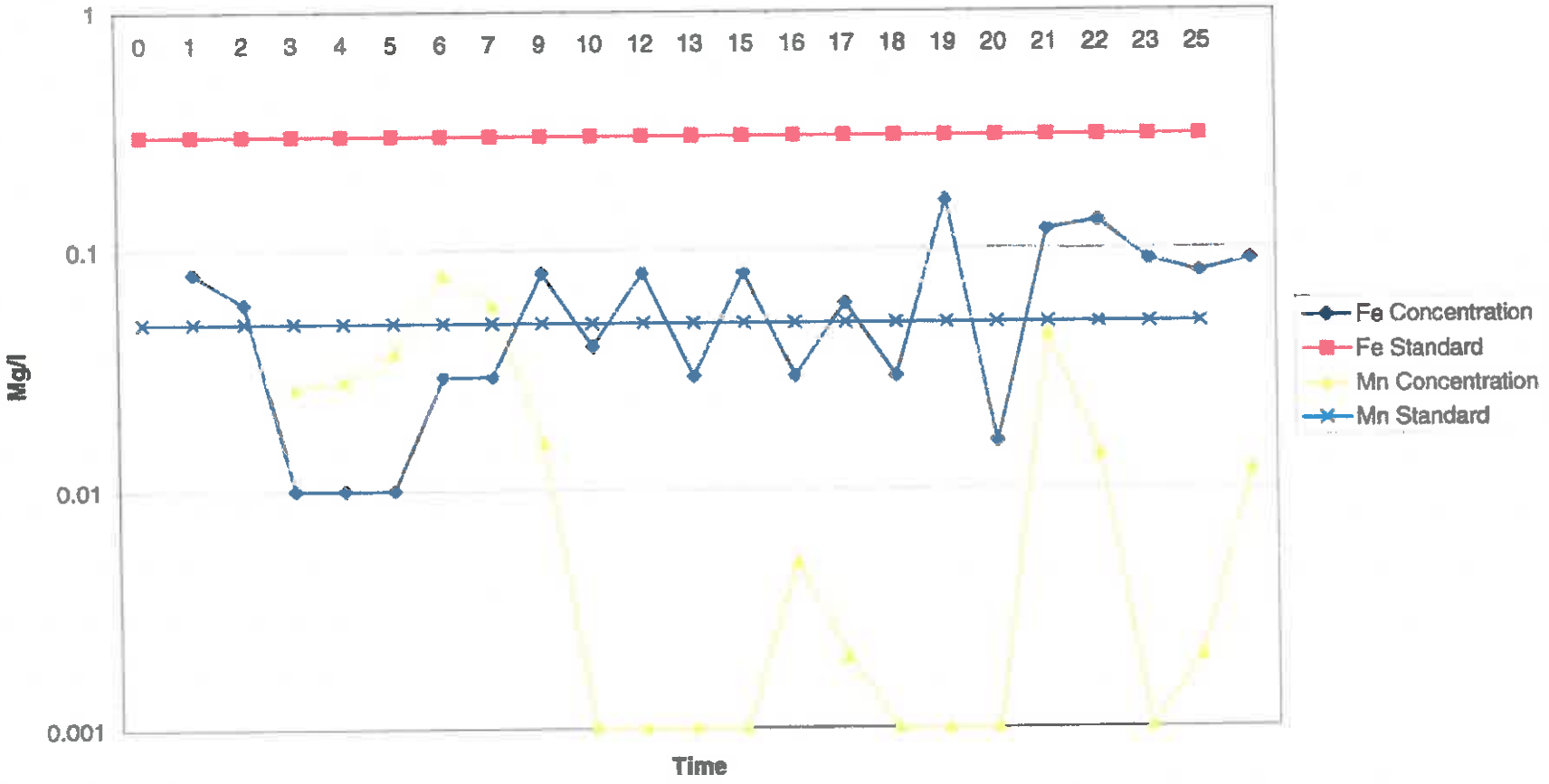


Figure 3
City of Silver Lake, Minnesota
Finished Water Quality
Column 2, Greensand/Anthracite Media
3 GPM/Sq Ft Filter Rate

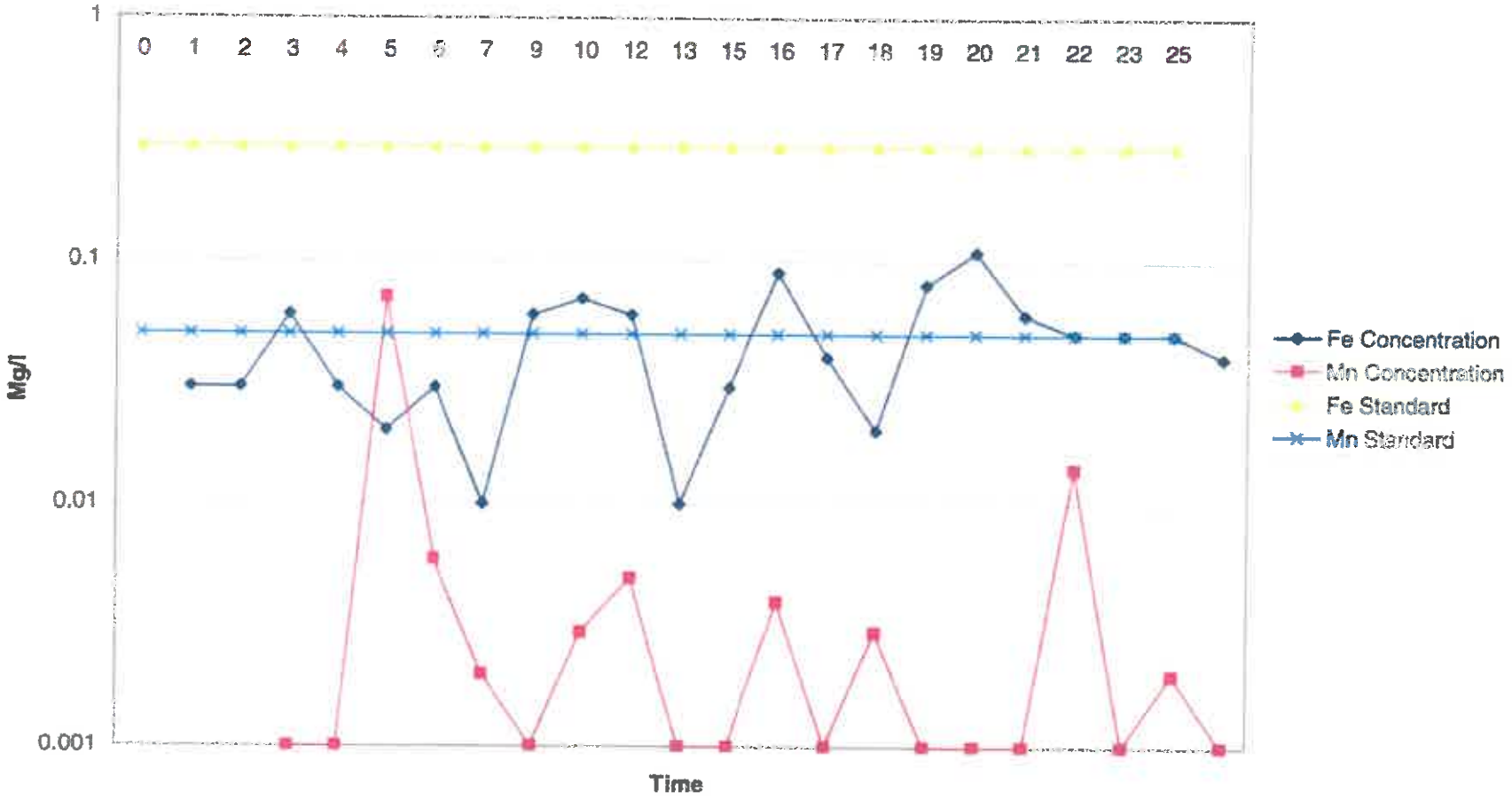


Figure 4
City of Silver Lake, Minnesota
Finished Water Quality
Column 3 Greensand/Anthracite Media with Detention
3 GPm/Sq Ft Filter Rate

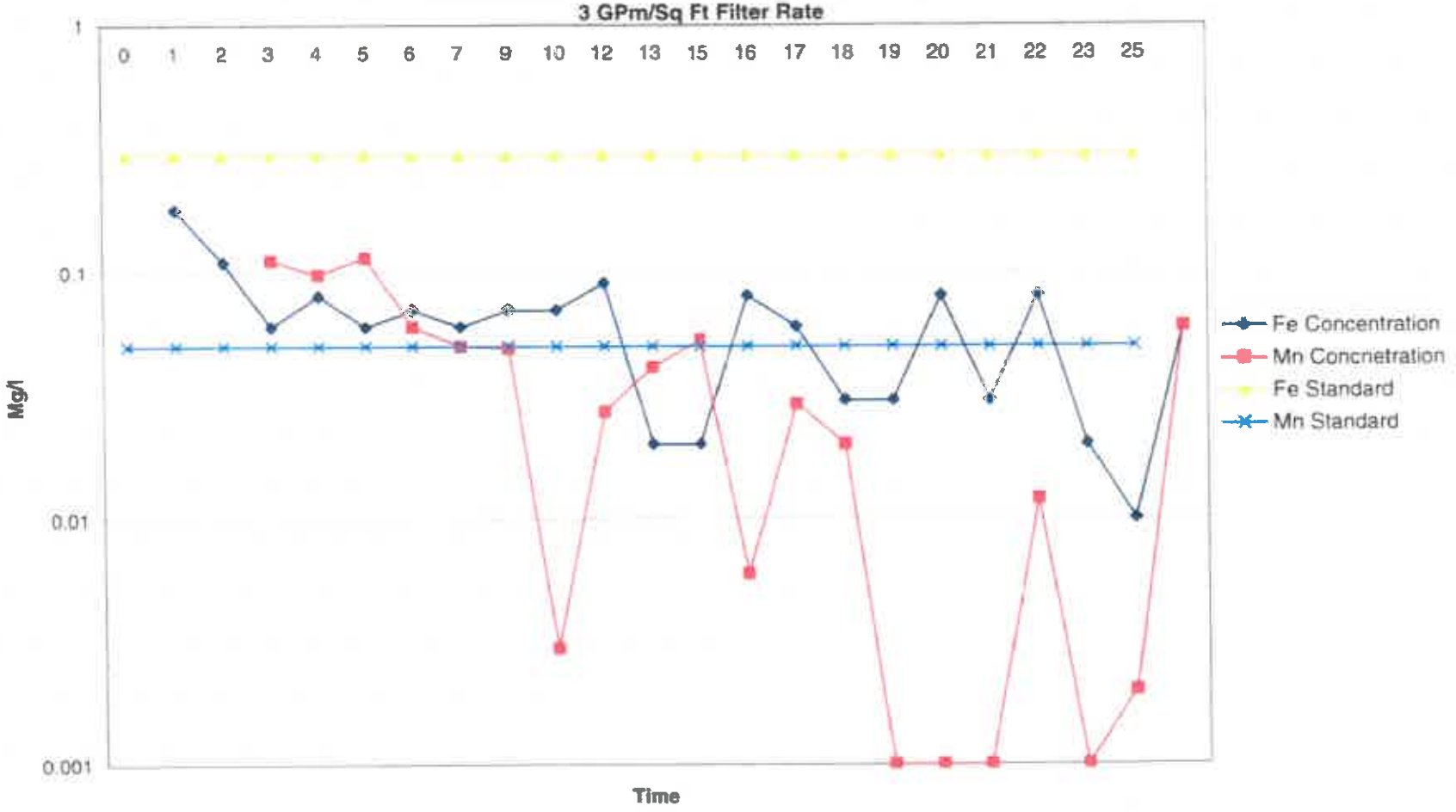


Figure 5
City of Silver Lake, Minnesota
Finished Water Quality
Column 4, Greensand/Anthracite Media with Detention
3 GPM/Sq Ft Filter Rate

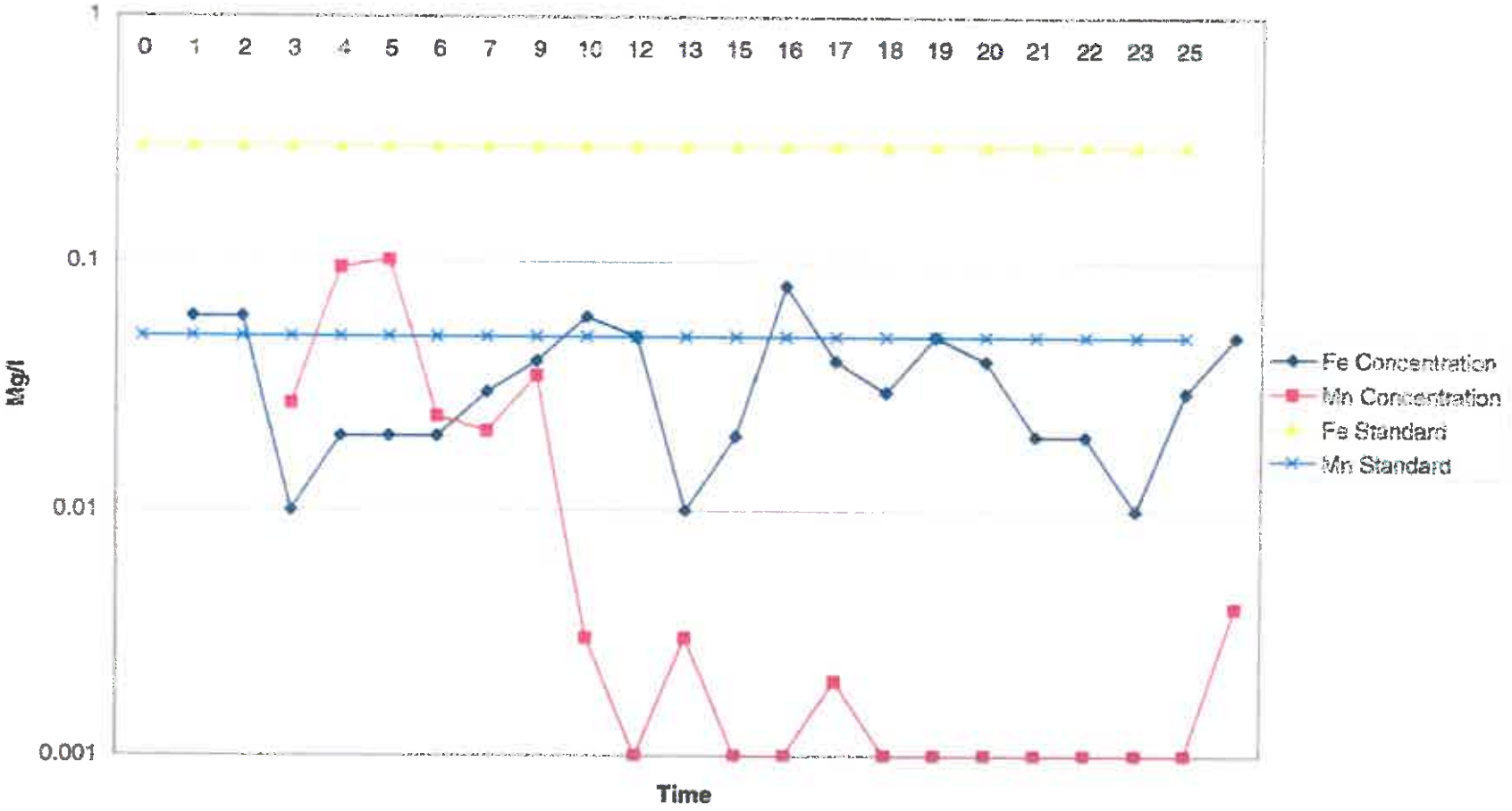


Figure 6
City of Silver Lake, Minnesota
Column 1 Headloss Curve
Silicasand/Anthracite Medis
3-GPM/sq Ft

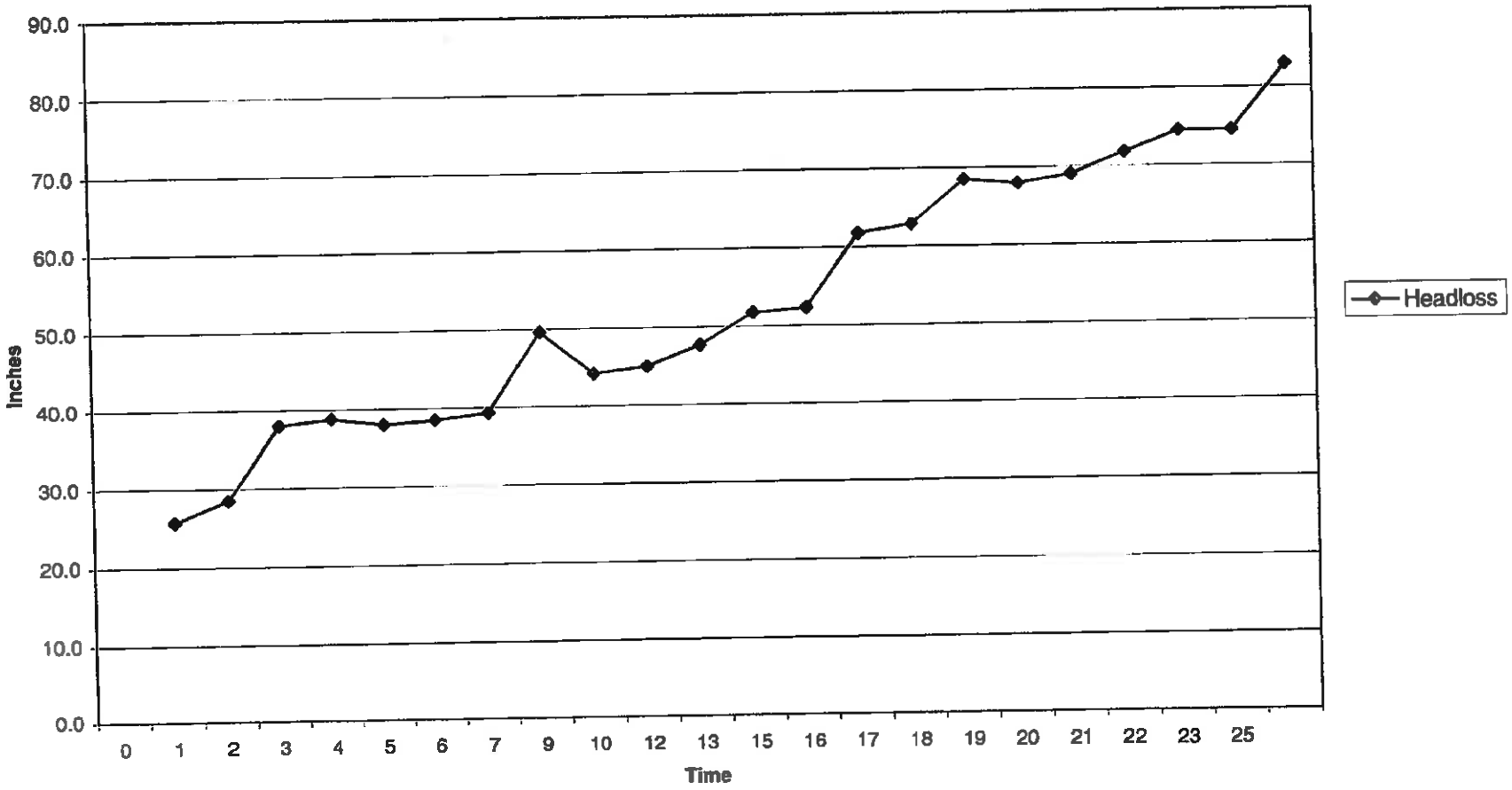


Figure 7
City of Silver Lake, Minnesota
Column 2, Headloss Curve
Greensand/Anthracite Media
3-GPM/ Sq Ft Filter Rate

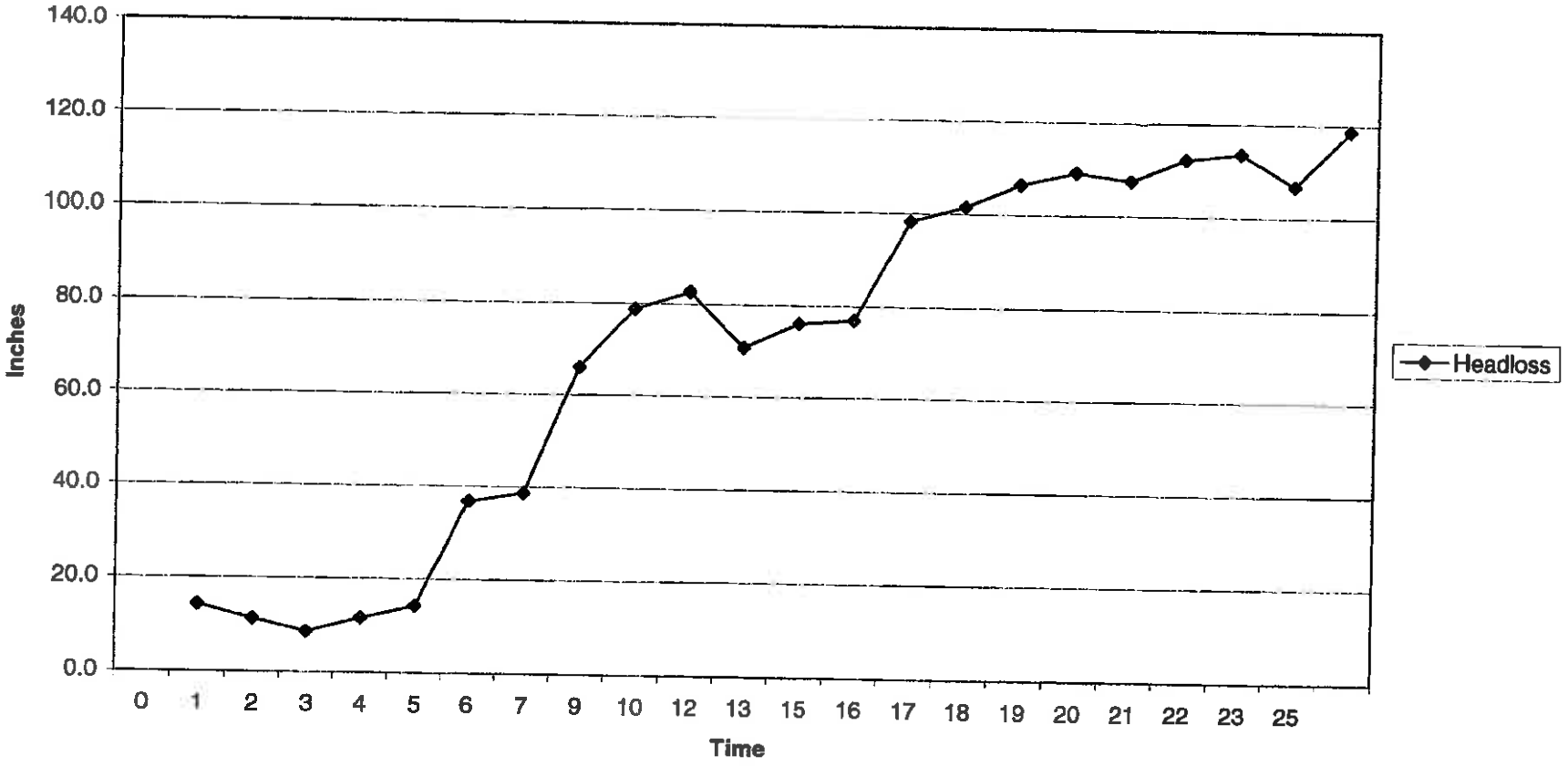


Figure 8
City of Silver Lake, Minnesota
Column 3, Headloss Curve
Silicasand/Anthracite Media with Detention
3-GPM/ Sq Ft Filter Rate

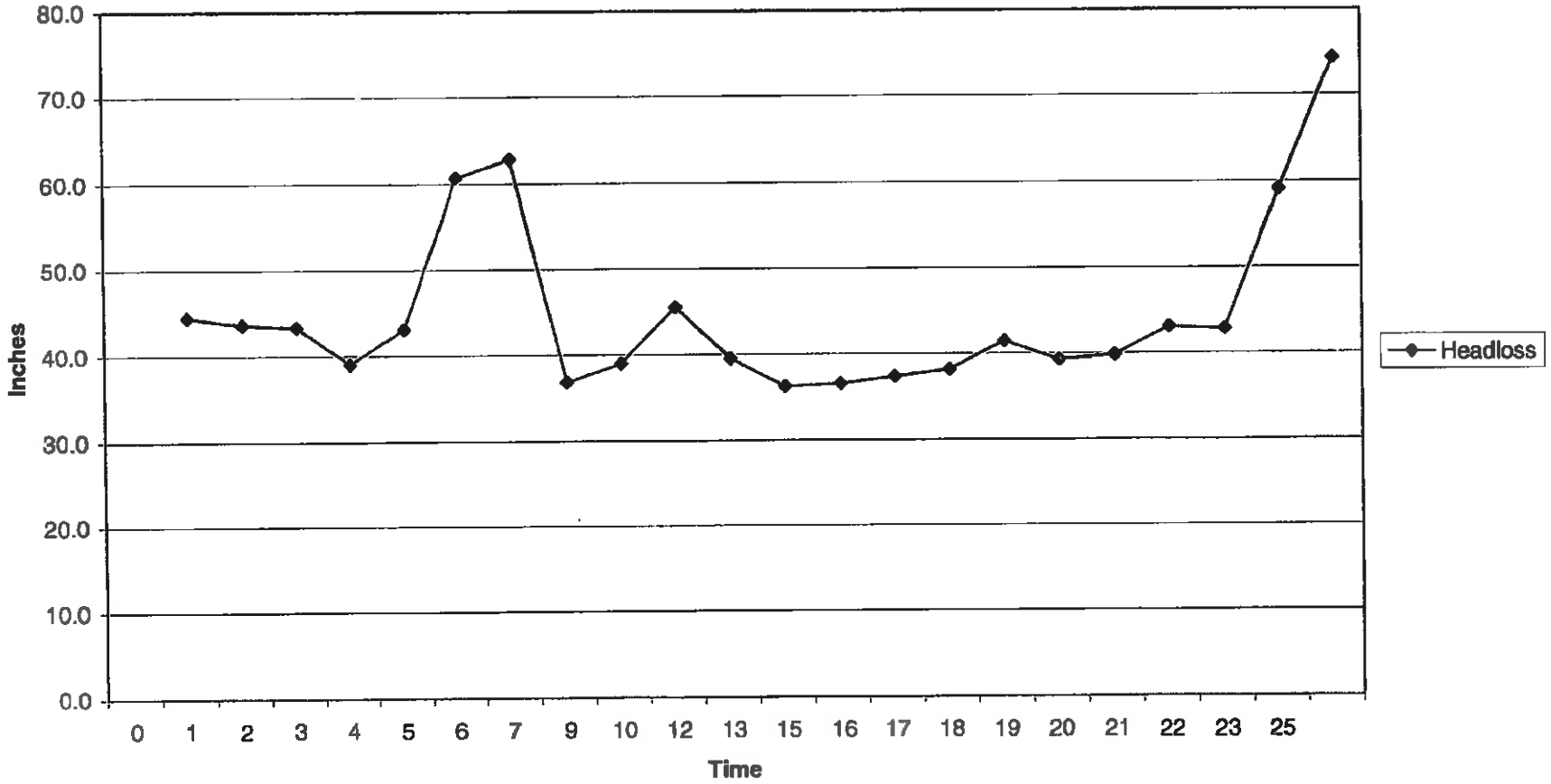
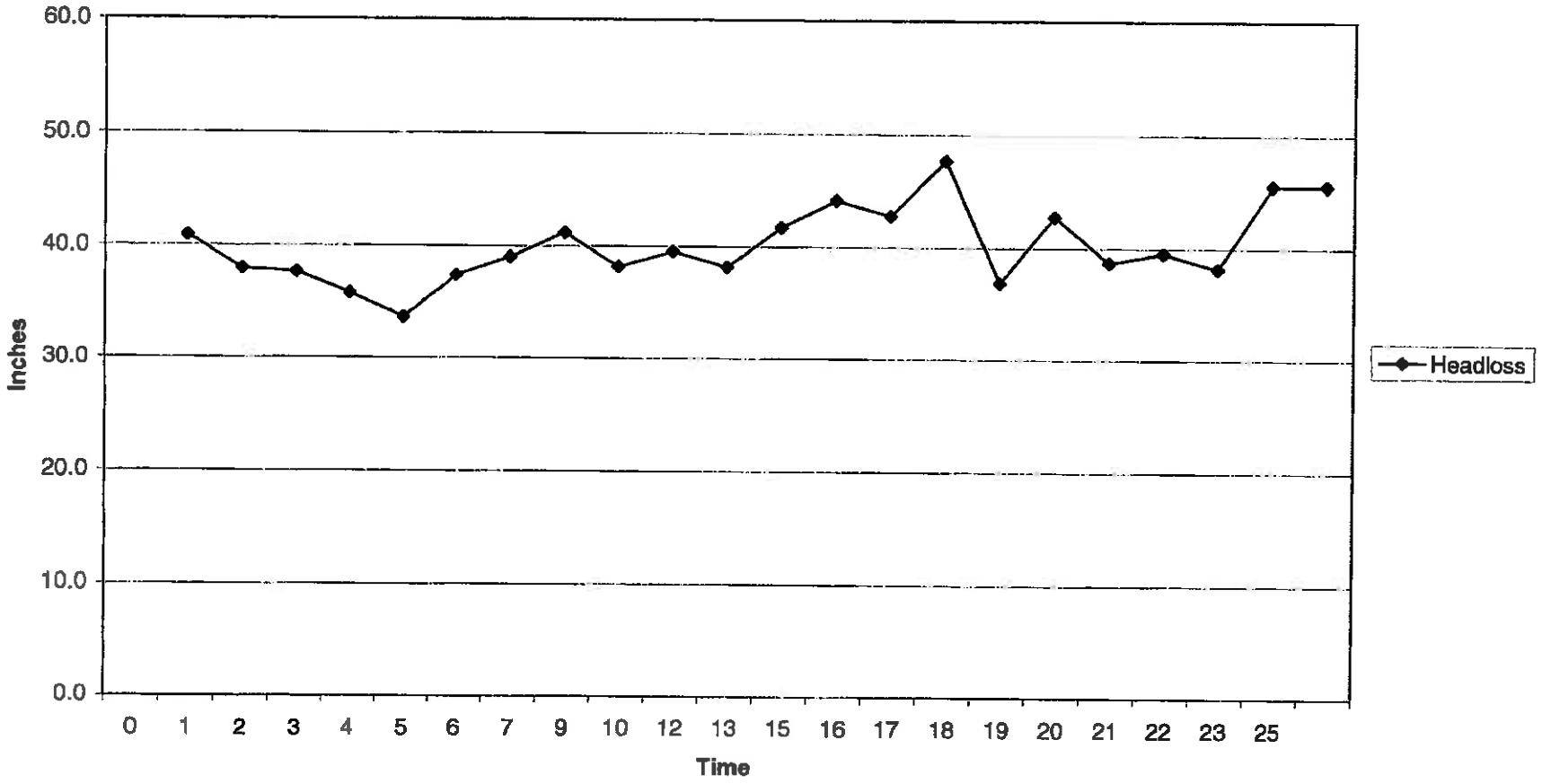
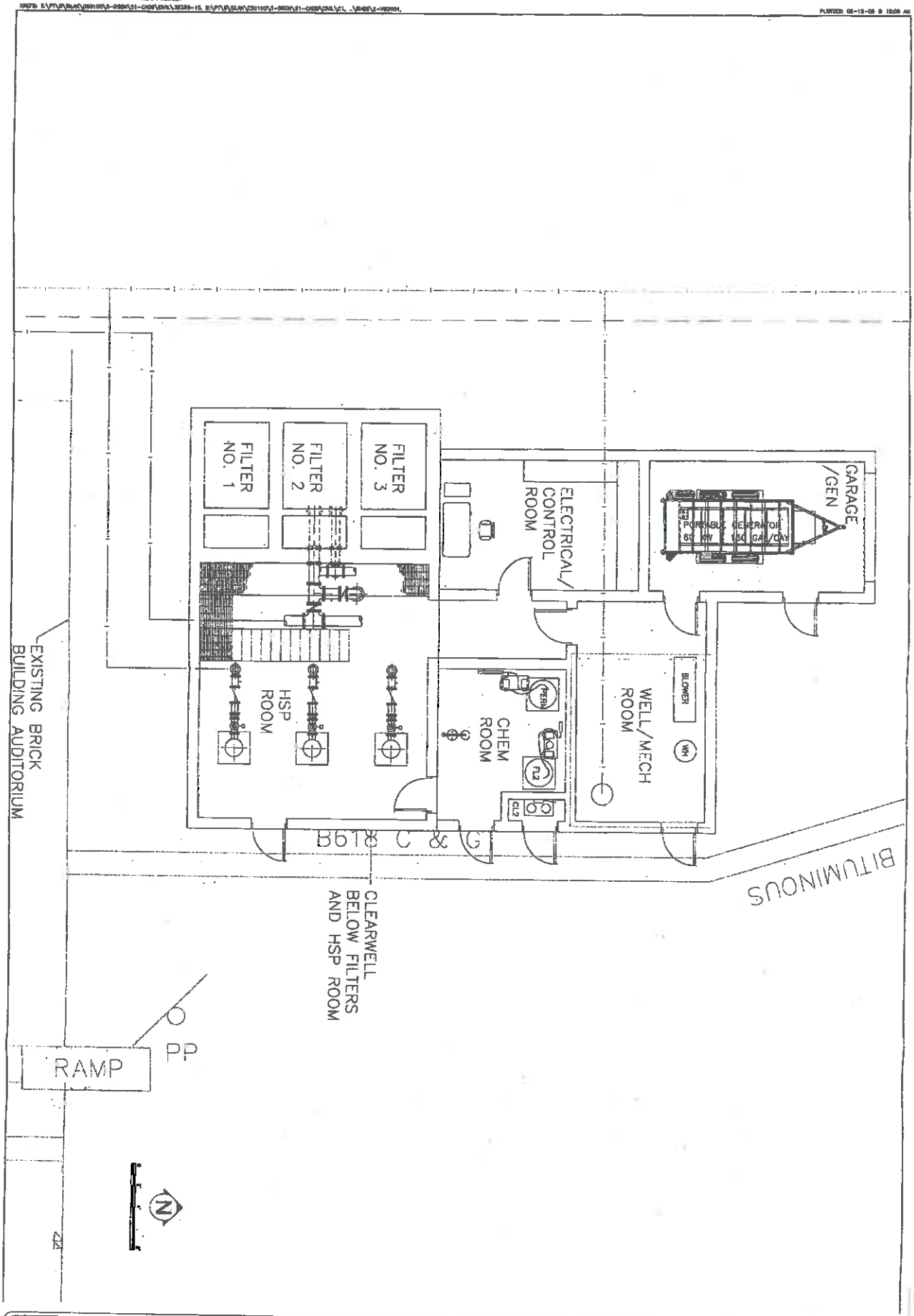


Figure 9
City of Silver Lake, Minnesota
Column 4 Headloss Curve
Greensand/Anthracite Media with Detention
3-GPM/ Sq Ft Filter Rate



Appendix A

Preliminary Layout and Cost Estimate for Gravity WTP



SHEET P1-D	SHEET TITLE: PROCESS DRAWING FLOOR PLAN GRAVITY FILTERS	SEH FILE NO. ASLAK05C1.00 PROJECT NO. ISSUE DATE AUG 2008 DESIGNED BY JMT DRAWN BY PRM	MARK DATE DESCRIPTION REVISIONS	PRELIMINARY WATER TREATMENT PLANT CITY OF SILVER LAKE, MINNESOTA	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	SEH

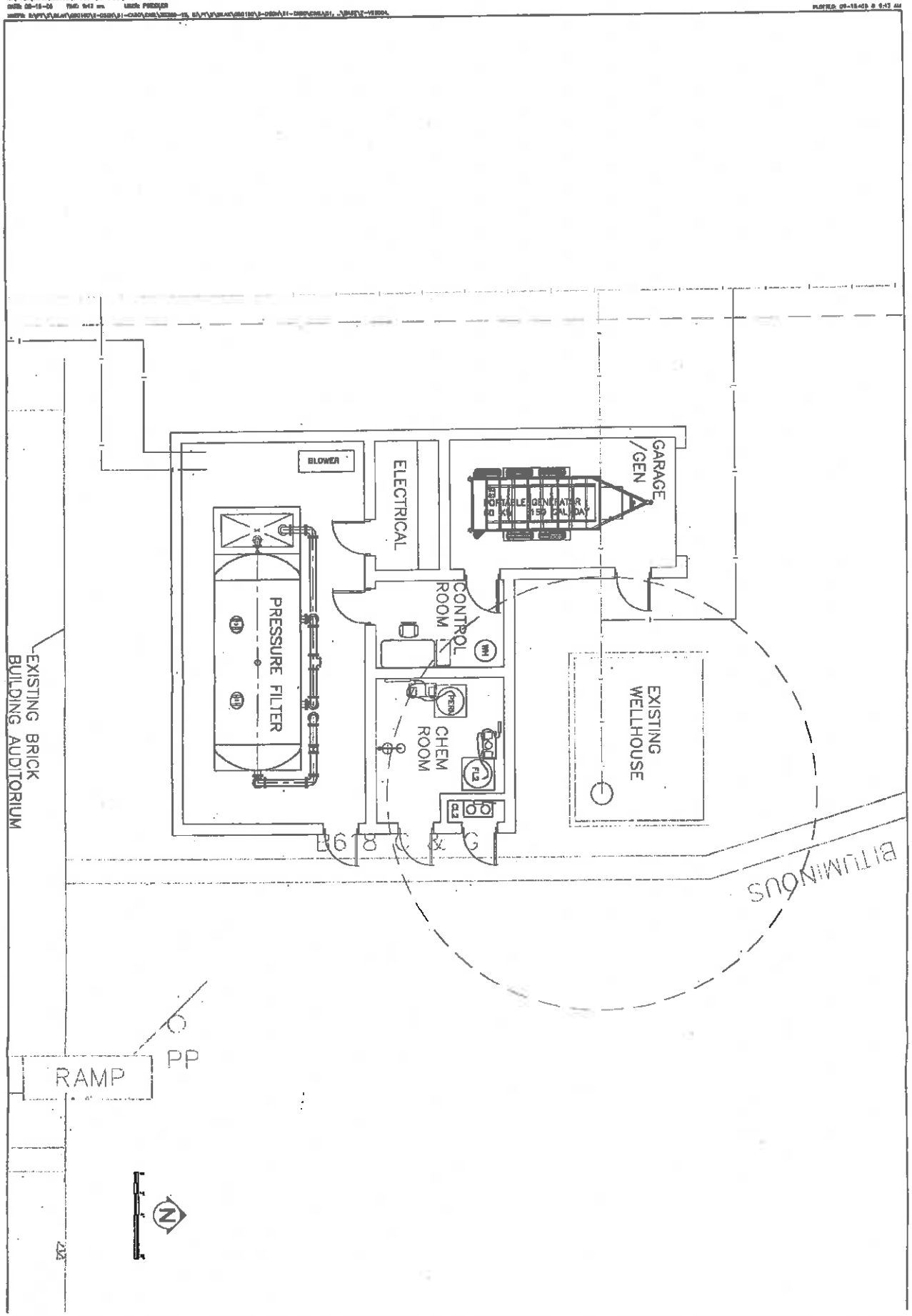
Silver Lake WTP
Preliminary Cost Estimate
8/15/2006

Backwash Tank				
20'x30'x12' deep				
	Concrete cost			$54,800.00
	2 pumps			$20,000.00
	Misc piping			$13,200.00
	Total			**$88,000.00**
Clearwell				
50,000 gal				**$104,000.00**
WTP Equip				
	Well pump and piping			$30,000.00
	H.S. split case pumps (3)			$75,000.00
	Concrete gravity filters (3)			$150,000.00
	Blower			$15,000.00
	Gas chlorine feed system			$16,000.00
	Fluoride feed system			$8,000.00
	Permanganate feed system			$10,000.00
	Genset (by Owner)			
				$304,000.00
	Total Process			**$496,000.00**
Architectural Bldg				
SF	2032		$175.00	**$355,600.00**
	Total			$851,600.00
Elect	15%			$127,740.00
Mech	10%			$85,160.00
	10 % Contingency			$85,160.00
Total Construction				**$1,149,660.00**
Engineering Fee			17%	$195,442.20
	Total			$1,345,102.20

Demolition of existing pumphouse not included
Watermain to plant not included

Appendix B

Preliminary Layout and Cost Estimate for Pressure WTP with Generator



SHEET NO. P1-E	SHEET TITLE: PROCESS DRAWING FLOOR PLAN WITH GENERATOR ROOM	SEH FILE NO. ASILAK0501.00 PROJECT NO. ISSUE DATE AUG 2008 DESIGNED BY JMT DRAWN BY PBW Short Elliott Hendrickson, Inc. © (SEH) © 2008 Short Elliott Hendrickson, Inc.	MARK DATE DESCRIPTION REVISIONS	PRELIMINARY WATER TREATMENT PLANT CITY OF SILVER LAKE, MINNESOTA	I HEREBY CERTIFY that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the state of Minnesota. Date:	SEH 3535 Vadnais Center Dr St. Paul, MN 55110 Phone: 651.490.2000 Fax: 651.490.2150 www.sehinc.com

Silver Lake WTP
Preliminary Cost Estimate
8/15/2006

Backwash Tank
20'x30'x12' deep

Concrete cost		$54,800.00
2 pumps		$20,000.00
Misc piping		$13,200.00
Total		**$88,000.00**

WTP Equip

Piiping and Misc		$30,000.00
Pressure filters		$228,000.00
Blower		$15,000.00
Gas chlorine feed system		$16,000.00
Fluoride feed system		$8,000.00
Permanganate feed system		$10,000.00
Genset (by Owner)		
		$307,000.00
Total Process		**$395,000.00**

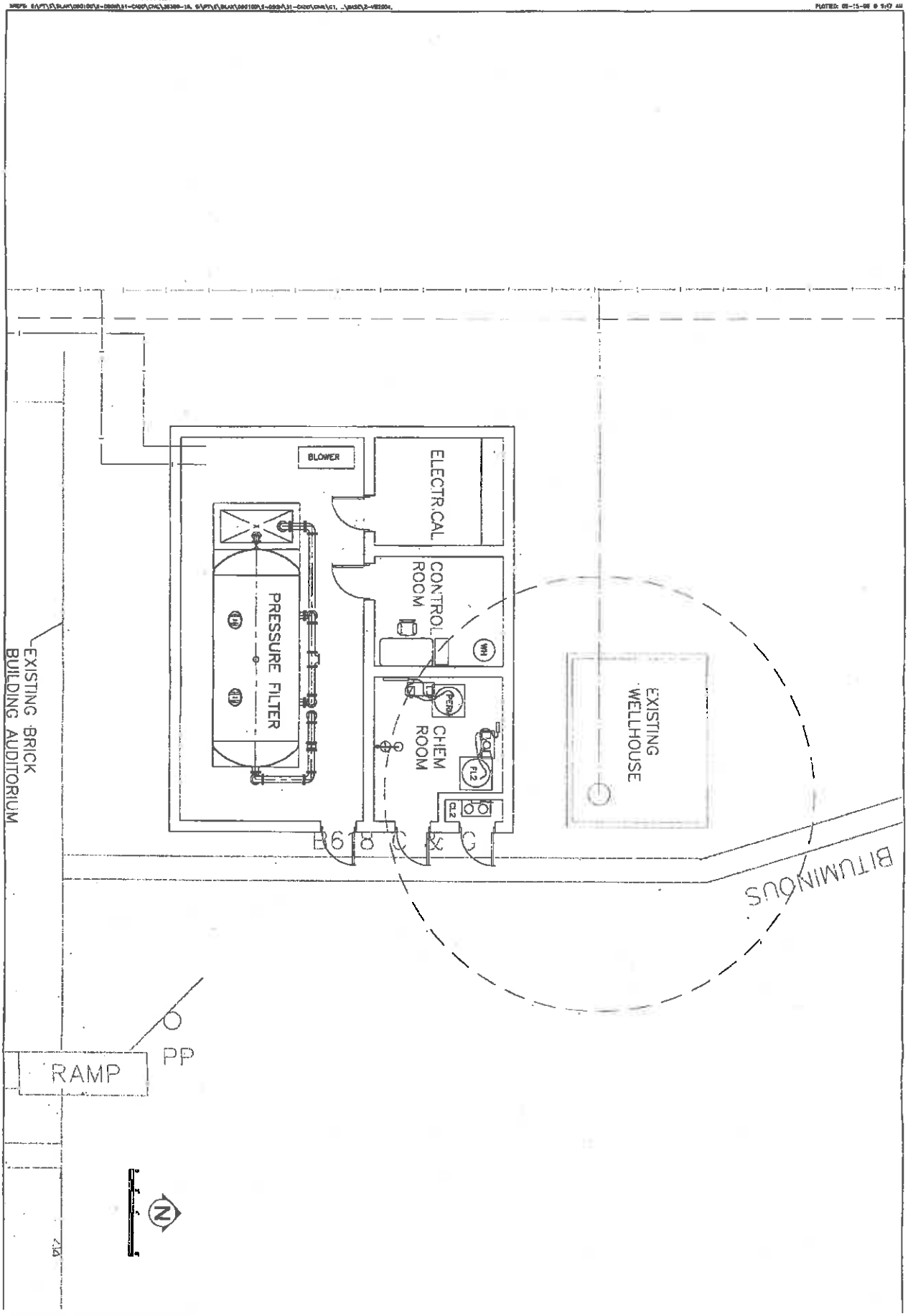
Architectural Bldg

SF	1420	$175.00	**$248,500.00**
	Total		$643,500.00
Elect	15%		$96,525.00
Mech	10%		$64,350.00
	10 % Contingency		$64,350.00
Total Construction			**$868,725.00**
Engineering Fee		17%	$147,683.25
Total			$1,016,408.25

Demolition of existing pumphouse not included
Watermain to plant not included
Add to include new wellhouse in building $65,000.00

Appendix C

Preliminary Layout and Cost Estimate for Pressure WTP without Generator



SHEET P1-F	SHEET TITLE: PROCESS DRAWING FLOOR PLAN WITHOUT GENERATOR ROOM	SEH FILE NO. ASLAK0501.00 PROJECT NO. ISSUE DATE AUG 2008 DESIGNED BY JMS DRAWN BY PRW © 2008 Short Elliott Hendrickson, Inc.	MARK DATE DESCRIPTION REVISIONS	PRELIMINARY WATER TREATMENT PLANT CITY OF SILVER LAKE, MINNESOTA	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. Date ____ REGISTRATION NO. ____	SEH

Silver Lake WTP
Preliminary Cost Estimate
8/15/2006

Backwash Tank
20'x30'x12' deep

	Concrete cost	$54,800.00
	2 pumps	$20,000.00
	Misc piping	$13,200.00
	Total	**$88,000.00**

WTP Equip

	Piiping and Misc	$30,000.00
	Pressure filters	$228,000.00
	Blower	$15,000.00
	Gas chlorine feed system	$16,000.00
	Fluoride feed system	$8,000.00
	Permanganate feed system	$10,000.00
	Genset (by Owner)	
		$307,000.00
	Total Process	**$395,000.00**

Architectural Bldg

SF	1192	$175.00	**$208,600.00**
	Total		$603,600.00
Elect	15%		$90,540.00
Mech	10%		$60,360.00
	10 % Contingency		$60,360.00
	Total Construction		**$814,860.00**
Engineering Fee		17%	$138,526.20
	Total		$953,386.20

Demolition of existing pumphouse not included
Watermain to plant not included
Add to include new wellhouse in building $65,000.00

Appendix 8

Wastewater Inspection Report

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

February 10, 2020

Mayor Dorothy Butler
City of Silver Lake
308 W Main St
Silver Lake, MN 55381

RE: Silver Lake WWTP
NPDES/SDS Permit No. MNG580164
WW Compliance Evaluation Inspection

Dear Mayor Dorothy Butler:

Enclosed is the WW Compliance Evaluation Inspection Report (Report) that resulted from an inspection of the Silver Lake WWTP (Regulated Party) on June 17, 2019, by Chandi McCracken-Holm and Hailey Gorman of the Minnesota Pollution Control Agency (MPCA). Non-compliant requirements identified at the time of inspection are listed on page 3-12 of the Report

Corrective actions and deadlines are listed on page 13 of the Report.

Please be aware, this correspondence does not preclude the MPCA from taking further action in response to non-compliance identified.

If you have any questions, please contact me at 651-757-2232 or 800-657-3864 and by email at chandi.mccracken-holm@state.mn.us.

Thank you for your attention to this matter.

Sincerely,

Chandi McCracken-Holm

This document has been electronically signed.

Chandi McCracken-Holm
Environmental Specialist
Industrial Division

CMH:ss

Enclosure

cc: Lee Ortloff, Silver Lake WWTP (w/enclosure)
Jeremy Anderson, Silver Lake WWTP (w/enclosure)
Mark Hugeback, MPCA (w/enclosure)
Activity ID INS20190001 @ 1192

MINNESOTA POLLUTION CONTROL AGENCY

Water Quality Point Source Program

WW Compliance Evaluation Inspection Report

Facility information:
Facility name: Silver Lake WWTP
Permit number: MNG580164
Address: 8705 210th St, Silver Lake, Minnesota 55381
SIC code: 4952 - Sewerage Systems
Permit expiration date: 08/31/2015
Facility design flow: 0.139 mgd (AWW)
EPA facility type classification: EPA Minor
Type of flow: Domestic
Land application type: none

Geographic information:
MPCA region: MPCA Southwest Region
County: McLeod
Basin: Upper Mississippi River, Upper Portion
Major watershed: South Fork Crow River
Receiving water: Otter Creek

Those present during the inspection:
Lee Ortloff, Operator, People's Service
Jeremy Anderson, Operator, People's Service

MPCA representatives:
Chandi McCracken-Holm, Environmental Specialist
Hailey Gorman, Environmental Specialist

Inspection information:
Inspection date: June 17, 2019
Inspection category: Routine Inspection
Inspection type: WW Compliance Evaluation Inspection

Facility components:
- Primary treatment - primary stabilization pond
- Secondary Stabilization Pond

Treatment plant operators:

First Name	Last Name	Class Name	Day of Expiration Date
Jeremy	Anderson	C	1-Nov-21
Lee	Ortloff	A	1-Jul-22

Facility contacts:

Name	Relationship	Phone	Email
Lee Ortloff	is Online Subscriber for is 24-Hour emergency contact-Primary for	612-636-2434	lortloff@peopleservice.com
Jon Jerabek	is Wastewater Billing Contact for is billing contact for is responsible official for	320-327-2412	silver.lake.mn@mchsi.com
John Rodeberg	is contractor for	320-327-2412	jrodenberg@sehinc.com
Jeremy Anderson	is Online Subscriber for	320-223-2034	janderson@peopleservice.com

Silver Lake WWTP Inspection Summary
Inspection/Records Review Timeframe: June 1, 2014 to January 31, 2020

A WW Compliance Evaluation Inspection was conducted on June 17, 2019 by Chandi McCracken-Holm and Hailey Gorman of the Minnesota Pollution Control Agency (MPCA) to determine the compliance of Silver Lake WWTP (Regulated Party) with the terms and conditions of its National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit.

Key: A = Advisory C = Compliant NC = Non-Compliant NI = Not Inspected NA = Not Applicable

Compliance status	Requirement and notes
	Overall physical condition of the plant
	Comments: The overall condition of the facility was in moderate condition. The control structure for SD001 was leaking, however plans were already made to insert a valve along the pipe use for discharge and stop further leakage. A bail was placed in the pipe at the time of the inspection to prevent further leakage until the fix was completed. The replacement valve location was approved by the MPCA engineer and has since been put in place. The control structure between ponds 1 and 2 does not function. There is build up on the east side of the south east pond from trucked in sewage addition to the pond over many years. There was adequate fencing and signage. No rodent burrows noted during the inspection.
☒NC ☐C ☐A	**Adequate Operation & Maintenance to achieve permit compliance** • **Certified Operators:** Lee Ortloff (class A) and Jeremy Anderson (class C) • **Maintenance schedule - daily, weekly, and monthly**
	Comments: The control structure between ponds one and two has not been working for some time. There should be flexibility in facility operation if treatment becomes ineffective and operational changes are required. MPCA advises that a fix is completed to allow the facility to operate as designed. The grass on the dike is only cut twice per year and bailed. This is not frequent enough to ensure that deep rooted vegetation does not grow or allow for adequate observation of burrowing animals or sloughing of the dikes. 

There was vegetation and trees growing in the rip rap that must be removed to prevent dike failure and pond leekage as well ensure that rodent activity is visible. There was also deep rooted vegetation such as cattails or reeds in the pond that must be removed.

Southwest pond

Southwest pond

Southeast pond

☐NI ☐NA | **Inflow & Infiltration (I&I)/collection system**

- **Number of lift stations:** 3
- **Alarm System:** Omnisite
- **Inspection/cleaning program frequency:**

Comments: As demonstrated in the flow data, inflow and infiltration is a serious concern since the pond has been operating above design flow for several years. At the inspection, MPCA was told that smoke testing was completed in the collection system and Main street was jetted. A few connections to the sanitary were found and disconnected or filled with rock to prevent flow. MPCA recommends that this type of fix is verified that it is stopping all flow and is a permanent fix. If high flows continue, there is a possibility that any requests for sanitary sewer extensions will be denied.

The city should continue to make the removal of clear water infiltration and inflow (I&I) from the sanitary collection system a priority. The influent flow to the facility has not stayed within the systems design capacity to ensure effective operation. To protect city assets and minimize operation costs, the city, if one does not exist already, should develop and enforce a sump pump ordinance, which prohibits property owners from discharging footing tile, sump pumps, roof drains and ground water into the sanitary sewer.

Much like a sump pump ordinance, the MPCA also encourages the city to develop a process to address I&I from individual service laterals if this has not been completed yet. In 2018, the League of MN Cities recently released a new model ordinance to help cities keep clean water out of the city's sanitary sewer systems. The ordinance prohibits the discharge of clean water into the sanitary sewer system from defective plumbing and defective sewer service laterals. The ordinance also allows cities to develop an inspection program (citywide or at point of sale only), require corrections by property owners, and assess penalties for violations and issue certificates of compliance to the property owner upon completion. Model ordinances should be customized as appropriate for an individual city's circumstances in consultation with the city's attorney.

In addition to development and enforcement of sump pump and service lateral ordinances to reduce I&I from entering the collection system the following links will provide guidance to

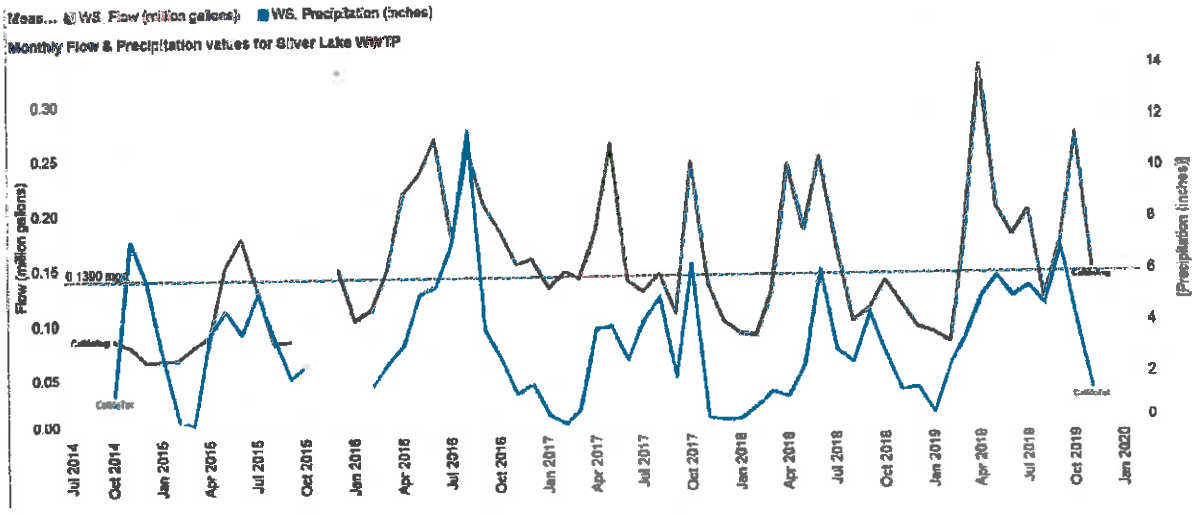
the development of an I&I plan, which may be required with your next permit reissuance, but is recommended by MPCA regardless of permit status:

A LMC model ordinance for regulation to prevent clear water from entering the sanitary sewer system through sump pumps, defective plumbing, and defective sewer service laterals https://www.lmc.org/media/document/1/inflowandinfiltrationmodel.docx?ssl=true

A completed League of Minnesota Cities Sanitary Sewer System Assessment. The assessment can be found at http://www.lmc.org/media/document/1/modelSanitarySewerSystemAssessment.docx

A completed EPA Capacity, Management, Operation, and Maintenance (CMOM) checklist. The checklist can be found at: https://www3.epa.gov/npdes/pubs/cmomselfreview.pdf

	Flow data (compare design flow to actual flow) • **Design Flow:** .139 mgd Average Wet Weather Flow • **Actual Flow (3 yr. avg):** .155 mgd and **111% of design flow.**



Compliance status	Requirement and notes
☒NC ☐C ☐A	**Equipment calibration - Flow instrument calibration methods** • **Flow equipment (pump run times, meters, etc.)**
	Comments: Pump run time is used to collect flow data. Calibration records were only available for October 2016 and October 2017. Calibration only occurred once each year, however the permit requires that a calibration and/or check occurs twice annually.
☒NC ☐C ☐A	**Releases/Incidents prohibited**
	Comments: The release of wastewater is prohibited. Eleven releases have occurred over the last 5 years, however there have only been 3 over the past 3 years. Some of these releases were due to wet weather events. Continued work on I&I may help, while continued maintenance, repair and updating of the collection system as well as additional care during digging projects should help prevent releases as well.

Incident date	Incident id	Incident type description	Amount released
7/28/2019	190855	Release - Collection System - Dry Weather	<500 gallons
6/14/2018	186914	Release - Collection System - Dry Weather	<100 gallons

Incident date	Incident id	Incident type description	Amount released
10/3/2017	105563	Release - Collection System - Wet Weather	~90,000 gallons estimate
8/30/2016	101959	Release - Collection System - Wet Weather	~54,000 gallons estimate
8/17/2016	101802	Release - Collection System - Dry Weather	Unknown
8/11/2016	101746	Release - Collection System - Wet Weather, Release - Basement Backup	14,000 gallons
7/23/2016	101491	Release - Basement Backup	3,500 gallons
6/12/2016	100997	Release - Facility - Wet Weather	57,400 gallons
6/22/2015	185107	Spill or Release	18,000 gallons
2/16/2015	185015	Release - Basement Backup, Spill or Release	4500 gallons
1/24/2015	185019	Release - Basement Backup, Spill or Release	300 gallons

Compliance status	Requirement and notes
☐NC ☐C ☒A ☐NA	**Release follow-up:** • **Take all reasonable steps to immediately end release** • **Notify Duty Officer immediately:** Duty officer reports should be submitted as soon as possible. Of the 11 releases within the review period, 7 were submitted within about an hour, however the there was one that was not reported for 25 days and another that took 10 hours. See table below. Unless there is no way to make the call due to lack of resources while trying to stop and contain the release the Duty Officer should be called immediately. Even if not all information is available, a follow up/supplemental call can be made to update the Duty Officer with more details. • **Recover as rapidly and thoroughly as possible**
☐NC ☐C ☒A ☐NA	**Release sampled and results submitted within 30 days**
	Comments: Release sampling reports were not received for 3 releases in August 2016, which was when the operator was having medical issues. Please note: To help determine the causes of wastewater releases across Minnesota, the MPCA has developed a new form for sampling releases. The new form is based on input from operators at the March 2019 annual wastewater conference and what other Midwest states use for sampling releases. Going forward, please use this form for sampling releases: www.pca.state.mn.us/sites/default/files/wq-wwtp7-20a.docx. Note: The new form requires more information. If you have any questions, please contact me.

Incident id	Incident date time	DO report received	Time elapsed	Incident type description
190855	7/28/2019 17 :23	7/28/2019 18 :42	1 hour 19 min	Release - Collection System - Dry Weather
186914	6/14/2018 8 :30	6/14/2018 13 :35	5 hours 5 min	Release - Collection System - Dry Weather
105563	10/3/2017 4 :30	10/3/2017 4 :43	3 min	Release - Collection System - Wet Weather
101959	8/30/2016 12 :40	8/30/2016 8 :00	7 hours 20 min	Release - Collection System - Wet Weather
101802	8/17/2016 20 :55	8/17/2016 20 :07	48 min	Release - Collection System - Dry Weather
101746	8/11/2016 3 :55	8/11/2016 13 :25	10 hours 30 min	Release - Collection System - Wet Weather, Release - Basement Backup
101491	7/23/2016 12 :50	7/23/2016 13 :19	29 min	Release - Basement Backup
100997	6/12/2016 22 :38	6/12/2016 22 :44	6 min	Release - Facility - Wet Weather

185107	6/22/2015 8 :10	6/22/2015 8 :58	48 min	Spill or Release
185015	2/16/2015 17 :15	2/16/2015 17 :20	5 min	Release - Basement Backup, Spill or Release
185019	1/24/2015	2/18/2015 15 :34	25 days	Release - Basement Backup, Spill or Release
142712	6/19/2014 2 :45	6/19/2019 5 :34	2 hours 49 min	Release – Collection System, Release – Basement Backup

☐NC ☒C ☐A	**Nuisance conditions prohibited**
	Comments: None were reported
☐NI	**Sampling methods/lab certification**
☐NC ☐C ☒A	**Representative sampling (Sample type, location, timing)**
	Comments: There is an agreement in place with the city allowing a septage hauler to access the ponds to dump waste into the pond via a pipe over the side of the dike. The addition of the septage directly to the pond and unknown accuracy of reported flow from the hauler means that flow may not be accurately represented in flow measurements at WS001. The flow measurements would be more accurate if the septage was added at a lift station prior to the influent station WS001 where influent flow is measured. There was no indication that the septage from the hauler is evaluated on a regular basis. It is the responsibility of the city to know what is being added to their treatment system and ensure that the system can handle the load.
☐NC ☐C ☒A	**Additional sampling (If yes – reported on DMR and Sample Values)**
☐NC ☒C ☐A	**Certified lab analyzes samples or field parameters in-house and calibrations compliant** • **Certified laboratory name:** UC labs- Lester Prairie
	Comments: Additional samples should be taken if, for example, it could reduce the average of a high result that is calculated as an average or verification of a high result. Those additional samples should be recorded in the sample values spreadsheet that are submitted to the MPCA and included in DMR calculations.
	Field parameter analysis: pH • **Instrument Manufacturer and Model**: Oakton PH-6 • **Calibration procedure and records:** records reviewed • **Minimum of 2 point calibration:** yes • **Buffers current (e.g., not expired):** not inspected • **Calibrated each day of sample:** yes
	Comments: Equipment is calibrated at the Lester Prairie Lab. pH calibration records were provided for 2017-2019 via email.
	Field parameter analysis: Dissolved Oxygen (DO) • **Instrument manufacturer and model:** YSI 550A • **Calibration procedure and records:** records reviewed • **Calibration frequency:** 1/sample
	Comments: Equipment is calibrated at the Lester Prairie Lab. DO calibration records were provided for 2017-2019 via email.
☐NC ☐C ☐A ☒NA	**Method detection limit and reporting limit established**
	Comments:
☐NC ☒C ☐A	**Sample Preservation and Procedures** • **Sample Type (e.g. Comp. vs. Grab) compliant with Limits & Monitoring** • **Holding Times (e.g. pH, TRC, D.O. w/in 15 min., etc.)** • **Thermal preservation adequate (≤6°Celsius)** • **Composite Samples refrigerated during sample collection if applicable** • **Thermometers (Sample Fridge, etc. checked annually w/NIST)**

	Comments:
☐NI	**Discharge Monitoring Reports/sample values/annual reports**
☒NC ☐C	**Timeliness** • **Reports (Required reports submitted on time)** • **Sample Values submitted on time** • **Discharge Monitoring Reports (DMRs) submitted on time**

Comments: The June, July and August 2016 DMRs and sample values were late due to operator medical issues. There were a total of 8 late DMRs between 1 and 35 days late. Seven sample values are missing between October 2015 and June 2016 and there was 1 late submittal. Between December 2015 and September 2016, sample values were submitted as attachments instead of appropriately uploaded as sample values. More recent documents have been submitted appropriately.

Station ID/Report	DMR Monitoring period	Due date (mm/dd/yyyy)	Date received (mm/dd/yyyy)	Days late
SD003	June-16	07/21/2016	08/25/2016	35
SD003	July-16	08/21/2016	08/25/2016	4
SD003	August-16	09/21/2016	09/26/2016	5
WS001	August-14	09/21/2014	09/24/2014	3
WS001	December-15	01/21/2016	01/22/2016	1
WS001	June-16	07/21/2016	08/25/2016	35
WS001	July-16	08/21/2016	08/25/2016	4
WS001	August-16	09/21/2016	09/26/2016	5

Station ID	Sample Values Monitoring period	Due date (mm/dd/yyyy)	Date received (mm/dd/yyyy)
SD 003	October-15	11/21/2015	Missing
SD 003	May-16	6/21/2016	Missing
SD 003	June-16	7/21/2016	8/25/2016
WS 001	October-15	11/21/2015	Missing
WS 001	November-15	12/21/2015	Missing
WS 001	January-16	2/21/2016	Missing
WS 001	March-16	4/21/2016	Missing
WS 001	May-16	6/21/2016	Missing
WS 001	June-16	7/21/2016	8/25/2016

Compliance status	Requirement and notes
☒NC ☐C ☐A	**Completing Reports (DMRs, etc. complete and submitted on MPCA approved forms)**
	Accuracy (e.g., Lab data match all DMR values and frequency)
	Comments: There was missing data in the August 2016 DMR for Flow and precipitation, which was amended on June 25, 2019. DMRs for April, May, September, October, November and December 2016 and March & September 2017 WS001 as well as May and June 2017 SD003 were incorrectly marked as no discharge when there was a discharge. These have since been amended. October 2015 stations SD003 and WS001 and November 2015 station WS001 DMRs are missing data. (see Missing Parameters table below)
☒NC ☐C	**Frequency of sampling (as required by permit, no missed samples):** There is one missed sample, see missing parameters table below.
☒NC ☐C	**Permit limit compliance:** Effluent limits were not met for parameters shown in table below.

Missing parameters

Station	Monitoring Period	Parameter	Limit Type	Units
SD 003	Oct-15	BOD, Carbonaceous 05 Day (20 Deg C)	CalMoAvg	kg/d
SD 003	Oct-15	BOD, Carbonaceous 05 Day (20 Deg C)	CalMoAvg	mg/L
SD 003	Oct-15	BOD, Carbonaceous 05 Day (20 Deg C)	MxCalWkAvg	kg/d
SD 003	Oct-15	BOD, Carbonaceous 05 Day (20 Deg C)	MxCalWkAvg	mg/L
SD 003	Oct-15	Fecal Coliform, MPN or Membrane Filter 44.5C	CalMoGeoMn	#/100ml
SD 003	Oct-15	Flow	CalMoAvg	mgd
SD 003	Oct-15	Flow	CalMoTot	Mgal
SD 003	Oct-15	Oxygen, Dissolved	CalMoMin	mg/L
SD 003	Oct-15	pH	CalMoMax	SU
SD 003	Oct-15	pH	CalMoMin	SU
SD 003	Oct-15	Phosphorus, Total (as P)	CalMoAvg	kg/d
SD 003	Oct-15	Phosphorus, Total (as P)	CalMoAvg	mg/L
SD 003	Oct-15	Solids, Total Suspended (TSS)	CalMoAvg	kg/d
SD 003	Oct-15	Solids, Total Suspended (TSS)	CalMoAvg	mg/L
SD 003	Oct-15	Solids, Total Suspended (TSS)	MxCalWkAvg	kg/d
SD 003	Oct-15	Solids, Total Suspended (TSS)	MxCalWkAvg	mg/L
SD 003	Jun-17	Solids, Total Dissolved (TDS)	CalMoMax	mg/L
WS 001	Oct-15	Flow	CalMoAvg	mgd
WS 001	Oct-15	Flow	CalMoMax	mgd
WS 001	Nov-15	Precipitation	CalMoTot	in
WS 001	Nov-15	Flow	CalMoTot	Mgal
WS 001	Nov-15	Flow	CalMoAvg	mgd
WS 001	Nov-15	Flow	CalMoMax	mgd

Permit limit exceedences

DMR start date (mm/dd/yyyy)	Station ID	Parameter	Units	Limit type	Discharge limit	Reported value	Rpt. Value to Limit
4/1/2016	SD003	BOD, Carbonaceous 05 Day (20 Deg C)	kg/d	CalMoAvg	124.7	178	1.43
4/1/2016	SD003	BOD, Carbonaceous 05 Day (20 Deg C)	kg/d	MxCalWkAvg	199.5	291	1.46
4/1/2016	SD003	BOD, Carbonaceous 05 Day (20 Deg C)	mg/L	CalMoAvg	25	35	1.40
4/1/2016	SD003	BOD, Carbonaceous 05 Day (20 Deg C)	mg/L	MxCalWkAvg	40	58	1.42
3/1/2017	SD003	BOD, Carbonaceous 05 Day (20 Deg C)	mg/L	CalMoAvg	25	29	1.16
12/1/2018	SD003	pH	SU	CalMoMax	9	9.1	1.01

Compliance status	Requirement and notes
☐NC ☐C ☒A ☐NA	**Effluent exceedence follow-up**
	Comments: April 2016 CBOD results were high on the first sample, however no additional samples beyond those required were taken before discharge ceased on April 27th to help bring down the average result below the limit. March 2017 CBOD results indicated, according to the operator, that the pond turned over. Discharge was stopped. December 2018 - Predischarge samples were above limit for pH calendar month maximum. The first pH sample of the discharge was not above the limit, however the second was above the calendar month maximum. The operator believes that the pH meter was bad and completed checks to verify results after these samples were taken and updates were completed. If effluent violations are found, it is advised that additional samples are taken to confirm accuracy of the result and/or to reduce the average for the month (if it is an averaged parameter) if it is believed that better results can be attained. *All actions taken to get back into compliance or stop effluent violations, and reasons for the exceedence should be recorded in the comments section of the DMR or as an attachment with the DMR for that monitoring period.*
☐NI	**Record keeping**
☐NC ☐C ☒A	**Maintain records for at least three years and with following:** • **Place, date, time of sample/measurement** • **Date of analysis** • **Name of person performing sample/measurement, etc.** • **Analytical techniques, procedures, and methods used** • **Results of analysis**
	Comment: Make sure all data collection and analysis records are initialed or signed by the person who completed the task. If initials are used, a log should be kept to indicate who the initials belong to in a signature log like the one provided by the MPCA to the operator in an email on June 17, 2019.
	Chain of Custody (COC) forms (completely filled out, available, etc.)
	Comments: complete
	Enforcement actions over the review period: none
	Comments:
	Compliance schedule progress: not applicable
	Comments:
	Biosolids/land application sites: none
	Comments:
	Pretreatment **Significant industrial users:** None • **Agreement in place and up to date** • **Inspection frequency:** / • **Sampling frequency:** /
	Comments: not applicable
	Stabilization pond operation
☐NC ☐C ☒A ☐NA	**Bypass structures** – all structures capable of bypassing kept locked, including the new valve on the discharge pipe.
☐NC ☐C ☒A	**Pre-discharge samples - MPCA notified if results indicate potential noncompliance**
	• **Samples taken as a composite from four sides** • **Samples less than two weeks prior to discharge (pH & DO within 24 hours prior)**

	Comments: Predischarge samples should be pulled from the sides of the ponds, not the corners. This will allow for more representative sampling since materials tend to build up in the corners of ponds and do not represent the mixing that occurs in the rest of the pond.
☒NC ☐C ☐A	**Pond observations – Pond system inspected weekly and records kept of** • **Water depth; Aquatic plant coverage; Floating mats & ice cover; Odors; Condition of dikes; & presence of rodents (muskrats, burrowing animals)**
	Comments: Pond observations were not received for 8 of the months between April 2015 and May 2016. The August 2016 pond observation report was received June 25, 2019 after amendments were made to the August 2016 DMR after the MPCA inspection. See table below.
☐NC ☒C ☐A	• **Daily Precipitation records**

Report	Monitoring period	Due date (mm/dd/yyyy)	Date received (mm/dd/yyyy)
Pond Observations	April 2015	5/21/2015	Missing
Pond Observations	May 2015	6/21/2015	Missing
Pond Observations	September 2015	10/21/2015	Missing
Pond Observations	October 2015	11/21/2015	Missing
Pond Observations	November 2015	12/21/2015	Missing
Pond Observations	January 2016	2/21/2016	Missing
Pond Observations	March 2016	4/21/2016	Missing
Pond Observations	May 2016	6/21/2016	Missing
Pond Observations	August 2016	9/21/2016	6/25/2019

Alleged violations/Corrective actions (Provided as indicated below):

- Follow-up correspondence will be mailed at a later date: ☒ Some of the violations listed above as noncompliant will be addressed in a follow up document
- See below: ☒ Some of the violations are addressed below.

Violation number	Requirement (e.g., Minn. R., Permit condition)	Description of noncompliance	Corrective action	Timeline (e.g., immediately, within 10 days)
1	NPDES/SDS permit MNG580164 Chapter 1. General Stabilization pond Section 9.2 & 10.9 Discharge Monitoring Reports Submit monthly DMR monthly by 21 days after the end of each calendar month	The Regulated Party failed to submit a monthly DMR monthly by 21 days after the end of each calendar month. The MPCA found that there were 5 monitoring periods with a total of 8 late DMRs. Six DMRs were 5 or less days late. Two were 35 days late.	This violation was discussed during the inspection and no further action is required.	
2	NPDES/SDS permit MNG580164 Chapter 1. General Stabilization pond 18.2 Completing Reports. Submit results of required sampling and monitoring activities on forms provided	The Regulated Party failed to submit complete reports. There were missing parameters and inaccurate no discharge notifications.	This violation was discussed during the inspection and follow up emails. DMRs have been amended to the extent possible and no further action is required.	
3	NPDES/SDS permit MNG580164 Limits and Monitoring table	The Regulated Party failed to complete a sample for the January-June 2017 monitoring period for Total Dissolved Solids at SD003.	Ensure that all samples are taken at the frequency laid out in the limits and monitoring table of the permit.	This corrective action has been completed.
4	NPDES/SDS permit MNG580164 Chapter 1. General Stabilization pond Section 12.10 Pond Observations	The Regulated Party failed to submit pond observations for 9 monitoring periods between April 2015 and May 2016.	Submit any missing pond observation reports that you still have records for via eServices for the missing September 2015 - May 2016 monitoring periods. Mail in or email pond observation reports for April 2015 and May2015 if they are available. If not, send an email noting that records were not available for which monitoring periods.	Within 30 days of receipt of this compliance evaluation report.
5	NPDES/SDS permit MNG580164 Limits and Monitoring table	The Regulated Party failed to meet effluent limits as laid out in the limits and monitoring table of the permit for SD003 for CBOD in April 2016 and March 2017.	These violations were discussed at the inspection and no further action is required.	

Address questions and submittals requested above to:

Chandi McCracken-Holm
Minnesota Pollution Control Agency
520 Lafayette Rd N
Saint Paul, MN 551554102
651-757-2232
chandi.mccracken-holm@state.mn.us

Appendix 9

Tower Rehab & Underground Storage Detailed Cost Estimates

Project Name:	**2020 Silver Lake Water System Improvements**
SEH Project No:	**SILAK 152875**
Date:	**October 6, 2020**
Estimator:	**Short Elliott Hendrickson Inc.**
Description:	**Existing Water Tower Rehabilitation**

OPINION OF PROBABLE COST

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
GENERAL CONDITIONS					
1	INSPECTION REPORT	LUMP SUM	1.00	$7,500.00	$7,500
2	MOBILIZATION	LUMP SUM	1.00	$10,000.00	$10,000
3	TRAFFIC CONTROL	LUMP SUM	1.00	$500.00	$500
4	DUST CONTAINMENT STRUCTURE	LUMP SUM	1.00	$50,000.00	$50,000
				SUB-TOTAL	*$60,500*
INTERIOR IMPROVEMENTS					
5	CAULKING	LUMP SUM	1.00	$500.00	$500
6	GRINDING	LUMP SUM	1.00	$500.00	$500
7	SAFETY-CLIMB	LUMP SUM	1.00	$2,500.00	$2,500
8	MISCELLANEOUS STRUCTURAL MODIFICATIONS	LUMP SUM	1.00	$10,000.00	$10,000
9	INTER BLASTING & COATING	LUMP SUM	1.00	$100,000.00	$100,000
				SUB-TOTAL	*$113,500*
EXTERIOR IMPROVEMENTS					
10	MISCELLANEOUS STRUCTURAL MODIFICATIONS	LUMP SUM	1.00	$15,000.00	$15,000
11	SAFETY-CLIMB	LUMP SUM	1.00	$5,000.00	$5,000
12	EXTERIOR BLASTING & COATING	LUMP SUM	1.00	$200,000.00	$200,000
				SUB-TOTAL	*$220,000*
		TOTAL OF CONSTRUCTION ITEMS			**$394,000**
				CONTINGENCY	$39,400
		TOTAL ESTIMATED CONSTRUCTION COST			**$433,400**
				ENGINEERING	$70,920
				LEGAL & ADMIN	$9,900
				MATERIALS TESTING	$3,200
				SUBTOTAL	**$517,420**
				INTERIM INTEREST	$13,300
		TOTAL ESTIMATED CAPITAL COST			**$530,800**

Project Name: 2020 Silver Lake Water System Improvements
SEH Project No: SILAK 152875
Date: October 6, 2020
Estimator: Short Elliott Hendrickson Inc.

Description: New Underground Storage Tank & Pump Station

OPINION OF PROBABLE COST

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
GENERAL CONDITIONS					
1	MOBILIZATION	LUMP SUM	1.00	$50,000.00	$50,000
2	TRAFFIC CONTROL	LUMP SUM	1.00	$1,000.00	$1,000
3	CLEARING AND GRUBBING	LUMP SUM	1.00	$5,000.00	$5,000
4	REMOVE BITUMINOUS PAVEMNT AND CURB & GUTTER	LUMP SUM	1.00	$3,000.00	$3,000
				SUB-TOTAL	*$59,000*
WATER MAIN					
5	8" WATER MAIN (OPEN CUT)	LF	250.00	$100.00	$25,000
6	HYDRANT	EA	1.00	$6,000.00	$6,000
7	8" GATE VALVE AND BOX	EA	2.00	$2,500.00	$5,000
8	CONNECT TO EXISTING PIPE	EA	2.00	$5,000.00	$10,000
				SUB-TOTAL	*$46,000*
SITE WORK					
9	EXTEND CURB & GUTTER	LF	125.00	$28.00	$3,500
10	FENCE	LF	100.00	$12.00	$1,200
				SUB-TOTAL	*$4,700*
STANDPIPE & PUMP STATION					
8	COMMON EXCAVATION	CY	500.00	$12.00	$6,000
9	100,000 GALLON UNDERGROUND STORAGE	EA	1.00	$200,000.00	$200,000
10	PRE-FABRICATED PUMP STATION	EA	1.00	$650,000.00	$650,000
11	PUMP STATION INSTALLATION	EA	1.00	$50,000.00	$50,000
12	STANDBY GENERATOR	LUMP SUM	1.00	$30,000.00	$30,000
				SUB-TOTAL	*$936,000*
ELECTRICAL AND SCADA					
13	ELECTRICAL SITE WORK	LUMP SUM	1.00	$10,000.00	$10,000
13	SCADA PROGRAMMING	LUMP SUM	1.00	$5,000.00	$5,000
				SUB-TOTAL	*$15,000*
EROSION CONTROL/ RESTORATION					
14	EROSION CONTROL	LUMP SUM	1.00	$5,000.00	$5,000
15	ROAD PATCH	LUMP SUM	1.00	$5,000.00	$5,000
16	TURF RESTORATION	LUMP SUM	1.00	$10,000.00	$10,000
				SUB-TOTAL	*$20,000*
				CONSTRUCTION TOTAL	**$1,080,700**
				CONTINGENCY	$108,070
				TOTAL ESTIMATED CONSTRUCTION COST	**$1,188,770**
				ENGINEERING	$194,530
				LEGAL & ADMIN	$27,000
				MATERIALS TESTING	$8,600
				SUBTOTAL	**$1,418,900**
				INTERIM INTERST	$36,600
				TOTAL ESTIMATED CAPITAL COST	**$1,455,500**

Appendix 10

Water Tower Detailed Cost Estimate

Project Name:	**2020 Silver Lake Water System Improvements**
SEH Project No:	**SILAK 152875**
Date:	**October 6, 2020**
Estimator:	**Short Elliott Hendrickson Inc.**
Description:	**New Elevated Water Tower**

OPINION OF PROBABLE COST

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
GENERAL CONDITIONS					
1	MOBILIZATION	LUMP SUM	1.00	$50,000.00	$50,000
2	TRAFFIC CONTROL	LUMP SUM	1.00	$1,000.00	$1,000
3	CLEARING AND GRUBBING	LUMP SUM	1.00	$5,000.00	$5,000
4	REMOVE BITUMINOUS PAVEMNT AND CURB & GUTTER	LUMP SUM	1.00	$3,000.00	$3,000
				SUB-TOTAL	*$59,000*
WATER MAIN					
5	8" WATER MAIN (OPEN CUT)	LF	250.00	$100.00	$25,000
6	HYDRANT	EA	1.00	$6,000.00	$6,000
7	8" GATE VALVE AND BOX	EA	2.00	$2,500.00	$5,000
8	CONNECT TO EXISTING PIPE	EA	2.00	$5,000.00	$10,000
				SUB-TOTAL	*$46,000*
SITE WORK					
9	EXTEND CURB & GUTTER	LF	125.00	$28.00	$3,500
10	FENCE	LF	100.00	$12.00	$1,200
				SUB-TOTAL	*$4,700*
WATER TOWER					
10	150,000 GAL SINGLE PEDESTAL WATER TOWER (FOUNDATION, TANK, COATINGS)	EA	1.00	$1,000,000.00	$1,000,000
11	WATER TOWER MIXER	LF	1.00	$10,000.00	$10,000
				SUB-TOTAL	*$1,010,000*
ELECTRICAL AND SCADA					
12	ELECTRICAL SITE WORK	LUMP SUM	1.00	$10,000.00	$10,000
13	SCADA PROGRAMMING	LUMP SUM	1.00	$5,000.00	$5,000
				SUB-TOTAL	*$15,000*
EROSION CONTROL/ RESTORATION					
14	EROSION CONTROL	LUMP SUM	1.00	$5,000.00	$5,000
15	ROAD PATCH	LUMP SUM	1.00	$5,000.00	$5,000
16	TURF RESTORATION	LUMP SUM	1.00	$10,000.00	$10,000
				SUB-TOTAL	*$20,000*
			CONSTRUCTION TOTAL		**$1,154,700**
				CONTINGENCY	$115,470
		TOTAL ESTIMATED CONSTRUCTION COST			**$1,270,170**
				ENGINEERING	$207,850
				LEGAL & ADMIN	$28,900
				MATERIALS TESTING	$9,200
				SUBTOTAL	**$1,516,120**
				INTERIM INTEREST	$39,100
		TOTAL ESTIMATED CAPITAL COST			**$1,555,300**

Appendix 11

Standpipe & Pump Station Detailed Cost Estimate

Project Name:	**2020 Silver Lake Water System Improvements**
SEH Project No:	**SILAK 152875**
Date:	**May 21, 2022**
Estimator:	**Short Elliott Hendrickson Inc.**
Description:	**New Standpipe & Pump Station**

OPINION OF PROBABLE COST

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
GENERAL CONDITIONS					
1	MOBILIZATION	LUMP SUM	1.00	$50,000.00	$50,000
2	TRAFFIC CONTROL	LUMP SUM	1.00	$1,000.00	$1,000
3	CLEARING AND GRUBBING	LUMP SUM	1.00	$5,000.00	$5,000
4	REMOVE BITUMINOUS PAVEMNT AND CURB & GUTTER	LUMP SUM	1.00	$3,000.00	$3,000
5	DECOMMISSION EXISTING WATER TOWER	LUMP SUM	1.00	$15,000.00	$15,000
				SUB-TOTAL	*$74,000*
WATER MAIN					
6	8" WATER MAIN (OPEN CUT)	LF	250.00	$100.00	$25,000
7	HYDRANT	EA	1.00	$6,000.00	$6,000
8	8" GATE VALVE AND BOX	EA	2.00	$2,500.00	$5,000
9	CONNECT TO EXISTING PIPE	EA	2.00	$5,000.00	$10,000
				SUB-TOTAL	*$46,000*
SITE WORK					
10	EXTEND CURB & GUTTER	LF	125.00	$28.00	$3,500
11	FENCE	LF	100.00	$12.00	$1,200
				SUB-TOTAL	*$4,700*
STANDPIPE & PUMP STATION					
10	CONCRETE FOUNDATIONS	CY	20.00	$700.00	$14,000
11	135,000 GALLON STANDPIPE	EA	1.00	$130,000.00	$130,000
12	STANDPIPE MIXER	EA	1.00	$10,000.00	$10,000
13	PRE-FABRICATED PUMP STATION	EA	1.00	$650,000.00	$650,000
14	PUMP STATION INSTALLATION	EA	1.00	$50,000.00	$50,000
15	STANDBY GENERATOR	EA	1.00	$30,000.00	$30,000
				SUB-TOTAL	*$884,000*
ELECTRICAL AND CONTROLS					
16	ELECTRICAL SITE WORK	LUMP SUM	1.00	$10,000.00	$10,000
17	CONTROL PROGRAMMING	LUMP SUM	1.00	$5,000.00	$5,000
				SUB-TOTAL	*$15,000*
EROSION CONTROL/ RESTORATION					
18	EROSION CONTROL	LUMP SUM	1.00	$5,000.00	$5,000
19	ROAD PATCH	LUMP SUM	1.00	$5,000.00	$5,000
20	TURF RESTORATION	LUMP SUM	1.00	$10,000.00	$10,000
				SUB-TOTAL	*$20,000*
				CONSTRUCTION TOTAL	**$1,053,700**
				CONTINGENCY	$105,370
			TOTAL ESTIMATED CONSTRUCTION COST		**$1,159,070**
				ENGINEERING	$189,670
				LEGAL & ADMIN	$26,300
				MATERIALS TESTING	$8,400
				SUBTOTAL	**$1,383,440**
				INTERIM INTEREST	$35,700
			TOTAL ESTIMATED CAPITAL COST		**$1,419,200**

X:\PT\S\SILAK\152875\4-prelim-dsgn-rpts\47-final-rpt\PER\RD Review comments\Comments from RD 3-4-21\Water comment responses\Updated 6.24.2021 for final\[Cost Estimates - WATER PER.xlsx]STANDPIPE & PUMP STATION

Appendix 12

MPCA Phosphorus Limit

May 21, 2020

Ms. Dorothy Butler
Mayor, City of Silver Lake
308 West Main Street
Silver Lake, MN 55381

RE: New Water Quality Based Effluent Limits
Silver Lake Wastewater Treatment Facility
NPDES/SDS Permit No. MNG580164

Dear Mayor Butler:

The Minnesota Pollution Control Agency (MPCA) has completed a review of recent monitoring data collected from the Silver Lake Wastewater Treatment Facility (Facility) and downstream receiving waters as part of the permit reissuance process for the MNG585000 Stabilization Pond wastewater treatment permit.

There are new water quality based effluent limit(s) (WQBEL) that need to be placed in the reissued permit to ensure compliance with MPCA's water quality standards. Limits are based on Total Maximum Daily Load (TMDL) studies, or River or Lake Eutrophication Standards of the receiving water. Please see the attached Effluent Limitations Summary and watershed memo for more information about the effluent limits assigned to your Facility.

As summarized in the table below, your Facility will be required to meet the following phosphorus effluent limit(s).

Table 1. Summary of Total Phosphorus Effluent Limits for your Facility

Limit	Limit Type	Effective Period	Basis
384 kg/yr	Calendar Year to Date Total	January-December	WQBEL – Lake Pepin
2.0 mg/L	Calendar Month Average	June-September	WQBEL – Crow River

Upon initial review by the MPCA, it appears that your Facility may be able to comply with the new limit(s) under current conditions, but may not be able to comply with the new limit(s) at design flow or during wet years. Please evaluate the new limit(s) and provide a response to the items below. The MPCA suggests that you work with your engineer to develop the response:

1. An evaluation of the Facility's capability of maintaining compliance with the limit during the next 5-year permit term
2. An evaluation of the Facility's capability of maintaining compliance with the limit during wet years.
3. Estimated increases in flow and loading over the next 5-year permit term.
4. Projected population/industry growth in the next 5-year permit term.

5. Projected operating conditions that when reached would likely result in noncompliance with the limit.
6. A summary of the current debt service on existing municipal wastewater infrastructure (Minn. Stat. 115.456). A form to record and report the financial data necessary for this evaluation can be found at: https://www.pca.state.mn.us/sites/default/files/wq-wwprm7-70b.xls.
7. Timeline and milestone events that will trigger the need to take action to assure that the Facility will remain in compliance.

Please provide the requested information within thirty (30) days of the date of this letter. The information should be mailed or emailed to the address listed below.

The MPCA is moving forward with a strategy to reissue the MNG585000 and issuing notices of coverage as the Phosphorus River Eutrophication Standards (RES) evaluation of individual watersheds are completed. More information will be sent out regarding the strategy after EPA's review. Your facility's watershed RES review is completed. If your Facility can meet the new limit(s) at permit issuance, and therefore does not require a compliance schedule in the permit, your Facility will remain eligible for coverage under the general pond permit and will be issued a Notice of Coverage upon reissuance of the general permit. If a compliance schedule is needed, your Facility will be reissued an individual permit.

If you have questions about the MPCA's initial review of your ability to comply with the new limits please contact MPCA engineer, Abram Peterson at 651-757-2105 or abram.peterson@state.mn.us. If you have any other questions, please contact me at:

Sarah Starr
sarah.starr@state.mn.us
520 Lafayette Road North
St. Paul, Minnesota 55155-4194
651-757-2335

Sincerely,

Sarah Starr

This document has been electronically signed.

Sarah Starr
Environmental Specialist
Municipal Division

SS:map

Enclosures: Greater Crow River Watershed Memo

cc: Dale Kosek, Public Works Supervisor, City of Silver Lake
Jon Jerabek, Clerk/Treasurer, City of Silver Lake
Lee Ortloff, Wastewater Operator, People Service
Jeremy Anderson, Wastewater Operator, People Service
John Rodenburg P.E., SHE
Activity GEN20150001 @ 1192

Appendix 13

Design Flow Calcs

Design flow determination worksheet

Project name: Silver Lake Infrastructure Improvement Project - Existing Flows
Location: Silver Lake, MN
Completed by: Maria McCarty
Consultant: SEH
Date:

Text input cell - green
Number input cell - blue
Calculation cell - no color

	(A) Determination of peak hourly wet weather design flows (PHWW):	action	Gallons per day	Source
1	Present peak hourly dry weather flow		74,000	DMR Data
2	Present peak hourly flow during high ground water period (no runoff)		103,000	Estimate
3	Present peak hourly dry weather flow [same as (1)]	-	74,000	
4	Present peak hourly infiltration	=	29,000	Estimate
5	Present hourly flow during high ground water period and runoff at point of greatest distance between Curves Y		189,000	Estimate
6	Present hourly flow during high ground water (no runoff) at same time of day as (5) measurement	-	103,000	Estimate
7	Present peak hourly inflow	=	86,000	Estimate
8	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event		143,000	Estimate
9	Present peak hourly infiltration [same as (4)]		29,000	Estimate
10	Peak hourly infiltration cost effective to eliminate	-	-	
11	Peak hourly infiltration after rehabilitation (where rehabilitation is cost effective)	=	29,000	Estimate
12	Present peak hourly adjusted inflow [same as (8)]		143,000	Estimate
13	Peak hourly inflow cost effective to eliminate	-	-	
14	Peak hourly inflow after rehabilitation (where rehabilitation is cost effective)	=	143,000	Estimate
15	Population increase 0 persons @ 100 gpcd multiplied by 2.5 (peaking factor)		-	
16	Peak hourly flow from planned industrial increase		-	
17	Estimated peak hourly flow from future unidentified industries		-	
18	Peak hourly flow from other future increases		-	
19	Peak hourly wet weather design flow [(1)+(11)+(14)+(15)+(16)+(17)+(18)]	=	246,000	Estimate

	(B) Determination of peak instantaneous wet weather design flow (PIWW):		Gallons Per Day	Source
20	Peak hourly wet weather design flow [same as (19)]		246,000	Estimate
21	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event [same as (8)]	-	143,000	Estimate
22	Present peak inflow adjusted for a 25-year 1-hour rainfall event	+	684,000	Estimate
23	Peak instantaneous wet weather design flow	=	787,000	Estimate

	(C) Determination of average dry weather design flow (ADW):		Gallons Per Day	Source
24	Present average dry weather flow		74,000	DMR Data
25	Population increase 0 persons @ 100 gpcd		-	
26	Average flow from planned industrial increase	+	-	
27	Estimated average flow from other future unidentified industries	+	-	
28	Average flow from other future increases	+	-	
29	Average dry weather design flow [(24)+(25)+(26)+(27)+(28)]	=	74,000	

	(D) Determination of average wet weather design flow (AWW): (30 day average for mechanical plants, 180 day average for controlled discharge ponds)		Gallons Per Day	Source
30	Present average dry weather flow		74,000	DMR Data
31	Average infiltration after rehabilitation (where rehabilitation is cost effective)	+	29,000	Estimate
32	Average inflow after rehabilitation (where rehabilitation is cost effective)	+	86,000	Estimate
33	Population increase 0 persons @ 100 gpcd	+	-	
34	Average flow from planned industrial increase	+	-	
35	Estimated average flow from other future unidentified industries	+	-	
36	Average flow from other future increases	+	-	
37	Average wet weather design flow [(30)+(31)+(32)+(33)+(34)+(35)+(36)]	=	189,000	DMR Data

(E) Critical data (including a graphical display similar to Figure 1), methodology, and a discussion on the following items shall be included with the above calculations:

38 Dates during which actual flow data was recorded and its probable degree of accuracy.
39 Ground water elevation data relative to the collection system, during the time period when flow data was recorded.
40 Rainfall data during the time period when flow data was recorded and how the amount of rainfall compares to normal seasons.
41 Probable degree of accuracy of flow reduction due to proposed or completed I/I correction or elimination of bypasses.

Appendix 14

Wastewater Detailed Cost Estimate

	Stabilization Ponds	Unit	Unit Price	Est. Qty.	Cost
	Boat ramps for alum addition	EACH	$10,000.00	1	$10,000.00
	Duck boat and motor	EACH	$20,000.00	1	$20,000.00
	Chemical storage shed	EACH	$15,000.00	1	$15,000.00
	Remove sludge buildup (mobilization, dredging and	CU YD	$30.00	2000	$60,000.00
	Additional rip rap (Class 3)	CU YD	$75.00	2500	$187,500.00
	Rolling vehicle gate	EACH	$9,000.00	1	$9,000.00
	Fence replacement	LF	$35.00	4000	$140,000.00
	Additional gravel for dike	TON	$28.00	1000	$28,000.00
	Pond Pumping for Construction	LUMP SUM	$20,000.00	1	$20,000.00
	Primary Pond Splitter Box	LUMP SUM	$25,000.00	1	$25,000.00
	Transfer Structures replacement	LUMP SUM	$12,000.00	1	$12,000.00
	Outlet Structure	LUMP SUM	$25,000.00	3	$75,000.00
	Primary Pond Control Structure	LUMP SUM	$25,000.00	1	$25,000.00
	Secondary Pond Control Structure	LUMP SUM	$25,000.00	1	$25,000.00
	Replace Influent Piping (10" pipes)	LF	$40.00	900	$36,000.00
	Stabilization Ponds Cost Subtotal				**$687,500.00**

	Cleveland Lift Station Improvements	Unit	Unit Price	Est. Qty.	Cost
	Remove existing pump station (wetwell, valve vault, piping, valves, control building, pumps)	LUMP SUM	$50,000.00	1	$50,000.00
	Basket Screen	LUMP SUM	$3,000.00	1	$3,000.00
	Gantry Crane (Frame and electric hoist)	LUMP SUM	$6,500.00	1	$6,500.00
	96" Diameter RCP Wetwell	EACH	$40,000.00	1	$40,000.00
	72" Diameter RCP Valve Vault	EACH	$18,000.00	1	$18,000.00
	Coating on wetwell	SQ FT	$25.00	450	$11,250.00
	6" Check Valves	EACH	$1,000.00	2	$2,000.00
	6" Plug Valves	EACH	$800.00	2	$1,600.00
	6" Vent Pipe	LUMP SUM	$7,500.00	1	$7,500.00
	Floor boxes for Valve Vault Cover Slab	EACH	$500.00	2	$1,000.00
	Pumps	EACH	$14,140.00	2	$42,000.00
	Generator	EACH	$75,000.00	1	$75,000.00
	Meter Manhole	LUMP SUM	$10,000.00	1	$10,000.00
	Dewattering	LUMP SUM	$30,000.00	1	$30,000.00
	Bypass pumping	LUMP SUM	$25,000.00	1	$25,000.00
	Site lighting	LUMP SUM	$3,000.00	1	$3,000.00
	Electrical and controls	LUMP SUM	$41,378.00	1	$41,378.00
	Fencing	LF	$35.00	200	$7,000.00
	16' Wide Rolling Gate	EACH	$4,000.00	1	$4,000.00
	Inlet protection	EACH	$200.00	1	$200.00
	Silt Fence, heavy duty	LIN FT	$3.50	450	$1,575.00
	Screened topsoil borrow (LV) (6" depth)	CU YD	$20.00	600	$12,000.00
	Turf establishment (Seed, fertilizer, hydraulic soil	SQ YD	$3.50	1200	$4,200.00
	8" Sanitary Sewer Pipe Forcemain (C900 PVC pipe)	LIN FT	$35.00	637	$22,295.00
	Cleveland LS Cost Subtotal				**$418,498.00**

	Main Lift Station Improvements	Unit	Unit Price	Est. Qty.	Cost
	New pumps	EACH	$19,000.00	2	$56,000.00
	Air release valve	EACH	$1,000.00	3	$3,000.00
	Permanent mounted generator	LUMP SUM	$75,000.00	1	$75,000.00
	Site lighting	LUMP SUM	$3,000.00	1	$3,000.00
	Vent in wetwell	LUMP SUM	$1,500.00	1	$1,500.00
	Meter Manhole	LUMP SUM	$13,000.00	1	$13,000.00
	Plug valves	EACH	$3,500.00	2	$7,000.00
	Electrical and Control	LUMP SUM	$25,000.00	1	$25,000.00
	Bypass pumping	LUMP SUM	$50,000.00	1	$50,000.00
	New top slab/hatch on valve vault	EACH	$5,000.00	1	$5,000.00
	Main LS Cost Subtotal				**$238,500.00**

Appendix 15

Pond Sludge Sampling

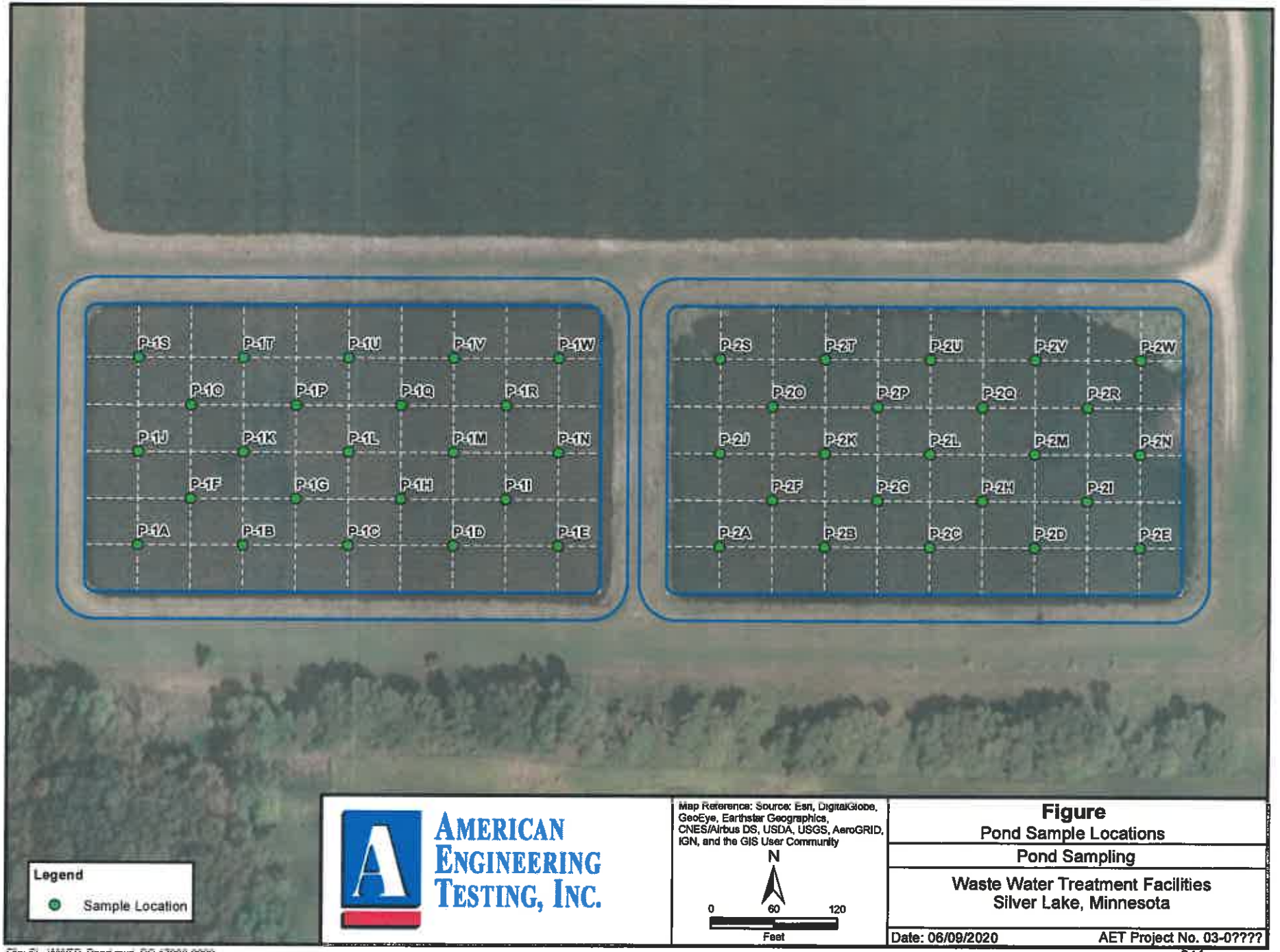

P-1S
P-1T
P-1U
P-1V
P-1W
P-1O
P-1P
P-1Q
P-1R
P-1J
P-1K
P-1L
P-1M
P-1N
P-1F
P-1G
P-1H
P-1I
P-1A
P-1B
P-1C
P-1D
P-1E
P-2S
P-2T
P-2U
P-2V
P-2W
P-2O
P-2P
P-2Q
P-2R
P-2J
P-2K
P-2L
P-2M
P-2N
P-2F
P-2G
P-2H
P-2I
P-2A
P-2B
P-2C
P-2D
P-2E
Legend
Sample Location
AMERICAN ENGINEERING TESTING, INC.
Map Reference: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
N
0
60
120
Feet
Figure
Pond Sample Locations
Pond Sampling
Waste Water Treatment Facilities
Silver Lake, Minnesota
Date: 06/09/2020
AET Project No. 03-0????
File: SL_WWTP_Pond.mxd PO 17938-????

Table 2
Silver Lake Ponds
13-Jul-20
AET # 14-20334

Location Pond #1	Total Depth Inches	Water Depth Inches	Biosolids Depth Inches
P-1A	35	31	4
P-1B	39	36	3
P-1C	39	36	3
P-1D	36	32	4
P-1E	37	33	4
P-1F	35	32	3
P-1G	38	34	4
P-1H	38	35	3
P-1I	36	33	3
P-1J	32	30	2
P-1K	37	32	5
P-1L	36	34	2
P-1M	36	32	4
P-1N	37	34	3
P-1O	34	30	4
P-1P	41	36	5
P-1Q	39	36	3
P-1R	42	37	5
P-1S	37	35	2
P-1T	34	32	2
P-1U	38	34	4
P-1V	36	32	4
P-1W	39	36	3

Location Pond #2	Total Depth Inches	Water Depth Inches	Biosolids Depth Inches
P-2A	25	22	3
P-2B	22	18	4
P-3C	20	16	4
P-2D	20	16	4
P-2E	25	21	4
P-2F	22	19	3
P-2G	20	17	3
P-2H	20	15	5
P-2I	23	19	4
P-2J	20	17	3
P-2K	20	17	3
P-2L	19	15	4
P-2M	24	2	22
P-2N	24	2	22
P-2O	22	17	5
P-2P	25	21	4
P-2Q	24	20	4
P-2R	26	21	5
P-2S	22	18	4
P-2T	20	16	4
P-2U	23	20	3
P-2V	24	21	3
P-2W	23	1	22

POND PIPING PLAN
WASTEWATER TREATMENT FACILITIES
SILVER LAKE, MINNESOTA. EPA NO. C27 1069-02
13
RECORD DRAWING 3-30-90
PRIMARY POND #2
PRIMARY POND #1
SECONDARY POND
E. OTTER CREEK W/COUNTY DITCH NO. 8

Appendix 16

Pond Size Calcs

SILAK 152875 - PER/ER

Flows and Loads

Pond Size

01.22.2020

Calculations set to Automatic

R						
	Pond Sizing					
1	*1.1 Organic Loading for a Non-aerated system*					
2	BOD5 loading* Design Standard	0.5	lbs / 1,000 sf / day			
3	BOD5 loading* Design Standard	22	lbs / acre / day			
4	*at mean operating depth for primary cell					
5						
6	Existing BOD5 loading	54.5	lbs / day			
7	Required surface area* (R6*1,000/R2)	109,000	sf			
8	**Required surface area* (R8/43,560)**	**2.5**	**acre**			
9	*at mean operating depth for primary cell					
10	Surface area	7.08	acres			
11		OK				
12						
13						
14	*2.1 Detention Time for a Non-areated system*					
15	Detention Time	180	days			
16						
17	Existing AWW flow	0.189	mgd	0.139	0.0278	0.1668
18	Existing AWW flow (R17*10^6*0.133681)	25,270	cf/day		3,720	cf/day
19	Detention Time at Existing AWW	132	Days			
20						
21	Required storage volume (R15*R18)	4,548,600	cf		669,600	cf
22	**Required storage volume (R21/43,560)**	**104**	**ac-ft**		**15**	**ac-ft**
23	Actual Storage Volume	76.83	ac-ft			
24		does not meet				

Appendix 17

SUIP Detailed Cost Estimate

COST ESTIMATE - TOTAL RECONSTRUCT (STREETS, STORM, SANITARY, WATER)

Legend	
(yellow)	CITY ONLY COST FOR STREETS
(tan)	CITY/USDA-RD WATER-WASTEWATER-STORM SPLIT
(light blue)	USDA-RD WATER/WASTEWATER ELIGIBLE
(blue)	USDA-RD 100% STORM COST

TOTAL PROJECT				Cost Split Totals								TOTAL PROJECT	
Item No.	Item Description	Unit	Unit Price	Wastewater Quantity	Wastewater Cost	Water Quantity	Water Cost	Storm Quantity	Storm Cost	City Quantity	City Cost	Est Qty	Cost
Street, Curb and Gutter, Drainage Pipe, Driveways													
2021.501	Mobilization	LUMP SUM	$ 1,042,924.16	0.36	$ 374,836.64	0.40	$ 418,822.55	0.22	$ 225,360.30	0.02	$ 24,102.66	1.0	$ 1,042,924.16
2101.524	Clearing (15" Tree or Smaller)	TREE	$300	8.34	$ 2,502.00	8.80	$ 2,640.00	6.80	$ 2,040.00	0.06	$ 18.00	24.0	$ 7,200
2101.524	Clearing (16" Tree or Larger)	TREE	$500	15.93	$ 7,965.00	16.40	$ 8,200.00	8.40	$ 4,200.00	0.27	$ 135.00	41.0	$ 20,500
2101.524	Grubbing (15" Tree or Smaller)	TREE	$350	8.34	$ 2,919.00	8.80	$ 3,080.00	6.80	$ 2,380.00	0.06	$ 21.00	24.0	$ 8,400
2101.524	Grubbing (16" Tree or Larger)	TREE	$400	15.60	$ 6,238.67	16.07	$ 6,429.67	8.07	$ 3,226.67	0.27	$ 108.00	40.0	$ 16,000
2104.502	Remove Sign	EACH	$50.00	27.89	$ 1,394.50	31.65	$ 1,582.50	15.15	$ 757.50	2.31	$ 115.50	77.0	$ 3,850
2104.503	Remove Concrete Curb and Gutter	LIN FT	$6.00	10,362.00	$ 62,172.00	11,585.20	$ 69,511.20	5,599.90	$ 33,599.40	678.70	$ 4,072.20	28,225.8	$ 169,355
2104.503	Sawing Bituminous Pavement	LIN FT	$2.00	409.88	$ 819.76	443.00	$ 886.00	206.00	$ 412.00	33.12	$ 66.24	1,092.0	$ 2,184
2104.504	Remove Concrete Walk	SQ YD	$10.00	563.63	$ 16,635.62	1,617.39	$ 20,106.85	243.88	$ 12,754.07	2,858.54	$ 1,139.00	5,283.4	$ 52,834
2104.504	Remove Bituminous Pavement (P)	SQ YD	$6.00	18,488.53	$ 110,931.20	20,587.33	$ 123,524.00	11,094.17	$ 66,565.00	1,132.97	$ 6,797.80	51,303.0	$ 307,818
2104.505	Remove Driveway Pavement	SQ YD	$10.00	1,323.97	$ 13,239.73	1,416.06	$ 14,160.63	791.08	$ 7,910.83	47.86	$ 478.60	3,579.0	$ 35,790
2105.504	Geotextile Fabric Type V (Non Woven)	SQ YD	$3.00	0.00	$ -	0.00	$ -	0.00	$ -	56,962.92	$ 170,889	56,962.9	$ 170,889
2105.507	Common Excavation (EV) (P)	CU YD	$25.00	18,307.27	$ 457,682	20,457.20	$ 511,430	11,015.10	$ 275,377	1,176.31	$ 29,408	50,955.9	$ 1,273,897
2105.507	Subgrade Excavation (EV)	CU YD	$25.00	1,830.73	$ 45,768	2,045.72	$ 51,143	1,101.51	$ 27,538	117.63	$ 2,941	5,095.6	$ 127,390
2105.507	Select Granular Borrow (CV) (P)	CU YD	$37.00	0.00	$ -	0.00	$ -	0.00	$ -	37,975.28	$ 1,405,085	37,975.3	$ 1,405,085
2118.509	Aggregate Surfacing, Class 5 (Temporary)	TON	$52.00	0.00	$ -	0.00	$ -	0.00	$ -	5,696.20	$ 296,207	5,696.3	$ 296,207
2123.610	Investigative Exploration	HOUR	$500.00	20.47	$ 10,237.43	22.09	$ 11,446.77	12.27	$ 6,135.58	1.32	$ 661.66	57.0	$ 28,481
2123.610	Street Sweeper (With Broom Pickup)	HOUR	$150.00	102.37	$ 15,356.15	114.47	$ 17,170.16	61.36	$ 9,203.38	6.62	$ 992.51	284.8	$ 42,722
2130.523	Water (For Dust Control)	MGAL	$60.00	18.49	$ 1,109.31	20.59	$ 1,235.24	11.09	$ 665.65	1.13	$ 67.86	51.3	$ 3,078
2130.523	Water (For Turf Establishment)	MGAL	$60.00	25.88	$ 1,553.04	28.82	$ 1,729.34	15.53	$ 931.91	1.59	$ 95.17	71.8	$ 4,309
2211.507	Aggregate Base, Class 5 (CV) (P)	CU YD	$53.00	4,549.97	$ 241,148.38	5,087.45	$ 269,635.00	2,726.93	$ 144,527.11	294.08	$ 15,586.13	12,658.4	$ 670,897
2331.603	Joint Adhesive	LIN FT	$1.00	10,771.88	$ 10,771.88	12,028.20	$ 12,028.20	5,805.90	$ 5,805.90	711.82	$ 711.82	29,317.8	$ 29,318
2357.506	Bituminous Material For Tack Coat (CSS-1H)	GAL	$3.00	846.52	$ 2,539.57	946.36	$ 2,839.08	509.22	$ 1,527.65	54.46	$ 163.39	2,356.6	$ 7,070
2360.509	Type SP 9.5 Wearing Course Mix (2,C) (SPWEA240C)	TON	$125.00	1,757.10	$ 219,637.92	1,951.49	$ 243,935.66	1,100.37	$ 137,546.31	106.04	$ 13,254.61	4,915.0	$ 614,374
2360.509	Type SP 9.5 Wearing Course Mix (2,B) (SPWEA240B) (Bit Driveway Pavement)	TON	$250.00	74.93	$ 18,733.33	90.83	$ 22,708.33	47.33	$ 11,833.33	7.90	$ 1,975.00	221.0	$ 55,250
2360.509	Type SP 9.5 Wearing Course Mix (2,B) (SPWEA240B) (Patching)	TON	$200.00	0.00	$	0.00	$ -	20.00	$ 4,000.00	0.00	$ -	20.0	$ 4,000
2360.509	Type SP 12.5 Non-wearing Course Mix (2,B) (SPNWB230B)	TON	$170.00	2,655.89	$ 342,706.76	3,179.86	$ 381,583.16	1,761.33	$ 211,380.19	176.73	$ 21,207.37	7,973.8	$ 958,857
[illegible]	Aggregate (Granular) Backfill (CV)	CU YD	[illegible]	1,830.73	$ 67,736.90	2,045.72	$ 75,691.66	1,101.51	$ [illegible]	117.63	$ 4,352.35	5,095.6	$ 188,537
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]
2521.518	4" Concrete Walk w/4" Aggregate Base	SQ FT	[illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ [illegible]	[illegible]	$ 373,304
2521.518	6" Concrete Walk w/4" Aggregate Base (Pedestrian Ramp)	SQ FT	$15.00	230.18	$ 3,452.63	786.29	$ 11,794.38	83.13	$ 1,247.00	1,310.40	$ 19,656.00	2,410.0	$ 36,150
2531.503	Concrete Curb & Gutter, Design B618	LIN FT	$25.00	9,843.90	$ 246,097.50	11,005.94	$ 275,148.50	5,319.51	$ 132,987.83	644.77	$ 16,119.13	26,814.5	$ 670,363
2531.503	Concrete Curb & Gutter (Hand Formed)	LIN FT	$50.00	518.10	$ 25,905.00	579.26	$ 28,963.00	280.00	$ 13,999.75	33.94	$ 1,696.75	1,411.3	$ 70,565
2531.504	7" Concrete Driveway Pavement w/6" Aggregate Base (Residential)	SQ YD	$100.00	1,280.94	$ 128,094.00	1,374.75	$ 137,475.00	724.75	$ 72,475.00	49.56	$ 4,956.00	3,430.0	$ 343,000
2531.504	7" Concrete Driveway Pavement w/12" Aggregate Base (Commercial)	SQ YD	$105.00	20.00	$ 2,100.00	20.00	$ 2,100.00	0.00	$ -	0.00	$	40.0	$ 4,200
2531.618	Truncated Domes	SQ FT	$65.00	37.34	$ 2,427.10	183.30	$ 11,914.60	26.96	$ 1,752.40	246.40	$ 16,016.00	494.0	$ 32,110
2563.601	Traffic Control	LUMP SUM	$60,000.00	0.36	$ 21,563.17	0.40	$ 24,085.09	0.22	$ 12,965.10	0.02	$ 1,386.64	1.0	$ 60,000
2564.518	Sign Panels Type C	SQ FT	$100.00	83.67	$ 8,367.00	94.95	$ 9,495.00	45.45	$ 4,545.00	6.93	$ 693.00	231.0	$ 23,100
2575.001	Erosion Control	LUMP SUM	$100,000.00	0.36	$ 35,921.95	0.40	$ 40,158.49	0.22	$ 21,608.50	0.02	$ 2,311.07	1.0	$ 100,000
2575.604	Turf Establishment (includes 3" select topsoil borrow)	SQ YD	$2.00	9,498.69	$ 18,997.38	10,640.44	$ 21,280.67	5,385.99	$ 10,771.98	636.00	$ 1,271.90	26,161.1	$ 52,322.22
2582.503	4" Solid Line Paint, White (Parking)	LIN FT	$3.00	804.33	$ 2,413.00	856.33	$ 2,569.00	756.33	$ 2,269.00	12.00	$ 36.00	2,429.0	$ 7,287.00
2582.503	12" Solid Line Paint, White (Stop bar/Crosswalk)	LIN FT	$4.00	295.77	$ 1,183.07	304.17	$ 1,216.67	203.67	$ 814.67	8.40	$ 33.60	812.0	$ 3,248.00
					$ 2,572,545		$ 2,950,515		$ 2,015,213		$ 2,270,002		$ 9,808,276

COST ESTIMATE - TOTAL RECONSTRUCT (STREETS, STORM, SANITARY, WATER)

	CITY ONLY COST FOR STREETS
	CITY/USDA-RD WATER-WASTEWATER-STORM SPLIT
	USDA-RD WATER/WASTEWATER ELIGIBLE
	USDA-RD 100% STORM COST

TOTAL PROJECT				Cost Split Totals								TOTAL PROJECT	
Item No.	Item Description	Unit	Unit Price	Wastewater Quantity	Wastewater Cost	Water Quantity	Water Cost	Storm Quantity	Storm Cost	City Quantity	City Cost	Est. Qty	Cost
Storm Sewer		**Unit**	**Unit Price**									**Est. Qty.**	**COST**
2104.502	Remove Storm Structure (Catch Basin or Manhole)	EACH	$500.00	17.10	$ 8,550.00	5.20	$ 2,600.00	67.70	$ 33,850.00	0.00	$ -	90.0	$ 45,000.00
2104.503	Remove Pipe Sewer (Storm)	LIN FT	$12.00	1,564.10	$ 18,769.20	312.45	$ 3,749.40	5,842.45	$ 70,109.40	0.00	$ -	7,719.0	$ 92,628.00
2451.609	Crushed Rock (Pipe Foundation) MnDOT 3149.2H	TON	$35.00	90.32	$ 3,161.11	17.59	$ 615.48	386.60	$ 13,530.91	0.00	$ -	494.5	$ 17,307.50
2501.502	15" RC Pipe Apron	EACH	$2,500.00	0.00	$ -	0.00	$ -	0.00	$ -	0.00	$ -	0.0	$ -
2501.502	44" RC Pipe Arch Apron	EACH	$3,500.00	0.00	$ -	0.00	$ -	1.00	$ 3,500.00	0.00	$ -	1.0	$ 3,500.00
2503.503	12" Storm Sewer Pipe	LIN FT	$95.00	1,496.45	$ 142,252.75	307.15	$ 29,179.25	3,482.40	$ 328,928.00	0.00	$ -	5,286.0	$ 500,460.00
2503.503	15" Storm Sewer Pipe	LIN FT	$100.00	240.00	$ 24,000.00	30.00	$ 3,000.00	1,233.00	$ 123,300.00	0.00	$ -	1,503.0	$ 150,300.00
2503.503	18" Storm Sewer Pipe	LIN FT	$110.00	0.00	$ -	0.00	$ -	482.00	$ 53,020.00	0.00	$ -	482.0	$ 53,020.00
2503.503	24" Storm Sewer Pipe	LIN FT	$130.00	67.90	$ 8,827.00	14.55	$ 1,891.50	1,487.55	$ 193,381.50	0.00	$ -	1,570.0	$ 204,100.00
2503.503	36" Storm Sewer Pipe	LIN FT	$200.00	0.00	$ -	0.00	$ -	675.00	$ 135,000.00	0.00	$ -	675.0	$ 135,000.00
2503.503	44" Storm Sewer ARCH Pipe	LIN FT	$300.00	0.00	$ -	0.00	$ -	525.00	$ 157,500.00	0.00	$ -	525.0	$ 157,500.00
2503.602	Connect to Existing Storm Sewer	EACH	$2,000.00	1.80	$ 3,600.00	1.95	$ 3,900.00	26.26	$ 50,500.00	0.00	$ -	29.0	$ 58,000.00
2506.502	Casting Assembly (Storm)	EACH	$1,000.00	15.60	$ 15,600.00	4.85	$ 4,850.00	88.55	$ 88,550.00	0.00	$ -	109.0	$ 109,000.00
2506.503	Construct Drainage Structure Design 48-4020	LIN FT	$800.00	23.88	$ 19,100.00	4.63	$ 3,700.00	165.00	$ 132,000.00	0.00	$ -	193.5	$ 154,800.00
2506.503	Construct Drainage Structure Design 60-4020	LIN FT	$1,200.00	9.00	$ 10,800.00	1.50	$ 1,800.00	31.50	$ 37,800.00	0.00	$ -	42.0	$ 50,400.00
2506.503	Construct Drainage Structure Design 84-4020	LIN FT	$2,000.00	0.00	$ -	0.00	$ -	32.00	$ 64,000.00	0.00	$ -	32.0	$ 64,000.00
2506.503	Construct Drainage Structure Design Special (Type 477)	LIN FT	$700.00	49.40	$ 34,580.00	18.00	$ 12,600.00	194.60	$ 136,220.00	0.00	$ -	262.0	$ 183,400.00
2573.502	Storm Drain Inlet Protection	EACH	$200.00	22.40	$ 4,480.00	9.15	$ 1,830.00	119.45	$ 23,890.00	0.00	$ -	151.0	$ 30,200.00
					$ 293,820.06		$ 69,715.63		$ 1,645,079.81		$ -		

Sanitary Sewer		**Unit**	**Unit Price**									**Est. Qty.**	**COST**
2104.502	Remove Manhole (Sanitary)	EACH	$500.00	47.00	$ 23,500.00	0.00	$ -	0.00	$ -	0.00	$ -	47.00	$ 23,500.00
2451.609	Crushed Rock (Pipe Foundation) MnDOT 3149.2H	TON	$25.00	586.90	$ 14,722.50	0.00	$ -	0.00	$ -	0.00	$ -	586.90	$ 14,722.50
2503.602	Connect to Existing Sanitary Sewer	EACH	$2,000.00	24.00	$ 48,000.00	0.00	$ -	0.00	$ -	0.00	$ -	24.00	$ 48,000.00
2502.602	4" or 6" Sanitary Sewer Clean Out (Two-Way)	EACH	$1,500.00	97.00	$ 145,500.00	0.00	$ -	0.00	$ -	0.00	$ -	97.00	$ 145,500.00
2503.602	X" x 4" PVC Wye, SDR 35	EACH	$1,500.00	161.00	$ 241,500.00	0.00	$ -	0.00	$ -	0.00	$ -	161.00	$ 241,500.00
2503.602	X" x 6" PVC Wye, SDR 35	EACH	$1,500.00	10.00	$ 15,000.00	0.00	$ -	0.00	$ -	0.00	$ -	10.00	$ 15,000.00
2503.602	Video Inspection Sewer Services (Preliminary & Post)	EACH	$150.00	98.00	$ 14,700.00	0.00	$ -	0.00	$ -	0.00	$ -	98.00	$ 14,700.00
2503.602	Clean Lateral	EACH	$300.00	97.00	$ 29,100.00	0.00	$ -	0.00	$ -	0.00	$ -	97.00	$ 29,100.00
2503.602	Sanitary Sewer Spot Repair	EACH	$5,000.00	8.00	$ 40,000.00	0.00	$ -	0.00	$ -	0.00	$ -	8.00	$ 40,000.00
2503.602	Chemical Grout Point Repair	EACH	$1,000.00	13.00	$ 13,000.00	0.00	$ -	0.00	$ -	0.00	$ -	13.00	$ 13,000.00
2503.603	Manhole Liner	LIN FT	$350.00	194.00	$ 67,900.00	0.00	$ -	0.00	$ -	0.00	$ -	194.00	$ 67,900.00
2503.603	4" Sanitary Sewer Service Pipe (Inside ROW)	LIN FT	$45.00	5,044.00	$ 226,980.00	0.00	$ -	0.00	$ -	0.00	$ -	5,044.00	$ 226,980.00
2503.603	4" Sanitary Sewer Service Pipe CIPP	LIN FT	$150.00	4,609.00	$ 691,350.00	0.00	$ -	0.00	$ -	0.00	$ -	4,609.00	$ 691,350.00
2503.603	6" PVC SDR 26 Sanitary Sewer Service Pipe (Inside ROW)	LIN FT	$50.00	309.00	$ 15,450.00	0.00	$ -	0.00	$ -	0.00	$ -	309.00	$ 15,450.00
2503.603	6" Sanitary Sewer Service Pipe CIPP	LIN FT	$160.00	783.00	$ 125,280.00	0.00	$ -	0.00	$ -	0.00	$ -	783.00	$ 125,280.00
2503.603	8" Sanitary Sewer Pipe (Regardless of Depth)	LIN FT	$90.00	12,223.00	$ 1,100,070.00	0.00	$ -	0.00	$ -	0.00	$ -	12,223.00	$ 1,100,070.00
2503.603	12" Sanitary Sewer Pipe (Regardless of Depth)	LIN FT	$125.00	682.00	$ 85,250.00	0.00	$ -	0.00	$ -	0.00	$ -	682.00	$ 85,250.00
2503.603	8" Cured-In-Place-Pipe (CIPP)	LIN FT	$50.00	3,051.00	$ 152,550.00	0.00	$ -	0.00	$ -	0.00	$ -	3,051.00	$ 152,550.00
2503.603	12" Cured-In-Place-Pipe (CIPP)	LIN FT	$65.00	2,427.00	$ 157,755.00	0.00	$ -	0.00	$ -	0.00	$ -	2,427.00	$ 157,755.00
2503.603	Clean and Televise Sanitary Sewer	LIN FT	$3.00	17,767.00	$ 53,301.00	0.00	$ -	0.00	$ -	0.00	$ -	17,767.00	$ 53,301.00
2506.502	Casting Assembly, Neenah R-1642 w/Concealed Pick Holes	EACH	$1,700.00	67.00	$ 113,900.00	0.00	$ -	0.00	$ -	0.00	$ -	67.00	$ 113,900.00
2506.602	External Manhole Seal (Sanitary)	EACH	$250.00	67.00	$ 16,750.00	0.00	$ -	0.00	$ -	0.00	$ -	67.00	$ 16,750.00
2506.603	Construct Sanitary Manhole Design 4007	LIN FT	$850.00	594.00	$ 386,100.00	0.00	$ -	0.00	$ -	0.00	$ -	594.00	$ 386,100.00
	Sanitary Sewer Subtotal				$ 3,776,898.50								$ 3,776,898.50

COST ESTIMATE - TOTAL RECONSTRUCT (STREETS, STORM, SANITARY, WATER)

	CITY ONLY COST FOR STREETS
	CITY/USDA-RD WATER-WASTEWATER-STORM SPLIT
	USDA-RD WATER/WASTEWATER ELIGIBLE
	USDA-RD 100% STORM COST

TOTAL PROJECT				Cost Split Totals								TOTAL PROJECT	
Item No	Item Description	Unit	Unit Price	Wastewater Quantity	Wastewater Cost	Water Quantity	Water Cost	Storm Quantity	Storm Cost	City Quantity	City Cost	Est. Qty	Cost
Water Main		Unit	Unit Price									Est. Qty.	COST
2104.502	Remove Gate Valve	EACH	$175.00	0.00	$ -	38.00	$ 6,650.00	0.00	$ -	0.00	$ -	38.00	$ 6,650.00
2104.502	Salvage or Remove Hydrant	EACH	$500.00	0.00	$ -	28.00	$ 14,000.00	0.00	$ -	0.00	$ -	28.00	$ 14,000.00
2104.503	Remove Water Main	LIN FT	$4.00	0.00	$ -	13,203.00	$ 52,812.00	0.00	$ -	0.00	$ -	13,203.00	$ 52,812.00
2504.601	Temporary Water	LUMP SUM	$40,000.00	0.00	$ -	1.00	$ 40,000.00	0.00	$ -	0.00	$ -	1.00	$ 40,000.00
2504.602	Connect to Existing Water Main	EACH	$3,000.00	0.00	$ -	25.00	$ 75,000.00	0.00	$ -	0.00	$ -	25.00	$ 75,000.00
2504.602	Hydrant	EACH	$8,500.00	0.00	$ -	26.00	$ 221,000.00	0.00	$ -	0.00	$ -	26.00	$ 221,000.00
2504.602	6" Gate Valve and Box	EACH	$3,500.00	0.00	$ -	68.00	$ 238,000.00	0.00	$ -	0.00	$ -	68.00	$ 238,000.00
2504.602	8" Gate Valve and Box	EACH	$4,500.00	0.00	$ -	6.00	$ 27,000.00	0.00	$ -	0.00	$ -	6.00	$ 27,000.00
2504.602	1" Corporation Stop w/Saddle	EACH	$1,000.00	0.00	$ -	161.00	$ 161,000.00	0.00	$ -	0.00	$ -	161.00	$ 161,000.00
2504.602	2" Corporation Stop w/Saddle	EACH	$1,800.00	0.00	$ -	10.00	$ 18,000.00	0.00	$ -	0.00	$ -	10.00	$ 18,000.00
2504.602	1" Curb Stop and Box	EACH	$800.00	0.00	$ -	161.00	$ 128,800.00	0.00	$ -	0.00	$ -	161.00	$ 128,800.00
2504.602	2" Curb Stop and Box	EACH	$1,600.00	0.00	$ -	10.00	$ 16,000.00	0.00	$ -	0.00	$ -	10.00	$ 16,000.00
2504.602	Lower Water Main	EACH	$7,000.00	0.00	$ -	16.00	$ 112,000.00	0.00	$ -	0.00	$ -	16.00	$ 112,000.00
2504.603	1" Service Pipe w/Tracer Wire	LIN FT	$25.00	0.00	$ -	5,044.00	$ 126,100.00	0.00	$ -	0.00	$ -	5,044.00	$ 126,100.00
2504.603	2" Service Pipe w/Tracer Wire	LIN FT	$48.00	0.00	$ -	309.00	$ 14,832.00	0.00	$ -	0.00	$ -	309.00	$ 14,832.00
2504.603	8" Water Main w/Tracer Wire	LIN FT	$70.00	0.00	$ -	13,872.00	$ 971,040.00	0.00	$ -	0.00	$ -	13,872.00	$ 971,040.00
2504.603	6" Water Main w/Trace Wire	LIN FT	$80.00	0.00	$ -	120.00	$ 9,600.00	0.00	$ -	0.00	$ -	120.00	$ 9,600.00
2504.606	Water Main Fittings	LBS	$20.00	0.00	$ -	4,850.00	$ 97,000.00	0.00	$ -	0.00	$ -	4,850.00	$ 97,000.00
2506.602	Casting Assembly (Service shut-offs in concrete)	EACH	$200.00	0.00	$ -	63.00	$ 12,600.00	0.00	$ -	0.00	$ -	63.00	$ 12,600.00
	Water Main Subtotal						$ 2,341,434.00					$	2,341,434.00
	Estimated Construction Cost Totals				$ 6,645,624		$ 5,351,585		$ 3,680,293		$ 2,279,802	$	17,957,884

Appendix 18

WTP Options Detailed Cost Estimates

Project Name:	2020 Silver Lake Water System Improvements
SEH Project No:	
Date:	June 3, 2022
Estimator:	SEH
Description:	Water Treatment Plant (Gravity Filtration)

DIVISION 1 - GENERAL REQUIREMENTS	UNIT	EST. QUANTITY	UNIT PRICE	AMOUNT
GENERAL CONDITIONS	LUMP SUM	1	$ 126,120.96	$ 126,120.96
SUBTOTAL DIVISION 0 AND 01				*$ 126,120.96*
DIVISION 2 - EXISTING CONDITIONS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
CLEARING AND GRUBBING	LUMP SUM	1	$ 5,000.00	$ 5,000.00
DEMOLISH EXISTING WELL #2 BUILDING	LUMP SUM	1	$ 8,000.00	$ 8,000.00
SUBTOTAL DIVISION 2				*$ 13,000.00*
DIVISION 3 - CONCRETE	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WTP Exterior Walls	CY	126	600	$ 75,600.00
WTP Interior Walls	CY	40	600	$ 24,000.00
WTP base slab	CY	100	600	$ 60,000.00
WTP Precast Ceiling	SF	1784	15	$ 26,760.00
FILTER Tank walls	CY	30	850	$ 25,500.00
Equipment Pads	CY	5	600	$ 3,000.00
SUBTOTAL DIVISION 3				*$ 214,860.00*
DIVISION 4 - MASONRY	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
BRICK VENEER	SQ FT	3600	$ 8.00	$ 28,800.00
CONCRETE MASONRY UNIT WALL	SQ FT	3600	$ 25.00	$ 90,000.00
SUBTOTAL DIVISION 4				*$ 118,800.00*
DIVISION 5 - METALS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
STAIRS, ALUMINUM	LUMP SUM	1	$ 5,000.00	$ 5,000.00
RAILING, ALUMINUM	LIN FT	50	$ 115.00	$ 5,750.00
METAL TRUSSES	EACH	16	$ 400.00	$ 6,400.00
STANDING SEAM METAL ROOF	SQ FT	2141	$ 10.00	$ 21,408.00
MISCELLANEOUS METALS	LUMP SUM	1	$ 12,000.00	$ 12,000.00
FRP LADDER	LF	30	$ 100.00	$ 3,000.00
SUBTOTAL DIVISION 5				*$ 53,558.00*
DIVISION 6 - WOOD, PLASTICS & COMPOSITES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PLASTIC FABRICATIONS	LUMP SUM	1	$ 10,000.00	$ 10,000.00
ROUGH CARPENTRY / WOODWORK	LUMP SUM	1	$ 5,000.00	$ 5,000.00
SUBTOTAL DIVISION 6				*$ 15,000.00*
DIVISION 7 - THERMAL & MOISTURE PROTECTION	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
INSULATION	LUMP SUM	1	$ 12,000.00	$ 12,000.00
DAMPPROOFING / WATER PROOFING	LUMP SUM	1	$ 9,000.00	$ 9,000.00
AIR BARRIER	LUMP SUM	1	$ 10,000.00	$ 10,000.00
JOINT SEALANTS	LUMP SUM	1	$ 11,000.00	$ 11,000.00
DOWNSPOUTS	LUMP SUM	1	$ 2,500.00	$ 2,500.00
SUBTOTAL DIVISION 7				*$ 44,500.00*
DIVISION 8 - OPENINGS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
FRP DOORS (SINGLE LEAF)	EACH	8	$ 3,000.00	$ 24,000.00
FRP DOORS (DOUBLE LEAF)	EACH	1	$ 6,000.00	$ 6,000.00
WINDOWS	EACH	4	$ 3,000.00	$ 12,000.00
SUBTOTAL DIVISION 8				*$ 42,000.00*
DIVISION 9 - FINISHES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WALL & CEILING PAINTING	SF	8820	$ 3.00	$ 26,460.00
CONCRETE FLOOR SEALER	SF	1820	$ 2.50	$ 4,550.00
EQUIPMENT/PROCESS PIPING PAINTING	LUMP SUM	1	$ 30,000.00	$ 30,000.00
ACOUSTIC CEILING	SF	250	$ 8.00	$ 2,000.00
SUBTOTAL DIVISION 9				*$ 63,010.00*
DIVISION 10 - SPECIALTIES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
SIGNAGE, SAFETY SPECIALTIES	LUMP SUM	1	$ 2,300.00	$ 2,300.00
SUBTOTAL DIVISON 10				*$ 2,300.00*
DIVISION 12 - FURNISHINGS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
MISC. FURNISHINGS	LUMP SUM	1	$ 1,000.00	$ 1,000.00
SUBTOTAL DIVISION 12				*$ 1,000.00*
DIVISION 22 - PLUMBING	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PLUMBING	LUMP SUM	1	$ 50,000.00	$ 50,000.00
SUBTOTAL DIVISION 22				*$ 50,000.00*
DIVISION 23 - HVAC	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**

Project Name:	**2020 Silver Lake Water System Improvements**
SEH Project No:	
Date:	**June 3, 2022**
Estimator:	**SEH**
Description:	**Water Treatment Plant (Gravity Filtration)**

HVAC	LUMP SUM	1	$ 75,000.00	$ 75,000.00
SUBTOTAL DIVISION 23				$ *75,000.00*
DIVISION 26 - ELECTRICAL	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
ELECTRICAL	LUMP SUM	1	$ 250,000.00	$ 250,000.00
INSTRUMENTATION & CONTROL	LUMP SUM	1	$ 50,000.00	$ 50,000.00
SUBTOTAL DIVISION 26				$ *300,000.00*
DIVISION 31 - EARTHWORK	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
BUILDING EXCAVATION	LUMP SUM	1	$ 90,000.00	$ 90,000.00
EROSION CONTROL	EACH	1	$ 5,000.00	$ 5,000.00
SUBTOTAL DIVISION 31				$ *95,000.00*
DIVISION 32 - EXTERIOR IMPROVEMENTS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
AGGREGATE BASE (CL 5)	LUMP SUM	1	$ 15,000.00	$ 15,000.00
COMMON EXCAVATION	LUMP SUM	1	$ 5,000.00	$ 5,000.00
4" CONCRETE SIDEWALK	SQ FT	75	$ 10.00	$ 750.00
TOPSOIL BORROW (3" DEPTH)	CU YD	100	$ 25.00	$ 2,500.00
TURF ESTABLISHMENT	LUMP SUM	1.0	$ 3,500.00	$ 3,500.00
SUBTOTAL DIVISION 32				$ *26,750.00*
DIVISION 33 - UTILITIES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WATERMAIN & SANITARY	LUMP SUM	1	$ 25,000.00	$ 25,000.00
SUBTOTAL DIVISION 33				$ *25,000.00*
DIVISION 34 - TRANSPORTATION	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
TRAFFIC CONTROL	LUMP SUM	1	$ 500.00	$ 500.00
SUBTOTAL DIVISION 34				$ *500.00*
DIVISION 40 - PROCESS INTERCONNECTIONS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PROCESS PIPING (INCLUDING NEW VALVES & OPERATORS)	LUMP SUM	1	$ 250,000.00	$ 250,000.00
SUBTOTAL DIVISION 40				$ *250,000.00*
DIVISION 43 - PROCESS GAS & LIQUID HANDLING, PURIFICATION & STORAGE EQUIPMENT	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
HIGH SERVICE PUMPS	EACH	2	$ 30,000.00	$ 60,000.00
NON-CLOG SUBMERSIBLE PUMPS (SLUDGE & RECYCLE)	EACH	2	$ 10,000.00	$ 20,000.00
MAGNETIC FLOW METERS (1 RAW, 1 FE, 1 BW, 1 SLUDGE)	LUMP SUM	1	$ 20,000.00	$ 20,000.00
SUBTOTAL DIVISION 43				$ *100,000.00*
DIVISION 44 - POLLUTION & CONTROL EQUIPMENT	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
AERATOR	LUMP SUM	1	$ 25,000.00	$ 25,000.00
PROCESS EQUIPMENT INSTALLATION	LUMP SUM	1	$ 125,000.00	$ 125,000.00
AIR SCOUR BLOWER	LUMP SUM	1	$ 20,000.00	$ 20,000.00
AIR COMPRESSOR	LUMP SUM	1	$ 16,000.00	$ 16,000.00
BACKWASH TROUGHS	EACH	3	$ 12,000.00	$ 36,000.00
FILTER UNDERDRAIN & AIR SCOUR PIPING	SF	120	$ 190.00	$ 22,800.00
GREENSAND MEDIA	CF	180	$ 85.00	$ 15,300.00
ANTHRACITE MEDIA	CF	120	$ 30.00	$ 3,600.00
FILTER MEDIA INSTALL	CF	300	$ 15.00	$ 4,500.00
FLOATING SUCTION STRAINER	LUMP SUM	1	$ 750.00	$ 750.00
CHEMICAL FEED PIPING	LUMP SUM	1	$ 15,000.00	$ 15,000.00
CHLORINE FEED SYSTEM	LUMP SUM	1	$ 10,000.00	$ 10,000.00
FLUORIDE FEED SYSTEM	LUMP SUM	1	$ 7,500.00	$ 7,500.00
PERMANGANATE SYSTEM	LUMP SUM	1	$ 10,000.00	$ 10,000.00
SUBTOTAL DIVISION 44				$ *311,450.00*
			CONSTRUCTION TOTAL	**$1,927,849**
			CONTINGENCY	**$192,780**
			TOTAL ESTIMATED CONSTRUCTION COST	**$2,120,629**
			ENGINEERING	**$385,670**
			LEGAL & ADMIN	**$48,200**
			MATERIALS TESTING	**$15,400**
			SUBTOTAL	**$2,569,799**
			INTERIM INTEREST	**$66,300**
			TOTAL ESTIMATED CAPITAL COST	**$2,636,100**

Project Name:	**2020 Silver Lake Water System Improvements**
SEH Project No:	
Date:	**June 3, 2022**
Estimator:	**SEH**
Description:	**Water Treatment Plant (Pressure Filtration)**

GENERAL REQUIREMENTS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
GENERAL CONDITIONS	LUMP SUM	1	$ 114,819.46	$ 114,819.46
SUBTOTAL DIVISION 0 AND 01				*$ 114,819.46*
DIVISION 2 - EXISTING CONDITIONS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
CLEARING AND GRUBBING	LUMP SUM	1	$ 5,000.00	$ 5,000.00
DEMOLISH EXISTING WELL #2 BUILDING	LUMP SUM	1	$ 8,000.00	$ 8,000.00
SUBTOTAL DIVISION 2				*$ 13,000.00*
DIVISION 3 - CONCRETE	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WTP Exterior Walls	CY	126	600	$ 75,600.00
WTP Interior Walls	CY	40	600	$ 24,000.00
WTP base slab	CY	100	600	$ 60,000.00
WTP Precast Ceiling	SF	1784	15	$ 26,760.00
Equipment Pads	CY	5	600	$ 3,000.00
SUBTOTAL DIVISION 3				*$ 189,360.00*
DIVISION 4 - MASONRY	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
BRICK VENEER	SQ FT	3600	$ 8.00	$ 28,800.00
CONCRETE MASONRY UNIT WALL	SQ FT	3600	$ 25.00	$ 90,000.00
SUBTOTAL DIVISION 4				*$ 118,800.00*
DIVISION 5 - METALS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
STAIRS, ALUMINUM	LUMP SUM	1	$ 5,000.00	$ 5,000.00
RAILING, ALUMINUM	LIN FT	50	$ 115.00	$ 5,750.00
METAL TRUSSES	EACH	16	$ 400.00	$ 6,400.00
STANDING SEAM METAL ROOF	SQ FT	2141	$ 10.00	$ 21,408.00
MISCELLANEOUS METALS	LUMP SUM	1	$ 12,000.00	$ 12,000.00
SUBTOTAL DIVISION 5				*$ 50,558.00*
DIVISION 6 - WOOD, PLASTICS & COMPOSITES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PLASTIC FABRICATIONS	LUMP SUM	1	$ 10,000.00	$ 10,000.00
ROUGH CARPENTRY / WOODWORK	LUMP SUM	1	$ 5,000.00	$ 5,000.00
SUBTOTAL DIVISION 6				*$ 15,000.00*
DIVISION 7 - THERMAL & MOISTURE PROTECTION	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
INSULATION	LUMP SUM	1	$ 12,000.00	$ 12,000.00
DAMPPROOFING / WATER PROOFING	LUMP SUM	1	$ 9,000.00	$ 9,000.00
AIR BARRIER	LUMP SUM	1	$ 10,000.00	$ 10,000.00
JOINT SEALANTS	LUMP SUM	1	$ 11,000.00	$ 11,000.00
DOWNSPOUTS	LUMP SUM	1	$ 2,500.00	$ 2,500.00
SUBTOTAL DIVISION 7				*$ 44,500.00*
DIVISION 8 - OPENINGS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
FRP DOORS (SINGLE LEAF)	EACH	8	$ 3,000.00	$ 24,000.00
FRP DOORS (DOUBLE LEAF)	EACH	1	$ 6,000.00	$ 6,000.00
WINDOWS	EACH	4	$ 3,000.00	$ 12,000.00
SUBTOTAL DIVISION 8				*$ 42,000.00*
DIVISION 9 - FINISHES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WALL & CEILING PAINTING	SF	8820	$ 3.00	$ 26,460.00
CONCRETE FLOOR SEALER	SF	1820	$ 2.50	$ 4,550.00
EQUIPMENT/PROCESS PIPING PAINTING	LUMP SUM	1	$ 30,000.00	$ 30,000.00
ACOUSTIC CEILING	SF	250	$ 8.00	$ 2,000.00
SUBTOTAL DIVISION 9				*$ 63,010.00*
DIVISION 10 - SPECIALTIES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
SIGNAGE, SAFETY SPECIALTIES	LUMP SUM	1	$ 2,300.00	$ 2,300.00
SUBTOTAL DIVISON 10				*$ 2,300.00*
DIVISION 12 - FURNISHINGS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
MISC. FURNISHINGS	LUMP SUM	1	$ 1,000.00	$ 1,000.00
SUBTOTAL DIVISION 12				*$ 1,000.00*
DIVISION 22 - PLUMBING	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PLUMBING	LUMP SUM	1	$ 50,000.00	$ 50,000.00
SUBTOTAL DIVISION 22				*$ 50,000.00*
DIVISION 23 - HVAC	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
HVAC	LUMP SUM	1	$ 75,000.00	$ 75,000.00
SUBTOTAL DIVISION 23				*$ 75,000.00*

Project Name: 2020 Silver Lake Water System Improvements
SEH Project No:
Date: June 3, 2022
Estimator: SEH
Description: Water Treatment Plant (Pressure Filtration)

DIVISION 26 - ELECTRICAL	UNIT	EST. QUANTITY	UNIT PRICE	AMOUNT
ELECTRICAL	LUMP SUM	1	$ 250,000.00	$ 250,000.00
INSTRUMENTATION & CONTROL	LUMP SUM	1	$ 50,000.00	$ 50,000.00
SUBTOTAL DIVISION 26				*$ 300,000.00*
DIVISION 31 - EARTHWORK	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
BUILDING EXCAVATION	LUMP SUM	1	$ 50,000.00	$ 50,000.00
EROSION CONTROL	EACH	1	$ 5,000.00	$ 5,000.00
SUBTOTAL DIVISION 31				*$ 55,000.00*
DIVISION 32 - EXTERIOR IMPROVEMENTS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
AGGREGATE BASE (CL 5)	LUMP SUM	1	$ 15,000.00	$ 15,000.00
COMMON EXCAVATION	LUMP SUM	1	$ 5,000.00	$ 5,000.00
4" CONCRETE SIDEWALK	SQ FT	75	$ 10.00	$ 750.00
TOPSOIL BORROW (3" DEPTH)	CU YD	100	$ 25.00	$ 2,500.00
TURF ESTABLISHMENT	LUMP SUM	1.0	$ 3,500.00	$ 3,500.00
SUBTOTAL DIVISION 32				*$ 26,750.00*
DIVISION 33 - UTILITIES	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
WATERMAIN & SANITARY	LUMP SUM	1	$ 25,000.00	$ 25,000.00
SUBTOTAL DIVISION 33				*$ 25,000.00*
DIVISION 34 - TRANSPORTATION	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
TRAFFIC CONTROL	LUMP SUM	1	$ 500.00	$ 500.00
SUBTOTAL DIVISION 34				*$ 500.00*
DIVISION 40 - PROCESS INTERCONNECTIONS	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PROCESS PIPING	LUMP SUM	1	$ 100,000.00	$ 100,000.00
SUBTOTAL DIVISION 40				*$ 100,000.00*
DIVISION 43 - PROCESS GAS & LIQUID HANDLING, PURIFICATION & STORAGE EQUIPMENT	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
SLUDGE PUMPS	EACH	2	$ 10,000.00	$ 20,000.00
MAGNETIC FLOW METERS (1 RAW, 1 FE, 1 BW, 1 SLUDGE)	LUMP SUM	1	$ 20,000.00	$ 20,000.00
SUBTOTAL DIVISION 43				*$ 40,000.00*
DIVISION 44 - POLLUTION & CONTROL EQUIPMENT	**UNIT**	**EST. QUANTITY**	**UNIT PRICE**	**AMOUNT**
PRESSURE FILTER, MEDIA, FACE PIPING & VALVES	LUMP SUM	1	$ 220,000.00	$ 220,000.00
PRESSURE AERATOR	LUMP SUM	1	$ 30,000.00	$ 30,000.00
PROCESS EQUIPMENT INSTALLATION	LUMP SUM	1	$ 100,000.00	$ 100,000.00
AIR SCOUR BLOWER	LUMP SUM	1	$ 20,000.00	$ 20,000.00
AIR COMPRESSOR	LUMP SUM	1	$ 16,000.00	$ 16,000.00
CHEMICAL FEED PIPING	LUMP SUM	1	$ 15,000.00	$ 15,000.00
CHLORINE FEED SYSTEM	LUMP SUM	1	$ 10,000.00	$ 10,000.00
FLUORIDE FEED SYSTEM	LUMP SUM	1	$ 7,500.00	$ 7,500.00
PERMANGANATE SYSTEM	LUMP SUM	1	$ 10,000.00	$ 10,000.00
SUBTOTAL DIVISION 44				*$ 428,500.00*
			CONSTRUCTION TOTAL	$1,765,097
			CONTINGENCY	$175,510
			TOTAL ESTIMATED CONSTRUCTION COST	$1,930,607
			ENGINEERING	$361,020
			LEGAL & ADMI	$43,900
			MATERIALS TESTING	$14,000
			SUBTOTAL	$2,339,627
			INTERIM INTEREST	$60,400
			TOTAL ESTIMATED CAPITAL COST	$2,400,000

Appendix 19

Public Hearing Minutes

SEH

Building a Better World for All of Us®

MEETING MINUTES

RE: Silver Lake PER/ER Public Hearing
Silver Lake, MN

Date of Meeting: Thursday June 4, 2020

Project Manager: John Rodeberg, PE

Time of Meeting: 6 p.m.

SEH No.: SILAK 152875 16.00

Location of Meeting: Silver Lake Auditorium

ATTENDEES:		
	John Rodeberg	SEH
	Jordan Van Oort	SEH
	Shannon Sweeney	David Drown Associates
	Jon Jerabek	City Clerk/Treasurer
	Karissa Wicklund-Kurth	Deputy Clerk
	Chris Penaz	City Council
	Josh Winfrey	City Council
	Nolan Johnson	City Council
	Dorothy Butler	Mayor

The meeting was broadcast online due to Covid-19, with questions taken by Jon Jerabek via email, phone and web.

The following items were discussed at the above referenced meeting:

I. John Rodeberg gave a presentation on the background of the project, project scope, USDA Rural Development process, and key project drivers. PDF copies of the presentation are available upon request. Special focus was given to the following:
   A. It was noted that one major goal of the presentation was to get feedback from the public regarding the proposed scope of the project, including identification of issues or concerns that should be addressed.
   B. It was noted that the Water Tower is eligible for historic designation, and part of the review process includes getting feedback on what the community wants to do with the tower. It was requested that community members respond to the request for their thoughts and opinions.

II. Questions
   A. What type of traffic will the reconstructed streets be designed for?
      1. Response – Most residential streets will be a 7-ton design, but truck routes will be a 10-ton design.
   B. Will there be assessments related to the project?
      1. Response – Yes, there will be assessments to owners who have improvements adjacent to their property. Examples would be new street, sewer, water, and storm sewer. Assessments will be based on city's assessment policy.
   C. Will there be utility rate increases?
      1. Response – The city raised rates last year to levels comparable to other communities who have needed to finance infrastructure projects. USDA-Rural Development and the City will review and determine what the appropriate rates are as part of the process. We don't know if further rate increases will be required as a condition of the project, but if there are increases it is not anticipated that they are likely to be substantial.

D. When will the city need to make a decision regarding the existing water tower and new storage options?
   1. Response – Decisions on individual elements of the project will need to be made after USDA issues a letter of conditions. This letter will specify how much grant and loan funding are available for the city related to sanitary, water and storm sewer.

E. How should the city get feedback from the residents regarding issues like the water tower?
   1. Response – Each city and situation is different regarding best ways to engage the public. Some suggestions are letters, surveys attached to utility bills, public meetings etc. If there are survey questions, we recommend a careful choice of questions and wording to avoid swaying response.

F. If the existing water tower were de-commissioned from use but allowed to stay as a landmark or sculpture, would there still be on-going maintenance costs?
   1. Response – There will still be maintenance costs, but they would be significantly less than the required maintenance to keep the tower in use for water storage.

G. Would Gehlen Ave homes have new services installed?
   1. Response – We have planned for replacement of clay sanitary main. The existing 4" watermain is a dead end. Since there are only a few homes served, leaving the 4" watermain in place is likely preferable, but will be reviewed during final project design. Replacing with a larger watermain would increase the time the water sits in the dead-end pipe before use, and this could lead to additional aesthetic concerns with the water.

H. Is watermain looping part of the project scope?
   1. Response – After discussions with city staff, it was determined that looping the few watermain stubs is likely not needed, and is not expected to be part of the project. Increasing the size of some watermain to provide adequate service is proposed in specific areas.

I. Will there be any fees/costs that will not be funded by RD?
   1. Response – Water and sanitary sewer costs are eligible for RD funding. Some street and storm sewer costs cannot be funded by RD, and other funding sources will be utilized. We will have a clearer picture of funding after USDA issues the letter of conditions.

J. Are there plans for replacing force mains?
   1. Response – The forcemain from the Cleveland lift/pump station will be replaced. The forcemain from the Main lift station to the treatment ponds appears to be in good condition and will remain in place.

SEH believes that this document accurately reflects the business transacted during the meeting. If any attendee believes that there are any inconsistencies, omissions or errors in the minutes, they should notify the writer at once. Unless objections are raised within seven (7) days, we will consider this account accurate and acceptable to all.

If there are errors contained in this document, or if relevant information has been omitted, please contact John Rodeberg, PE at 651.470.2448 or Jordan Van Oort at 952.836.4018..

c: Attendees

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Appendix 20

DMR Reports (Raw Data)

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Ver. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	9/1/2016		0.00	N
MNG580164	WS 001	pH	400	SU	9/1/2016		7.2	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	9/1/2016		39	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	9/1/2016		0.70	N
MNG580164	WS 001	Flow	50050	mgd	9/1/2016		0.26	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/1/2016		18	N
MNG580164	WS 001	Precipitation	193	in	9/2/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/2/2016		0.25	N
MNG580164	WS 001	Precipitation	193	in	9/3/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/3/2016		0.24	N
MNG580164	WS 001	Precipitation	193	in	9/4/2016		0.7	N
MNG580164	WS 001	Flow	50050	mgd	9/4/2016		0.24	N
MNG580164	WS 001	Precipitation	193	in	9/5/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/5/2016		0.26	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	9/6/2016		12.1	N
MNG580164	SD 003	pH	400	SU	9/6/2016		7.2	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	9/6/2016		19	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	9/6/2016		1.25	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	9/6/2016		140	N
MNG580164	SD 003	Flow	50050	mgd	9/6/2016		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/6/2016		5	N
MNG580164	WS 001	Precipitation	193	in	9/6/2016		0.5	N
MNG580164	WS 001	Flow	50050	mgd	9/6/2016		0.30	N
MNG580164	SD 003	Flow	50050	mgd	9/7/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/7/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/7/2016		0.26	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	9/8/2016		12	N
MNG580164	SD 003	pH	400	SU	9/8/2016		7.2	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	9/8/2016		22	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	9/8/2016		1.29	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	9/8/2016		90	N
MNG580164	SD 003	Flow	50050	mgd	9/8/2016		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/8/2016		7	N
MNG580164	WS 001	Precipitation	193	in	9/8/2016		0.1	N
MNG580164	WS 001	Flow	50050	mgd	9/8/2016		0.24	N
MNG580164	SD 003	Flow	50050	mgd	9/9/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/9/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/9/2016		0.21	N
MNG580164	SD 003	Flow	50050	mgd	9/10/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/10/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/10/2016		0.20	N
MNG580164	SD 003	Flow	50050	mgd	9/11/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/11/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/11/2016		0.20	N
MNG580164	SD 003	Flow	50050	mgd	9/12/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/12/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/12/2016		0.18	N
MNG580164	SD 003	Flow	50050	mgd	9/13/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/13/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/13/2016		0.17	N
MNG580164	SD 003	Flow	50050	mgd	9/14/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/14/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/14/2016		0.16	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	9/15/2016		11.9	N
MNG580164	SD 003	pH	400	SU	9/15/2016		7.2	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	9/15/2016		42	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	9/15/2016	<	0.16	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	9/15/2016		4	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	9/15/2016	<	0.05	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	9/15/2016		1.55	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	9/15/2016		63	N
MNG580164	SD 003	Flow	50050	mgd	9/15/2016		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/15/2016		10	N
MNG580164	WS 001	Precipitation	193	in	9/15/2016		0.6	N
MNG580164	WS 001	Flow	50050	mgd	9/15/2016		0.19	N
MNG580164	SD 003	Flow	50050	mgd	9/16/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/16/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/16/2016		0.17	N
MNG580164	SD 003	Flow	50050	mgd	9/17/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	9/17/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/17/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/18/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/18/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/19/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/19/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	9/20/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/20/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/21/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/21/2016		0.22	N
MNG580164	WS 001	Precipitation	193	in	9/22/2016		0.3	N
MNG580164	WS 001	Flow	50050	mgd	9/22/2016		0.08	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	9/23/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/23/2016		0.20	N
MNG580164	WS 001	Precipitation	193	in	9/24/2016		0.7	N
MNG580164	WS 001	Flow	50050	mgd	9/24/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/25/2016		1	N
MNG580164	WS 001	Flow	50050	mgd	9/25/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/26/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/26/2016		0.39	N
MNG580164	WS 001	Precipitation	193	in	9/27/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/27/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/28/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/28/2016		0.22	N
MNG580164	WS 001	Precipitation	193	in	9/29/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/29/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/30/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	9/30/2016		0.33	N
MNG580164	WS 001	Precipitation	193	in	10/1/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/1/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/2/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/2/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/3/2016		0.05	N
MNG580164	WS 001	Flow	50050	mgd	10/3/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	10/4/2016		0.63	N
MNG580164	WS 001	Flow	50050	mgd	10/4/2016		0.22	N
MNG580164	WS 001	Precipitation	193	in	10/5/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/5/2016		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/6/2016		0.7	N
MNG580164	WS 001	Flow	50050	mgd	10/6/2016		0.21	N
MNG580164	WS 001	Precipitation	193	in	10/7/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/7/2016		0.37	N
MNG580164	WS 001	Precipitation	193	in	10/8/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/8/2016		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/9/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/9/2016		0.24	N
MNG580164	WS 001	Precipitation	193	in	10/10/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/10/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/11/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/11/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/12/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/12/2016		0.21	N
MNG580164	WS 001	Precipitation	193	in	10/13/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/13/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/14/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/14/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/15/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/15/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/16/2016		0.3	N
MNG580164	WS 001	Flow	50050	mgd	10/16/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/17/2016		0.23	N
MNG580164	WS 001	Flow	50050	mgd	10/17/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/18/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/18/2016		0.18	N
MNG580164	WS 001	Precipitation	193	in	10/19/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/19/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/20/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/20/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/21/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/21/2016		0.11	N
MNG580164	WS 001	Precipitation	193	in	10/22/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/22/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/23/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/23/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	10/24/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/24/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	10/25/2016		0.75	N
MNG580164	WS 001	Flow	50050	mgd	10/25/2016		0.18	N
MNG580164	WS 001	Precipitation	193	in	10/26/2016		0.04	N
MNG580164	WS 001	Flow	50050	mgd	10/26/2016		0.28	N
MNG580164	WS 001	Precipitation	193	in	10/27/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/27/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/28/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/28/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/29/2016		0.09	N
MNG580164	WS 001	Flow	50050	mgd	10/29/2016		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/30/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	10/30/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/31/2016		0.03	N
MNG580164	WS 001	Flow	50050	mgd	10/31/2016		0.16	N
MNG580164	WS 001	Precipitation	193	in	11/1/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/1/2016		0.17	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/2/2016		6.1	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	SD 003	pH	400	SU	11/2/2016		8	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/2/2016		4	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/2/2016		1.61	N
MNG580164	SD 003	Flow	50050	mgd	11/2/2016		1.32	N
MNG580164	SD 003	Solids, Total Dissolved (TDS)	70295	mg/L	11/2/2016		752	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/2/2016		1.4	N
MNG580164	WS 001	Precipitation	193	in	11/2/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/2/2016		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/3/2016		9.1	N
MNG580164	SD 003	pH	400	SU	11/3/2016		8.3	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/3/2016		4	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/3/2016		1.47	N
MNG580164	SD 003	Flow	50050	mgd	11/3/2016		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/3/2016		2	N
MNG580164	WS 001	Precipitation	193	in	11/3/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/3/2016		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/4/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/4/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/4/2016		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/5/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/5/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/5/2016		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/6/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/6/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/6/2016		0.17	N
MNG580164	SD 003	Flow	50050	mgd	11/7/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/7/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/7/2016		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/8/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/8/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/8/2016		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/9/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/9/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/9/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/10/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/10/2016		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/11/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/11/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/12/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/12/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/13/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/13/2016		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/14/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/14/2016		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/15/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/15/2016		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/16/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/16/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/17/2016		0.07	N
MNG580164	WS 001	Flow	50050	mgd	11/17/2016		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/18/2016		0.59	N
MNG580164	WS 001	Flow	50050	mgd	11/18/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/19/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/19/2016		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/20/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/20/2016		0.17	N
MNG580164	WS 001	Precipitation	193	in	11/21/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/21/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/22/2016		0.68	N
MNG580164	WS 001	Flow	50050	mgd	11/22/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/23/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/23/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/24/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/24/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	11/25/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/25/2016		0.18	N
MNG580164	WS 001	Precipitation	193	in	11/26/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/26/2016		0.20	N
MNG580164	WS 001	Precipitation	193	in	11/27/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/27/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	11/28/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/28/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	11/29/2016		0.09	N
MNG580164	WS 001	Flow	50050	mgd	11/29/2016		0.23	N
MNG580164	WS 001	Precipitation	193	in	11/30/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	11/30/2016		0.19	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/1/2016		10.4	N
MNG580164	SD 003	pH	400	SU	12/1/2016		8.5	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/1/2016		14	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/1/2016		1.42	N
MNG580164	SD 003	Flow	50050	mgd	12/1/2016		1.32	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/1/2016		8	N
MNG580164	WS 001	Precipitation	193	in	12/1/2016		0	N
MNG580164	WS 001	pH	400	SU	12/1/2016		8.1	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	12/1/2016		150	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	12/1/2016		2.32	N
MNG580164	WS 001	Flow	50050	mgd	12/1/2016		0.19	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/1/2016		54	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/2/2016		10.3	N
MNG580164	SD 003	pH	400	SU	12/2/2016		8.4	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/2/2016		15	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/2/2016		1.52	N
MNG580164	SD 003	Flow	50050	mgd	12/2/2016		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/2/2016		7.2	N
MNG580164	WS 001	Precipitation	193	in	12/2/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/2/2016		0.19	N
MNG580164	SD 003	Flow	50050	mgd	12/3/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/3/2016		0.15	N
MNG580164	WS 001	Flow	50050	mgd	12/3/2016		0.18	N
MNG580164	SD 003	Flow	50050	mgd	12/4/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/4/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/4/2016		0.22	N
MNG580164	SD 003	Flow	50050	mgd	12/5/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/5/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/5/2016		0.19	N
MNG580164	SD 003	Flow	50050	mgd	12/6/2016		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/6/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/6/2016		0.19	N
MNG580164	WS 001	Precipitation	193	in	12/7/2016		0.01	N
MNG580164	WS 001	Flow	50050	mgd	12/7/2016		0.17	N
MNG580164	WS 001	Precipitation	193	in	12/8/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/8/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	12/9/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/9/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/10/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/10/2016		0.18	N
MNG580164	WS 001	Precipitation	193	in	12/11/2016		0.38	N
MNG580164	WS 001	Flow	50050	mgd	12/11/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/12/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/12/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	12/13/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/13/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/14/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/14/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/15/2016		0.08	N
MNG580164	WS 001	Flow	50050	mgd	12/15/2016		0.12	N
MNG580164	WS 001	Precipitation	193	in	12/16/2016		0.32	N
MNG580164	WS 001	Flow	50050	mgd	12/16/2016		0.17	N
MNG580164	WS 001	Precipitation	193	in	12/17/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/17/2016		0.11	N
MNG580164	WS 001	Precipitation	193	in	12/18/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/18/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	12/19/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/19/2016		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/20/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/20/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	12/21/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/21/2016		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/22/2016		0.02	N
MNG580164	WS 001	Flow	50050	mgd	12/22/2016		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/23/2016		0.01	N
MNG580164	WS 001	Flow	50050	mgd	12/23/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	12/24/2016		0.85	N
MNG580164	WS 001	Flow	50050	mgd	12/24/2016		0.13	N
MNG580164	WS 001	Precipitation	193	in	12/25/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/25/2016		0.21	N
MNG580164	WS 001	Precipitation	193	in	12/26/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/26/2016		0.20	N
MNG580164	WS 001	Precipitation	193	in	12/27/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/27/2016		0.22	N
MNG580164	WS 001	Precipitation	193	in	12/28/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/28/2016		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/29/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/29/2016		0.17	N
MNG580164	WS 001	Precipitation	193	in	12/30/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/30/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	12/31/2016		0	N
MNG580164	WS 001	Flow	50050	mgd	12/31/2016		0.15	N
MNG580164	WS 001	Precipitation	193	in	1/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/1/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	1/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/2/2017		0.17	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	1/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/3/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	1/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/4/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/5/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	1/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/6/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	1/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/7/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	1/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/8/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/9/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/10/2017		0.3	N
MNG580164	WS 001	Flow	50050	mgd	1/10/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/11/2017		0.08	N
MNG580164	WS 001	Flow	50050	mgd	1/11/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/12/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/13/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/14/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/15/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/16/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/17/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/18/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/19/2017		0.12	N
MNG580164	WS 001	Flow	50050	mgd	1/19/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/20/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	1/20/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/21/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	1/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/22/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	1/23/2017		0.09	N
MNG580164	WS 001	Flow	50050	mgd	1/23/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	1/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/24/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/25/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	1/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/26/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	1/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/27/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/28/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	1/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/29/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	1/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/30/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	1/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	1/31/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	2/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/1/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	2/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/2/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	2/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/3/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	2/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/4/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	2/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/5/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	2/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/6/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/7/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	2/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/8/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/9/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/10/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/10/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/11/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	2/11/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	2/12/2017		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'Y', 'S')
MNG580164	WS 001	Flow	50050	mgd	2/12/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	2/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/13/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	2/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/14/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/15/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/16/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	2/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/17/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	2/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/18/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	2/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/19/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	2/20/2017		0.22	N
MNG580164	WS 001	Flow	50050	mgd	2/20/2017		0.23	N
MNG580164	WS 001	Precipitation	193	in	2/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/21/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	2/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/22/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	2/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/23/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	2/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/24/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	2/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/25/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	2/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/26/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	2/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/27/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	2/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	2/28/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	3/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/1/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/2/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	3/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/3/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/4/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/5/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	3/6/2017		0.18	N
MNG580164	WS 001	Flow	50050	mgd	3/6/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/7/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	3/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/8/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/9/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/10/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/10/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/11/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	3/12/2017		0.2	N
MNG580164	WS 001	Flow	50050	mgd	3/12/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/13/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/14/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	3/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/15/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/16/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/17/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/18/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	3/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/19/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/20/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/21/2017		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	3/22/2017		22.5	N
MNG580164	SD 003	pH	400	SU	3/22/2017		8.9	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	3/22/2017		34	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	3/22/2017		2.2	N
MNG580164	SD 003	Flow	50050	mgd	3/22/2017		0.66	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	3/22/2017		21	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	3/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/22/2017		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	3/23/2017		23.3	N
MNG580164	SD 003	pH	400	SU	3/23/2017		8.9	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	3/23/2017		31	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	3/23/2017		2.3	N
MNG580164	SD 003	Flow	50050	mgd	3/23/2017		0.66	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	3/23/2017		37	N
MNG580164	WS 001	Precipitation	193	in	3/23/2017		0.18	N
MNG580164	WS 001	pH	400	SU	3/23/2017		8.05	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	3/23/2017		108	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	3/23/2017		3.37	N
MNG580164	WS 001	Flow	50050	mgd	3/23/2017		0.15	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	3/23/2017		57	N
MNG580164	SD 003	Flow	50050	mgd	3/24/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	3/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/24/2017		0.11	N
MNG580164	SD 003	Flow	50050	mgd	3/25/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	3/25/2017		0.07	N
MNG580164	WS 001	Flow	50050	mgd	3/25/2017		0.15	N
MNG580164	SD 003	Flow	50050	mgd	3/26/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	3/26/2017		0.04	N
MNG580164	WS 001	Flow	50050	mgd	3/26/2017		0.16	N
MNG580164	SD 003	Flow	50050	mgd	3/27/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	3/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/27/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/28/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	3/29/2017		0.1	N
MNG580164	WS 001	Flow	50050	mgd	3/29/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/30/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	3/31/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	4/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/1/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	4/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/2/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	4/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/3/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	4/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/4/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	4/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/5/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	4/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/6/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	4/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/7/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	4/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/8/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	4/9/2017		0.08	N
MNG580164	WS 001	Flow	50050	mgd	4/9/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	4/10/2017		0.41	N
MNG580164	WS 001	Flow	50050	mgd	4/10/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	4/11/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	4/11/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	4/12/2017		0.17	N
MNG580164	WS 001	Flow	50050	mgd	4/12/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	4/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/13/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	4/14/2017		0.43	N
MNG580164	WS 001	Flow	50050	mgd	4/14/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	4/15/2017		0.18	N
MNG580164	WS 001	Flow	50050	mgd	4/15/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	4/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/16/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	4/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/17/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	4/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/18/2017		0.21	N
MNG580164	WS 001	Precipitation	193	in	4/19/2017		0.62	N
MNG580164	WS 001	Flow	50050	mgd	4/19/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/20/2017		0.25	N
MNG580164	WS 001	Precipitation	193	in	4/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/21/2017		0.21	N
MNG580164	WS 001	Precipitation	193	in	4/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/22/2017		0.28	N
MNG580164	WS 001	Precipitation	193	in	4/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/23/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/24/2017		0.03	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reportad Value	Var. of Op. ('N', 'I', 'S')
MNG580164	WS 001	Flow	50050	mgd	4/24/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	4/25/2017		0.81	N
MNG580164	WS 001	Flow	50050	mgd	4/25/2017		0.27	N
MNG580164	WS 001	Precipitation	193	in	4/26/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	4/26/2017		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/27/2017		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/28/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	4/29/2017		0.24	N
MNG580164	WS 001	Precipitation	193	in	4/30/2017		1.16	N
MNG580164	WS 001	Flow	50050	mgd	4/30/2017		0.91	N
MNG580164	WS 001	Precipitation	193	in	5/1/2017		0.14	N
MNG580164	WS 001	Flow	50050	mgd	5/1/2017		0.47	N
MNG580164	WS 001	Precipitation	193	in	5/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/2/2017		0.27	N
MNG580164	WS 001	Precipitation	193	in	5/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/3/2017		0.32	N
MNG580164	WS 001	Precipitation	193	in	5/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/4/2017		0.36	N
MNG580164	WS 001	Precipitation	193	in	5/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/5/2017		0.26	N
MNG580164	WS 001	Precipitation	193	in	5/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/6/2017		0.23	N
MNG580164	WS 001	Precipitation	193	in	5/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/7/2017		0.24	N
MNG580164	WS 001	Precipitation	193	in	5/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/8/2017		0.24	N
MNG580164	WS 001	Precipitation	193	in	5/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/9/2017		0.19	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/10/2017		1.53	N
MNG580164	SD 003	pH	400	SU	5/10/2017		8.3	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/10/2017		9	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/10/2017		2.3	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/10/2017		6	N
MNG580164	SD 003	Flow	50050	mgd	5/10/2017		0.66	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/10/2017		10	N
MNG580164	WS 001	Precipitation	193	in	5/10/2017		0.04	N
MNG580164	WS 001	Flow	50050	mgd	5/10/2017		0.20	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/11/2017		1.17	N
MNG580164	SD 003	pH	400	SU	5/11/2017		8.3	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/11/2017		5	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/11/2017		2.27	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/11/2017		9	N
MNG580164	SD 003	Flow	50050	mgd	5/11/2017		0.66	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/11/2017		3.2	N
MNG580164	WS 001	Precipitation	193	in	5/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/11/2017		0.21	N
MNG580164	SD 003	Flow	50050	mgd	5/12/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/12/2017		0.16	N
MNG580164	SD 003	Flow	50050	mgd	5/13/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/13/2017		0.20	N
MNG580164	SD 003	Flow	50050	mgd	5/14/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/14/2017		0.20	N
MNG580164	SD 003	Flow	50050	mgd	5/15/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/15/2017		0.4	N
MNG580164	WS 001	Flow	50050	mgd	5/15/2017		0.14	N
MNG580164	SD 003	Flow	50050	mgd	5/16/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/16/2017		0.58	N
MNG580164	WS 001	Flow	50050	mgd	5/16/2017		0.20	N
MNG580164	SD 003	Flow	50050	mgd	5/17/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	5/17/2017		0.94	N
MNG580164	WS 001	Flow	50050	mgd	5/17/2017		0.30	N
MNG580164	WS 001	Precipitation	193	in	5/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/18/2017		0.27	N
MNG580164	WS 001	Precipitation	193	in	5/19/2017		0.7	N
MNG580164	WS 001	Flow	50050	mgd	5/19/2017		0.43	N
MNG580164	WS 001	Precipitation	193	in	5/20/2017		1.03	N
MNG580164	WS 001	Flow	50050	mgd	5/20/2017		0.51	N
MNG580164	WS 001	Precipitation	193	in	5/21/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	5/21/2017		0.25	N
MNG580164	WS 001	Precipitation	193	in	5/22/2017		0.05	N
MNG580164	WS 001	Flow	50050	mgd	5/22/2017		0.41	N
MNG580164	WS 001	Precipitation	193	in	5/23/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	5/23/2017		0.25	N
MNG580164	WS 001	Precipitation	193	in	5/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/24/2017		0.29	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	5/25/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	5/25/2017		0.26	N
MNG580164	WS 001	Precipitation	193	in	5/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/26/2017		0.21	N
MNG580164	WS 001	Precipitation	193	in	5/27/2017		0.06	N
MNG580164	WS 001	Flow	50050	mgd	5/27/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	5/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/28/2017		0.22	N
MNG580164	WS 001	Precipitation	193	in	5/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/29/2017		0.22	N
MNG580164	WS 001	Precipitation	193	in	5/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/30/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	5/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	5/31/2017		0.21	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	6/1/2017		4.22	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	6/1/2017		6.36	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	6/1/2017		0.99	N
MNG580164	WS 001	Precipitation	193	in	6/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/1/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/2/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	6/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/3/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	6/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/4/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	6/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/5/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	6/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/6/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	6/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/7/2017		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	6/8/2017		0.9	N
MNG580164	SD 003	pH	400	SU	6/8/2017		8.1	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	6/8/2017		5	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	6/8/2017		4	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	6/8/2017		2420	N
MNG580164	SD 003	Flow	50050	mgd	6/8/2017		0.66	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	6/8/2017		5.8	N
MNG580164	WS 001	Precipitation	193	in	6/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/8/2017		0.11	N
MNG580164	SD 003	Flow	50050	mgd	6/9/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	6/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/9/2017		0.11	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	6/10/2017		8	N
MNG580164	SD 003	Flow	50050	mgd	6/10/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	6/10/2017		1.39	N
MNG580164	WS 001	Flow	50050	mgd	6/10/2017		0.20	N
MNG580164	SD 003	Flow	50050	mgd	6/11/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	6/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/11/2017		0.20	N
MNG580164	SD 003	Flow	50050	mgd	6/12/2017		0.66	N
MNG580164	WS 001	Precipitation	193	in	6/12/2017		0.08	N
MNG580164	WS 001	Flow	50050	mgd	6/12/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	6/13/2017		0.14	N
MNG580164	WS 001	Flow	50050	mgd	6/13/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	6/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/14/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	6/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/15/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/16/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/17/2017		0.3	N
MNG580164	WS 001	Flow	50050	mgd	6/17/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/18/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/19/2017		0.04	N
MNG580164	WS 001	Flow	50050	mgd	6/19/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/20/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/21/2017		0.24	N
MNG580164	WS 001	pH	400	SU	6/21/2017		7.4	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	6/21/2017		128	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	6/21/2017		4.48	N
MNG580164	WS 001	Flow	50050	mgd	6/21/2017		0.23	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	6/21/2017		80	N
MNG580164	WS 001	Precipitation	193	in	6/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/22/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	6/23/2017		0.07	N
MNG580164	WS 001	Flow	50050	mgd	6/23/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	6/24/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	6/24/2017		0.11	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ['<' or '>']	Reported Value	Var. of Op. ['N', 'I', 'S']
MNG580164	WS 001	Precipitation	193	in	6/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/25/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	6/26/2017		0.42	N
MNG580164	WS 001	Flow	50050	mgd	6/26/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	6/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/27/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/28/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/29/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	6/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	6/30/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/1/2017		0.03	N
MNG580164	WS 001	Flow	50050	mgd	7/1/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/2/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/3/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/4/2017		1.34	N
MNG580164	WS 001	Flow	50050	mgd	7/4/2017		0.21	N
MNG580164	WS 001	Precipitation	193	in	7/5/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	7/5/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/6/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/7/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/8/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/9/2017		0.32	N
MNG580164	WS 001	Flow	50050	mgd	7/9/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/10/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/10/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/11/2017		0.33	N
MNG580164	WS 001	Flow	50050	mgd	7/11/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/12/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/13/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/14/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/15/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/16/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/17/2017		0.8	N
MNG580164	WS 001	Flow	50050	mgd	7/17/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/18/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	7/19/2017		0.44	N
MNG580164	WS 001	Flow	50050	mgd	7/19/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/20/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	7/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/21/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/22/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/23/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/24/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/25/2017		0.95	N
MNG580164	WS 001	Flow	50050	mgd	7/25/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/26/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/27/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/28/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/29/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/30/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	7/31/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/1/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/2/2017		0.54	N
MNG580164	WS 001	Flow	50050	mgd	8/2/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/3/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	8/3/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/4/2017		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	8/4/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/5/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/6/2017		0.19	N
MNG580164	WS 001	Flow	50050	mgd	8/6/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/7/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/8/2017		0.37	N
MNG580164	WS 001	Precipitation	193	in	8/9/2017		0.81	N
MNG580164	WS 001	Flow	50050	mgd	8/9/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/10/2017		0.08	N
MNG580164	WS 001	Flow	50050	mgd	8/10/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/11/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/12/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/13/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	8/14/2017		0.54	N
MNG580164	WS 001	Flow	50050	mgd	8/14/2017		0.07	N
MNG580164	WS 001	Precipitation	193	in	8/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/15/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/16/2017		0.93	N
MNG580164	WS 001	Precipitation	193	in	8/17/2017		1.83	N
MNG580164	WS 001	Flow	50050	mgd	8/17/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	8/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/18/2017		0.23	N
MNG580164	WS 001	Precipitation	193	in	8/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/19/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/20/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	8/21/2017		0.15	N
MNG580164	WS 001	Flow	50050	mgd	8/21/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	8/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/22/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/23/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/24/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/25/2017		0.89	N
MNG580164	WS 001	Flow	50050	mgd	8/25/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	8/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/26/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/27/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	8/27/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	8/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/28/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	8/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/29/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/30/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	8/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	8/31/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/1/2017		0.03	N
MNG580164	WS 001	Flow	50050	mgd	9/1/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	9/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/2/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/3/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/4/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/5/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/6/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/7/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/8/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/9/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/10/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/10/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/11/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/12/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/13/2017		0	N
MNG580164	WS 001	pH	400	SU	9/13/2017		7.69	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	9/13/2017		176	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	9/13/2017		5.39	N
MNG580164	WS 001	Flow	50050	mgd	9/13/2017		0.10	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/13/2017		157	N
MNG580164	WS 001	Precipitation	193	in	9/14/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/14/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/15/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	9/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/16/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/17/2017		0.29	N
MNG580164	WS 001	Flow	50050	mgd	9/17/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/18/2017		0.03	N
MNG580164	WS 001	Flow	50050	mgd	9/18/2017		0.05	N
MNG580164	WS 001	Precipitation	193	in	9/19/2017		0.19	N
MNG580164	WS 001	Flow	50050	mgd	9/19/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/20/2017		0.07	N
MNG580164	WS 001	Precipitation	193	in	9/21/2017		0.29	N
MNG580164	WS 001	Flow	50050	mgd	9/21/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	9/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/22/2017		0.06	N
MNG580164	WS 001	Precipitation	193	in	9/23/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	9/23/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/24/2017		0.9	N
MNG580164	WS 001	Flow	50050	mgd	9/24/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/25/2017		0.23	N
MNG580164	WS 001	Flow	50050	mgd	9/25/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/26/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/27/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/28/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/29/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	9/30/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/1/2017		1.1	N
MNG580164	WS 001	Flow	50050	mgd	10/1/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/2/2017		3.5	N
MNG580164	WS 001	Flow	50050	mgd	10/2/2017		0.79	N
MNG580164	WS 001	Precipitation	193	in	10/3/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	10/3/2017		0.75	N
MNG580164	WS 001	Precipitation	193	in	10/4/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/4/2017		0.38	N
MNG580164	WS 001	Precipitation	193	in	10/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/5/2017		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/6/2017		0.65	N
MNG580164	WS 001	Flow	50050	mgd	10/6/2017		0.31	N
MNG580164	WS 001	Precipitation	193	in	10/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/7/2017		0.38	N
MNG580164	WS 001	Precipitation	193	in	10/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/8/2017		0.31	N
MNG580164	WS 001	Precipitation	193	in	10/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/9/2017		0.26	N
MNG580164	WS 001	Precipitation	193	in	10/10/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/10/2017		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/11/2017		0.28	N
MNG580164	WS 001	Precipitation	193	in	10/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/12/2017		0.23	N
MNG580164	WS 001	Precipitation	193	in	10/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/13/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/14/2017		0.41	N
MNG580164	WS 001	Flow	50050	mgd	10/14/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/15/2017		0.22	N
MNG580164	WS 001	Precipitation	193	in	10/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/16/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/17/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	10/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/18/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/19/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/20/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/21/2017		0.59	N
MNG580164	WS 001	Flow	50050	mgd	10/21/2017		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/22/2017		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	10/22/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/23/2017		0.18	N
MNG580164	WS 001	Precipitation	193	in	10/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/24/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	10/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/25/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/26/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	10/26/2017		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/27/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	10/27/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/28/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/29/2017		0.1	N
MNG580164	WS 001	Flow	50050	mgd	10/29/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/30/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	10/31/2017		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/1/2017		10.3	N
MNG580164	SD 003	pH	400	SU	11/1/2017		8.17	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/1/2017		3	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	11/1/2017		6.47	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	11/1/2017		5.22	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	11/1/2017		1.25	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/1/2017		1.69	N
MNG580164	SD 003	Flow	50050	mgd	11/1/2017		1.32	N
MNG580164	SD 003	Solids, Total Dissolved (TDS)	70295	mg/L	11/1/2017		860	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/1/2017		1.2	N
MNG580164	WS 001	Precipitation	193	in	11/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/1/2017		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/2/2017		6.51	N
MNG580164	SD 003	pH	400	SU	11/2/2017		7.93	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/2/2017		2	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/2/2017		1.71	N
MNG580164	SD 003	Flow	50050	mgd	11/2/2017		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/2/2017		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/2/2017		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/3/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/3/2017		0.1	N
MNG580164	WS 001	Flow	50050	mgd	11/3/2017		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/4/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/4/2017		0.18	N
MNG580164	WS 001	Flow	50050	mgd	11/4/2017		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/5/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/5/2017		0.18	N
MNG580164	SD 003	Flow	50050	mgd	11/6/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/6/2017		0.12	N
MNG580164	SD 003	Flow	50050	mgd	11/7/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/7/2017		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/8/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/8/2017		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/9/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	11/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/9/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/10/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	11/10/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/11/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/12/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/13/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/13/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/14/2017		0.11	N
MNG580164	WS 001	Flow	50050	mgd	11/14/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/15/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/16/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	11/17/2017		0.01	N
MNG580164	WS 001	Flow	50050	mgd	11/17/2017		0.17	N
MNG580164	WS 001	Precipitation	193	in	11/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/18/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/19/2017		0.20	N
MNG580164	WS 001	Precipitation	193	in	11/20/2017		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reportad Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	11/20/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/21/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/22/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/23/2017		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/24/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/25/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/26/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/27/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/28/2017		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/29/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	11/30/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	12/1/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/1/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/2/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/2/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	12/3/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/3/2017		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/4/2017		0.26	N
MNG580164	WS 001	Flow	50050	mgd	12/4/2017		0.11	N
MNG580164	WS 001	Precipitation	193	in	12/5/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/5/2017		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/6/2017		17.1	N
MNG580164	SD 003	pH	400	SU	12/6/2017		8.57	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/6/2017		22	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/6/2017		1.41	N
MNG580164	SD 003	Flow	50050	mgd	12/6/2017		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/6/2017		15	N
MNG580164	WS 001	Precipitation	193	in	12/6/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/6/2017		0.11	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/7/2017		16.2	N
MNG580164	SD 003	pH	400	SU	12/7/2017		8.39	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/7/2017		20	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/7/2017		1.42	N
MNG580164	SD 003	Flow	50050	mgd	12/7/2017		1.32	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/7/2017		10	N
MNG580164	WS 001	Precipitation	193	in	12/7/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/7/2017		0.10	N
MNG580164	SD 003	Flow	50050	mgd	12/8/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/8/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/8/2017		0.09	N
MNG580164	SD 003	Flow	50050	mgd	12/9/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/9/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/9/2017		0.11	N
MNG580164	SD 003	Flow	50050	mgd	12/10/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/10/2017		0.06	N
MNG580164	WS 001	Flow	50050	mgd	12/10/2017		0.11	N
MNG580164	SD 003	Flow	50050	mgd	12/11/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/11/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/11/2017		0.13	N
MNG580164	SD 003	Flow	50050	mgd	12/12/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/12/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/12/2017		0.09	N
MNG580164	SD 003	Flow	50050	mgd	12/13/2017		1.32	N
MNG580164	WS 001	Precipitation	193	in	12/13/2017		0.02	N
MNG580164	WS 001	Flow	50050	mgd	12/13/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/14/2017		0	N
MNG580164	WS 001	pH	400	SU	12/14/2017		8.06	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	12/14/2017		86	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	12/14/2017		4.64	N
MNG580164	WS 001	Flow	50050	mgd	12/14/2017		0.08	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/14/2017		116	N
MNG580164	WS 001	Precipitation	193	in	12/15/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/15/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/16/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/16/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/17/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/17/2017		0.13	N
MNG580164	WS 001	Precipitation	193	in	12/18/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/18/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/19/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/19/2017		0.09	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	12/20/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/20/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/21/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/21/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/22/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/22/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/23/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/23/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/24/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/24/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/25/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/25/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/26/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/26/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/27/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/27/2017		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/28/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/28/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/29/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/29/2017		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/30/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/30/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/31/2017		0	N
MNG580164	WS 001	Flow	50050	mgd	12/31/2017		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/1/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/1/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/2/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/3/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/4/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/5/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/6/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/7/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/8/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/9/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/10/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/11/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/12/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	1/12/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/13/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/14/2018		0.09	N
MNG580164	WS 001	Flow	50050	mgd	1/14/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/15/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/16/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/17/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/18/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/19/2018		0.06	N
MNG580164	WS 001	Precipitation	193	in	1/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/20/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/21/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	1/22/2018		0.21	N
MNG580164	WS 001	Flow	50050	mgd	1/22/2018		0.06	N
MNG580164	WS 001	Precipitation	193	in	1/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/23/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/24/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/25/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/26/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/27/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/28/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/29/2018		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	1/29/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	1/30/2018		0.04	N
MNG580164	WS 001	Flow	50050	mgd	1/30/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/31/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	1/31/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/1/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/1/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/2/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/3/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/4/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	2/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/5/2018		0.05	N
MNG580164	WS 001	Precipitation	193	in	2/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/6/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/7/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/8/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/9/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/10/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/11/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/12/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/13/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	2/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/14/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	2/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/15/2018		0.05	N
MNG580164	WS 001	Precipitation	193	in	2/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/16/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/17/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	2/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/18/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/19/2018		0.02	N
MNG580164	WS 001	Flow	50050	mgd	2/19/2018		0.04	N
MNG580164	WS 001	Precipitation	193	in	2/20/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	2/20/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/21/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/22/2018		0.24	N
MNG580164	WS 001	Flow	50050	mgd	2/22/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	2/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/23/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/24/2018		0.58	N
MNG580164	WS 001	Flow	50050	mgd	2/24/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/25/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	2/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/26/2018		0.06	N
MNG580164	WS 001	Precipitation	193	in	2/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/27/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	2/28/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/1/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/1/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/2/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/3/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	3/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/4/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/5/2018		0.56	N
MNG580164	WS 001	Flow	50050	mgd	3/5/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	3/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/6/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	3/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/7/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/8/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/9/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/10/2018		0.07	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	3/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/11/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	3/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/12/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/13/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/14/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/15/2018		0	N
MNG580164	WS 001	pH	400	SU	3/15/2018		8.1	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	3/15/2018		138	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	3/15/2018		5.51	N
MNG580164	WS 001	Flow	50050	mgd	3/15/2018		0.09	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	3/15/2018		98	N
MNG580164	WS 001	Precipitation	193	in	3/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/16/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	3/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/17/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/18/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/19/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/20/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/21/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	3/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/22/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/23/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	3/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/24/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/25/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	3/26/2018		0.57	N
MNG580164	WS 001	Flow	50050	mgd	3/26/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/27/2018		0.21	N
MNG580164	WS 001	Precipitation	193	in	3/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/28/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	3/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/29/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	3/30/2018		0.23	N
MNG580164	WS 001	Flow	50050	mgd	3/30/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/31/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	3/31/2018		0.24	N
MNG580164	WS 001	Precipitation	193	in	4/1/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/1/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	4/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/2/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	4/3/2018		0.45	N
MNG580164	WS 001	Flow	50050	mgd	4/3/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	4/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/4/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	4/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/5/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/6/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	4/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/7/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	4/8/2018		0.12	N
MNG580164	WS 001	Flow	50050	mgd	4/8/2018		0.18	N
MNG580164	WS 001	Precipitation	193	in	4/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/9/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	4/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/10/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	4/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/11/2018		0.22	N
MNG580164	WS 001	Precipitation	193	in	4/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/12/2018		0.18	N
MNG580164	WS 001	Precipitation	193	in	4/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/13/2018		0.21	N
MNG580164	WS 001	Precipitation	193	in	4/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/14/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/15/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	4/16/2018		0.39	N
MNG580164	WS 001	Flow	50050	mgd	4/16/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	4/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/17/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	4/18/2018		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	4/18/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	4/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/19/2018		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/20/2018		0.31	N
MNG580164	WS 001	Precipitation	193	in	4/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/21/2018		0.40	N
MNG580164	WS 001	Precipitation	193	in	4/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/22/2018		0.55	N
MNG580164	WS 001	Precipitation	193	in	4/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/23/2018		0.32	N
MNG580164	WS 001	Precipitation	193	in	4/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/24/2018		0.36	N
MNG580164	WS 001	Precipitation	193	in	4/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/25/2018		0.34	N
MNG580164	WS 001	Precipitation	193	in	4/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/26/2018		0.32	N
MNG580164	WS 001	Precipitation	193	in	4/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/27/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/28/2018		0.24	N
MNG580164	WS 001	Precipitation	193	in	4/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	4/29/2018		0.28	N
MNG580164	WS 001	Precipitation	193	in	4/30/2018		0.23	N
MNG580164	WS 001	Flow	50050	mgd	4/30/2018		0.27	N
MNG580164	WS 001	Precipitation	193	in	5/1/2018		0.05	N
MNG580164	WS 001	Flow	50050	mgd	5/1/2018		0.22	N
MNG580164	WS 001	Precipitation	193	in	5/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/2/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	5/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/3/2018		0.22	N
MNG580164	WS 001	Precipitation	193	in	5/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/4/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	5/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/5/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	5/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/6/2018		0.26	N
MNG580164	WS 001	Precipitation	193	in	5/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/7/2018		0.19	N
MNG580164	WS 001	Precipitation	193	in	5/8/2018		0.13	N
MNG580164	WS 001	Flow	50050	mgd	5/8/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	5/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/9/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	5/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/10/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	5/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/11/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	5/12/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	5/12/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	5/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/13/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	5/14/2018		0.12	N
MNG580164	WS 001	Flow	50050	mgd	5/14/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	5/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/15/2018		0.16	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/16/2018		10.7	N
MNG580164	SD 003	pH	400	SU	5/16/2018		8.8	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	5/16/2018		14	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	5/16/2018		856	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	5/16/2018		0.33	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/16/2018		2.78	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/16/2018		9	N
MNG580164	SD 003	Flow	50050	mgd	5/16/2018		1.085	N
MNG580164	SD 003	Solids, Total Dissolved (TDS)	70295	mg/L	5/16/2018		5	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/16/2018		4.2	N
MNG580164	WS 001	Precipitation	193	in	5/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/16/2018		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/17/2018		9.3	N
MNG580164	SD 003	pH	400	SU	5/17/2018		8.7	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/17/2018		6	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/17/2018		2.87	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/17/2018		2	N
MNG580164	SD 003	Flow	50050	mgd	5/17/2018		1.8	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/17/2018		5.1	N
MNG580164	WS 001	Precipitation	193	in	5/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/17/2018		0.16	N
MNG580164	SD 003	Flow	50050	mgd	5/18/2018		0.289	N
MNG580164	WS 001	Precipitation	193	in	5/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/18/2018		0.14	N
MNG580164	SD 003	Flow	50050	mgd	5/19/2018		0.289	N
MNG580164	WS 001	Precipitation	193	in	5/19/2018		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	5/19/2018		0.13	N
MNG580164	SD 003	Flow	50050	mgd	5/20/2018		0.289	N
MNG580164	WS 001	Precipitation	193	in	5/20/2018		0.26	N
MNG580164	WS 001	Flow	50050	mgd	5/20/2018		0.15	N
MNG580164	SD 003	Flow	50050	mgd	5/21/2018		0.651	N
MNG580164	WS 001	Precipitation	193	in	5/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/21/2018		0.16	N
MNG580164	SD 003	Flow	50050	mgd	5/22/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/22/2018		0.14	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/23/2018		0.8	N
MNG580164	SD 003	pH	400	SU	5/23/2018		8.3	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/23/2018		10	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/23/2018		3.26	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/23/2018		261	N
MNG580164	SD 003	Flow	50050	mgd	5/23/2018		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/23/2018		17	N
MNG580164	WS 001	Precipitation	193	in	5/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/23/2018		0.17	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/24/2018		0.7	N
MNG580164	SD 003	pH	400	SU	5/24/2018		8.2	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/24/2018		24	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/24/2018		3.49	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/24/2018		687	N
MNG580164	SD 003	Flow	50050	mgd	5/24/2018		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/24/2018		14	N
MNG580164	WS 001	Precipitation	193	in	5/24/2018		0.41	N
MNG580164	WS 001	Flow	50050	mgd	5/24/2018		0.13	N
MNG580164	SD 003	Flow	50050	mgd	5/25/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/25/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	5/25/2018		0.11	N
MNG580164	SD 003	Flow	50050	mgd	5/26/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/26/2018		0.12	N
MNG580164	SD 003	Flow	50050	mgd	5/27/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/27/2018		0.27	N
MNG580164	SD 003	Flow	50050	mgd	5/28/2018		1.085	N
MNG580164	WS 001	Precipitation	193	in	5/28/2018		0.16	N
MNG580164	WS 001	Flow	50050	mgd	5/28/2018		0.34	N
MNG580164	WS 001	Precipitation	193	in	5/29/2018		1.21	N
MNG580164	WS 001	Flow	50050	mgd	5/29/2018		0.30	N
MNG580164	WS 001	Precipitation	193	in	5/30/2018		0.02	N
MNG580164	WS 001	Flow	50050	mgd	5/30/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	5/31/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	5/31/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	6/1/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	6/1/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/2/2018		0.57	N
MNG580164	WS 001	Flow	50050	mgd	6/2/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/3/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	6/3/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/4/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/4/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/5/2018		0.23	N
MNG580164	WS 001	Flow	50050	mgd	6/5/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/6/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/7/2018		0.06	N
MNG580164	WS 001	Flow	50050	mgd	6/7/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/8/2018		0.31	N
MNG580164	WS 001	Flow	50050	mgd	6/8/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/9/2018		0.68	N
MNG580164	WS 001	Flow	50050	mgd	6/9/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/10/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	6/10/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/11/2018		0.8	N
MNG580164	WS 001	Flow	50050	mgd	6/11/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/12/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/13/2018		0	N
MNG580164	WS 001	pH	400	SU	6/13/2018		7.6	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	6/13/2018		368	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	6/13/2018		3.7	N
MNG580164	WS 001	Flow	50050	mgd	6/13/2018		0.25	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	6/13/2018		152	N
MNG580164	WS 001	Precipitation	193	in	6/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/14/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/15/2018		0.3	N
MNG580164	WS 001	Flow	50050	mgd	6/15/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/16/2018		0.03	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	6/16/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/17/2018		0.99	N
MNG580164	WS 001	Flow	50050	mgd	6/17/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/18/2018		0.15	N
MNG580164	WS 001	Flow	50050	mgd	6/18/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/19/2018		0.21	N
MNG580164	WS 001	Flow	50050	mgd	6/19/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/20/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/21/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/22/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/23/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/24/2018		1.15	N
MNG580164	WS 001	Flow	50050	mgd	6/24/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/25/2018		0.15	N
MNG580164	WS 001	Flow	50050	mgd	6/25/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/26/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/27/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/28/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	6/29/2018		0.25	N
MNG580164	WS 001	Precipitation	193	in	6/30/2018		0.39	N
MNG580164	WS 001	Flow	50050	mgd	6/30/2018		0.22	N
MNG580164	WS 001	Precipitation	193	in	7/1/2018		0.37	N
MNG580164	WS 001	Flow	50050	mgd	7/1/2018		0.32	N
MNG580164	WS 001	Precipitation	193	in	7/2/2018		0.07	N
MNG580164	WS 001	Flow	50050	mgd	7/2/2018		0.24	N
MNG580164	WS 001	Precipitation	193	in	7/3/2018		0.36	N
MNG580164	WS 001	Flow	50050	mgd	7/3/2018		0.26	N
MNG580164	WS 001	Precipitation	193	in	7/4/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	7/4/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	7/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/5/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	7/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/6/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	7/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/7/2018		0.19	N
MNG580164	WS 001	Precipitation	193	in	7/8/2018		0.14	N
MNG580164	WS 001	Flow	50050	mgd	7/8/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/9/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/10/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/11/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/12/2018		0.71	N
MNG580164	WS 001	Flow	50050	mgd	7/12/2018		0.20	N
MNG580164	WS 001	Precipitation	193	in	7/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/13/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/14/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/15/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/16/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/17/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/18/2018		0.45	N
MNG580164	WS 001	Flow	50050	mgd	7/18/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/19/2018		0.68	N
MNG580164	WS 001	Flow	50050	mgd	7/19/2018		0.19	N
MNG580164	WS 001	Precipitation	193	in	7/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/20/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/21/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/22/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/23/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/24/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/25/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	7/25/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/26/2018		0.12	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Ver. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	7/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/27/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/28/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/29/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/30/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	7/30/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/31/2018		0.11	N
MNG580164	WS 001	Flow	50050	mgd	7/31/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/1/2018		0.04	N
MNG580164	WS 001	Flow	50050	mgd	8/1/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/2/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/3/2018		0.8	N
MNG580164	WS 001	Flow	50050	mgd	8/3/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/4/2018		0.07	N
MNG580164	WS 001	Flow	50050	mgd	8/4/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/5/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/6/2018		0.07	N
MNG580164	WS 001	Flow	50050	mgd	8/6/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/7/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/8/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/9/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/10/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/11/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/12/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/13/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	8/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/14/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/15/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/16/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/17/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/18/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/19/2018		0.42	N
MNG580164	WS 001	Flow	50050	mgd	8/19/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/20/2018		0.2	N
MNG580164	WS 001	Flow	50050	mgd	8/20/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/21/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/22/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/23/2018		0.09	N
MNG580164	WS 001	Flow	50050	mgd	8/23/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	8/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/24/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/25/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/26/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/27/2018		0.75	N
MNG580164	WS 001	Flow	50050	mgd	8/27/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/28/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/29/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/30/2018		0.09	N
MNG580164	WS 001	Flow	50050	mgd	8/30/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/31/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	8/31/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	9/1/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/1/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/2/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	9/3/2018		0.65	N
MNG580164	WS 001	Flow	50050	mgd	9/3/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/4/2018		0.74	N
MNG580164	WS 001	Flow	50050	mgd	9/4/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/5/2018		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	9/5/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/6/2018		0	N
MNG580164	WS 001	pH	400	SU	9/6/2018		7.97	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	9/6/2018		178	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	9/6/2018		6.01	N
MNG580164	WS 001	Flow	50050	mgd	9/6/2018		0.10	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/6/2018		152	N
MNG580164	WS 001	Precipitation	193	in	9/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/7/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/8/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/9/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/10/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/11/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/12/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/13/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	9/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/14/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	9/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/15/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/16/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/17/2018		0.81	N
MNG580164	WS 001	Flow	50050	mgd	9/17/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/18/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	9/18/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/19/2018		0.54	N
MNG580164	WS 001	Flow	50050	mgd	9/19/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/20/2018		1.44	N
MNG580164	WS 001	Flow	50050	mgd	9/20/2018		0.23	N
MNG580164	WS 001	Precipitation	193	in	9/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/21/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	9/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/22/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/23/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	9/24/2018		0.16	N
MNG580164	WS 001	Flow	50050	mgd	9/24/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	9/25/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	9/25/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	9/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/26/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/27/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/28/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/29/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/30/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	9/30/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	10/1/2018		0.1	N
MNG580164	WS 001	Flow	50050	mgd	10/1/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	10/2/2018		0.04	N
MNG580164	WS 001	Flow	50050	mgd	10/2/2018		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	10/3/2018		8.3	N
MNG580164	SD 003	pH	400	SU	10/3/2018		8.8	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	10/3/2018		15	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	10/3/2018		0.12	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	10/3/2018		2.75	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	10/3/2018		0.92	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	10/3/2018		2.27	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	10/3/2018		23	N
MNG580164	SD 003	Flow	50050	mgd	10/3/2018		1.302	N
MNG580164	SD 003	Solids, Total Dissolved (TDS)	70295	mg/L	10/3/2018		879	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	10/3/2018		3.1	N
MNG580164	WS 001	Precipitation	193	in	10/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/3/2018		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	10/4/2018		9.1	N
MNG580164	SD 003	pH	400	SU	10/4/2018		8.8	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	10/4/2018		14	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	10/4/2018		2.27	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	10/4/2018		6	N
MNG580164	SD 003	Flow	50050	mgd	10/4/2018		0.521	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	10/4/2018		7.2	N
MNG580164	WS 001	Precipitation	193	in	10/4/2018		0.37	N
MNG580164	WS 001	Flow	50050	mgd	10/4/2018		0.13	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	SD 003	Flow	50050	mgd	10/5/2018		1.042	N
MNG580164	WS 001	Precipitation	193	in	10/5/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/5/2018		0.08	N
MNG580164	SD 003	Flow	50050	mgd	10/6/2018		0.781	N
MNG580164	WS 001	Precipitation	193	in	10/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/6/2018		0.10	N
MNG580164	SD 003	Flow	50050	mgd	10/7/2018		0.781	N
MNG580164	WS 001	Precipitation	193	in	10/7/2018		0.2	N
MNG580164	WS 001	Flow	50050	mgd	10/7/2018		0.12	N
MNG580164	SD 003	Flow	50050	mgd	10/8/2018		1.302	N
MNG580164	WS 001	Precipitation	193	in	10/8/2018		0.31	N
MNG580164	WS 001	Flow	50050	mgd	10/8/2018		0.13	N
MNG580164	SD 003	Flow	50050	mgd	10/9/2018		1.562	N
MNG580164	WS 001	Precipitation	193	in	10/9/2018		1.31	N
MNG580164	WS 001	Flow	50050	mgd	10/9/2018		0.25	N
MNG580164	SD 003	Flow	50050	mgd	10/10/2018		1.562	N
MNG580164	WS 001	Precipitation	193	in	10/10/2018		0.08	N
MNG580164	WS 001	Flow	50050	mgd	10/10/2018		0.24	N
MNG580164	WS 001	Precipitation	193	in	10/11/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/11/2018		0.18	N
MNG580164	WS 001	Precipitation	193	in	10/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/12/2018		0.19	N
MNG580164	WS 001	Precipitation	193	in	10/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/13/2018		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/14/2018		0.05	N
MNG580164	WS 001	Flow	50050	mgd	10/14/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/15/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/16/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	10/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/17/2018		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/18/2018		0.02	N
MNG580164	WS 001	Flow	50050	mgd	10/18/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/19/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	10/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/20/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/21/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/22/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/23/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/24/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/25/2018		0.12	N
MNG580164	WS 001	Flow	50050	mgd	10/25/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/26/2018		0.12	N
MNG580164	WS 001	Flow	50050	mgd	10/26/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/27/2018		0.12	N
MNG580164	WS 001	Flow	50050	mgd	10/27/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/28/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	10/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/29/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/30/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/30/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	10/31/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	10/31/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/1/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	11/1/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/2/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/3/2018		0.3	N
MNG580164	WS 001	Flow	50050	mgd	11/3/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/4/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	11/4/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/5/2018		0.41	N
MNG580164	WS 001	Flow	50050	mgd	11/5/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/6/2018		0.02	N
MNG580164	WS 001	Flow	50050	mgd	11/6/2018		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/7/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/8/2018		0.06	N
MNG580164	WS 001	Flow	50050	mgd	11/8/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/9/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/10/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	11/10/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/11/2018		0.01	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	11/11/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/12/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/13/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/14/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	11/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/15/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/16/2018		0.05	N
MNG580164	WS 001	Flow	50050	mgd	11/16/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/17/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/18/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/19/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/20/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/21/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/22/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/22/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/23/2018		0.34	N
MNG580164	WS 001	Flow	50050	mgd	11/23/2018		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/24/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/25/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/26/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/26/2018		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/27/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/27/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/28/2018		0.15	N
MNG580164	WS 001	Flow	50050	mgd	11/28/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/29/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	11/30/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	11/30/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/1/2018		0.08	N
MNG580164	WS 001	Flow	50050	mgd	12/1/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/2/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/2/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/3/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/3/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/4/2018		0.06	N
MNG580164	WS 001	Flow	50050	mgd	12/4/2018		0.09	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/5/2018		8.9	N
MNG580164	SD 003	pH	400	SU	12/5/2018		8.58	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/5/2018		23	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/5/2018		2.33	N
MNG580164	SD 003	Flow	50050	mgd	12/5/2018		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/5/2018		6.3	N
MNG580164	WS 001	Precipitation	193	in	12/5/2018		0	N
MNG580164	WS 001	pH	400	SU	12/5/2018		8.09	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	12/5/2018		168	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	12/5/2018		4.45	N
MNG580164	WS 001	Flow	50050	mgd	12/5/2018		0.09	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/5/2018		127	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	12/6/2018		14.1	N
MNG580164	SD 003	pH	400	SU	12/6/2018		9.09	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	12/6/2018		23	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	12/6/2018		2.04	N
MNG580164	SD 003	Flow	50050	mgd	12/6/2018		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	12/6/2018		12	N
MNG580164	WS 001	Precipitation	193	in	12/6/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/6/2018		0.10	N
MNG580164	SD 003	Flow	50050	mgd	12/7/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	12/7/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/7/2018		0.07	N
MNG580164	SD 003	Flow	50050	mgd	12/8/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	12/8/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/8/2018		0.08	N
MNG580164	SD 003	Flow	50050	mgd	12/9/2018		1.04	N
MNG580164	WS 001	Precipitation	193	in	12/9/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/9/2018		0.10	N
MNG580164	SD 003	Flow	50050	mgd	12/10/2018		1.3	N
MNG580164	WS 001	Precipitation	193	in	12/10/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/10/2018		0.09	N
MNG580164	SD 003	Flow	50050	mgd	12/11/2018		1.04	N
MNG580164	WS 001	Precipitation	193	in	12/11/2018		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	12/11/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/12/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/12/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/13/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/13/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	12/14/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/14/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/15/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/15/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/16/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/16/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/17/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/17/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/18/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/18/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/19/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/19/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/20/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/20/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	12/21/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/21/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/22/2018		0.01	N
MNG580164	WS 001	Flow	50050	mgd	12/22/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/23/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/23/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	12/24/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/24/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/25/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/25/2018		0.07	N
MNG580164	WS 001	Precipitation	193	in	12/26/2018		0.73	N
MNG580164	WS 001	Flow	50050	mgd	12/26/2018		0.09	N
MNG580164	WS 001	Precipitation	193	in	12/27/2018		0.52	N
MNG580164	WS 001	Flow	50050	mgd	12/27/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	12/28/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/28/2018		0.14	N
MNG580164	WS 001	Precipitation	193	in	12/29/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/29/2018		0.10	N
MNG580164	WS 001	Precipitation	193	in	12/30/2018		0	N
MNG580164	WS 001	Flow	50050	mgd	12/30/2018		0.12	N
MNG580164	WS 001	Precipitation	193	in	12/31/2018		0.03	N
MNG580164	WS 001	Flow	50050	mgd	12/31/2018		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/1/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/2/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/3/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/4/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/5/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/6/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/7/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/8/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/9/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/9/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/10/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/10/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/11/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/11/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/12/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/13/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/14/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/15/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/16/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/17/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/17/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/18/2019		0.1	N
MNG580164	WS 001	Flow	50050	mgd	1/18/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/19/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/20/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/20/2019		0.10	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'I', 'S')
MNG580164	WS 001	Precipitation	193	in	1/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/21/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/22/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	1/22/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/23/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/24/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	1/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/25/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/26/2019		0.06	N
MNG580164	WS 001	Precipitation	193	in	1/27/2019		0.39	N
MNG580164	WS 001	Flow	50050	mgd	1/27/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	1/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/28/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	1/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/29/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	1/30/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	1/31/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	1/31/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/1/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/2/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/3/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	2/3/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/4/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/5/2019		0.23	N
MNG580164	WS 001	Flow	50050	mgd	2/5/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/6/2019		0.13	N
MNG580164	WS 001	Flow	50050	mgd	2/6/2019		0.06	N
MNG580164	WS 001	Precipitation	193	in	2/7/2019		0.16	N
MNG580164	WS 001	Flow	50050	mgd	2/7/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/8/2019		0.15	N
MNG580164	WS 001	Flow	50050	mgd	2/8/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/9/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/9/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/10/2019		0.17	N
MNG580164	WS 001	Flow	50050	mgd	2/10/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/11/2019		0.29	N
MNG580164	WS 001	Flow	50050	mgd	2/11/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/12/2019		0.02	N
MNG580164	WS 001	Flow	50050	mgd	2/12/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/13/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/14/2019		0.06	N
MNG580164	WS 001	Flow	50050	mgd	2/14/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/15/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/16/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/17/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	2/17/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/18/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/19/2019		0.28	N
MNG580164	WS 001	Flow	50050	mgd	2/19/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/20/2019		0.27	N
MNG580164	WS 001	Flow	50050	mgd	2/20/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	2/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/21/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	2/22/2019		0.2	N
MNG580164	WS 001	Flow	50050	mgd	2/22/2019		0.06	N
MNG580164	WS 001	Precipitation	193	in	2/23/2019		0.16	N
MNG580164	WS 001	Flow	50050	mgd	2/23/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/24/2019		0.14	N
MNG580164	WS 001	Flow	50050	mgd	2/24/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/25/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/26/2019		0.07	N
MNG580164	WS 001	Flow	50050	mgd	2/26/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	2/27/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/27/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	2/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	2/28/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/1/2019		0.14	N
MNG580164	WS 001	Flow	50050	mgd	3/1/2019		0.06	N
MNG580164	WS 001	Precipitation	193	in	3/2/2019		0	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	3/2/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/3/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	3/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/4/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/5/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/6/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/7/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/8/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/9/2019		0.85	N
MNG580164	WS 001	Flow	50050	mgd	3/9/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	3/10/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/10/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/11/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/11/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	3/12/2019		0.04	N
MNG580164	WS 001	Flow	50050	mgd	3/12/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	3/13/2019		1.14	N
MNG580164	WS 001	Flow	50050	mgd	3/13/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	3/14/2019		1.2	N
MNG580164	WS 001	Flow	50050	mgd	3/14/2019		0.25	N
MNG580164	WS 001	Precipitation	193	in	3/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/15/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	3/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/16/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/17/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/17/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	3/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/18/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	3/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/19/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	3/20/2019		0	N
MNG580164	WS 001	pH	400	SU	3/20/2019		8.11	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	3/20/2019		102	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	3/20/2019		3.89	N
MNG580164	WS 001	Flow	50050	mgd	3/20/2019		0.23	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	3/20/2019		94	N
MNG580164	WS 001	Precipitation	193	in	3/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/21/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	3/22/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/22/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	3/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/23/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	3/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/24/2019		0.30	N
MNG580164	WS 001	Precipitation	193	in	3/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/25/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	3/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/26/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	3/27/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/27/2019		0.34	N
MNG580164	WS 001	Precipitation	193	in	3/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/28/2019		0.32	N
MNG580164	WS 001	Precipitation	193	in	3/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/29/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	3/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/30/2019		0.21	N
MNG580164	WS 001	Precipitation	193	in	3/31/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	3/31/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	4/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/1/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	4/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/2/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	4/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/3/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	4/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/4/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	4/5/2019		1.2	N
MNG580164	WS 001	Flow	50050	mgd	4/5/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/6/2019		0.5	N
MNG580164	WS 001	Flow	50050	mgd	4/6/2019		0.42	N
MNG580164	WS 001	Precipitation	193	in	4/7/2019		0.08	N
MNG580164	WS 001	Flow	50050	mgd	4/7/2019		0.29	N
MNG580164	WS 001	Precipitation	193	in	4/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/8/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	4/9/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/9/2019		0.21	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	4/10/2019		0.67	N
MNG580164	WS 001	Flow	50050	mgd	4/10/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/11/2019		0.35	N
MNG580164	WS 001	Flow	50050	mgd	4/11/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	4/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/12/2019		0.30	N
MNG580164	WS 001	Precipitation	193	in	4/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/13/2019		0.45	N
MNG580164	WS 001	Precipitation	193	in	4/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/14/2019		0.42	N
MNG580164	WS 001	Precipitation	193	in	4/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/15/2019		0.51	N
MNG580164	WS 001	Precipitation	193	in	4/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/16/2019		0.34	N
MNG580164	WS 001	Precipitation	193	in	4/17/2019		0.85	N
MNG580164	WS 001	Flow	50050	mgd	4/17/2019		0.86	N
MNG580164	WS 001	Precipitation	193	in	4/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/18/2019		0.54	N
MNG580164	WS 001	Precipitation	193	in	4/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/19/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	4/20/2019		0.1	N
MNG580164	WS 001	Flow	50050	mgd	4/20/2019		0.40	N
MNG580164	WS 001	Precipitation	193	in	4/21/2019		0.67	N
MNG580164	WS 001	Flow	50050	mgd	4/21/2019		0.34	N
MNG580164	WS 001	Precipitation	193	in	4/22/2019		0.17	N
MNG580164	WS 001	Flow	50050	mgd	4/22/2019		0.37	N
MNG580164	WS 001	Precipitation	193	in	4/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/23/2019		0.35	N
MNG580164	WS 001	Precipitation	193	in	4/24/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	4/24/2019		0.31	N
MNG580164	WS 001	Precipitation	193	in	4/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/25/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	4/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/26/2019		0.31	N
MNG580164	WS 001	Precipitation	193	in	4/27/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/27/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	4/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/28/2019		0.23	N
MNG580164	WS 001	Precipitation	193	in	4/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	4/29/2019		0.23	N
MNG580164	WS 001	Precipitation	193	in	4/30/2019		0.4	N
MNG580164	WS 001	Flow	50050	mgd	4/30/2019		0.31	N
MNG580164	WS 001	Precipitation	193	in	5/1/2019		0.04	N
MNG580164	WS 001	Flow	50050	mgd	5/1/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	5/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/2/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	5/3/2019		0.23	N
MNG580164	WS 001	Flow	50050	mgd	5/3/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	5/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/4/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	5/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/5/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	5/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/6/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	5/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/7/2019		0.10	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/8/2019		12.4	N
MNG580164	SD 003	pH	400	SU	5/8/2019		8.87	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/8/2019		11	N
MNG580164	SD 003	Nitrogen, Ammonia, Total (as N)	610	mg/L	5/8/2019		3.69	N
MNG580164	SD 003	Nitrogen, Kjeldahl, Total	625	mg/L	5/8/2019		6.69	N
MNG580164	SD 003	Nitrite Plus Nitrate, Total (as N)	630	mg/L	5/8/2019		1.17	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/8/2019		1.57	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/8/2019		1	N
MNG580164	SD 003	Flow	50050	mgd	5/8/2019		1.3	N
MNG580164	SD 003	Solids, Total Dissolved (TDS)	70295	mg/L	5/8/2019		656	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/8/2019		12	N
MNG580164	WS 001	Precipitation	193	in	5/8/2019		1.17	N
MNG580164	WS 001	Flow	50050	mgd	5/8/2019		0.17	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	5/9/2019		11.9	N
MNG580164	SD 003	pH	400	SU	5/9/2019		8.74	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	5/9/2019		10	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	5/9/2019		1.56	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	5/9/2019		1	N
MNG580164	SD 003	Flow	50050	mgd	5/9/2019		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	5/9/2019		14	N
MNG580164	WS 001	Precipitation	193	in	5/9/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	5/9/2019		0.15	N
MNG580164	SD 003	Flow	50050	mgd	5/10/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/10/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/10/2019		0.15	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	SD 003	Flow	50050	mgd	5/11/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/11/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/11/2019		0.13	N
MNG580164	SD 003	Flow	50050	mgd	5/12/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/12/2019		0.12	N
MNG580164	SD 003	Flow	50050	mgd	5/13/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/13/2019		0.11	N
MNG580164	SD 003	Flow	50050	mgd	5/14/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/14/2019		0.06	N
MNG580164	WS 001	Flow	50050	mgd	5/14/2019		0.10	N
MNG580164	SD 003	Flow	50050	mgd	5/15/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/15/2019		0.13	N
MNG580164	WS 001	Flow	50050	mgd	5/15/2019		0.11	N
MNG580164	SD 003	Flow	50050	mgd	5/16/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	5/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/16/2019		0.11	N
MNG580164	SD 003	Flow	50050	mgd	5/17/2019		0.52	N
MNG580164	WS 001	Precipitation	193	in	5/17/2019		0.78	N
MNG580164	WS 001	Flow	50050	mgd	5/17/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	5/18/2019		0.52	N
MNG580164	WS 001	Flow	50050	mgd	5/18/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	5/19/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	5/19/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	5/20/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/20/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	5/21/2019		1.11	N
MNG580164	WS 001	Flow	50050	mgd	5/21/2019		0.21	N
MNG580164	WS 001	Precipitation	193	in	5/22/2019		0.15	N
MNG580164	WS 001	Flow	50050	mgd	5/22/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	5/23/2019		0.11	N
MNG580164	WS 001	Flow	50050	mgd	5/23/2019		0.44	N
MNG580164	WS 001	Precipitation	193	in	5/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/24/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	5/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/25/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	5/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/26/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	5/27/2019		1.35	N
MNG580164	WS 001	Flow	50050	mgd	5/27/2019		0.73	N
MNG580164	WS 001	Precipitation	193	in	5/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/28/2019		0.44	N
MNG580164	WS 001	Precipitation	193	in	5/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/29/2019		0.33	N
MNG580164	WS 001	Precipitation	193	in	5/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	5/30/2019		0.90	N
MNG580164	WS 001	Precipitation	193	in	5/31/2019		0.04	N
MNG580164	WS 001	Flow	50050	mgd	5/31/2019		0.27	N
MNG580164	WS 001	Precipitation	193	in	6/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/1/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	6/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/2/2019		0.23	N
MNG580164	WS 001	Precipitation	193	in	6/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/3/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	6/4/2019		1.26	N
MNG580164	WS 001	Flow	50050	mgd	6/4/2019		0.38	N
MNG580164	WS 001	Precipitation	193	in	6/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/5/2019		0.27	N
MNG580164	WS 001	Precipitation	193	in	6/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/6/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	6/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/7/2019		0.21	N
MNG580164	WS 001	Precipitation	193	in	6/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/8/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	6/9/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/9/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	6/10/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/10/2019		0.18	N
MNG580164	WS 001	Precipitation	193	in	6/11/2019		0.11	N
MNG580164	WS 001	Flow	50050	mgd	6/11/2019		0.18	N
MNG580164	WS 001	Precipitation	193	in	6/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/12/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	6/13/2019		0	N
MNG580164	WS 001	pH	400	SU	6/13/2019		7.85	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	6/13/2019		90	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	6/13/2019		2.85	N
MNG580164	WS 001	Flow	50050	mgd	6/13/2019		0.13	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	6/13/2019		85	N
MNG580164	WS 001	Precipitation	193	in	6/14/2019		0.08	N
MNG580164	WS 001	Flow	50050	mgd	6/14/2019		0.18	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	6/15/2019		0.09	N
MNG580164	WS 001	Flow	50050	mgd	6/15/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	6/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/16/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/17/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/17/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	6/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/18/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	6/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/19/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/20/2019		0.57	N
MNG580164	WS 001	Flow	50050	mgd	6/20/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	6/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/21/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	6/22/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	6/22/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/23/2019		0.65	N
MNG580164	WS 001	Flow	50050	mgd	6/23/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	6/24/2019		0.11	N
MNG580164	WS 001	Flow	50050	mgd	6/24/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	6/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/25/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	6/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/26/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/27/2019		0.54	N
MNG580164	WS 001	Flow	50050	mgd	6/27/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	6/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/28/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	6/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	6/29/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	6/30/2019		1.65	N
MNG580164	WS 001	Flow	50050	mgd	6/30/2019		0.21	N
MNG580164	WS 001	Precipitation	193	in	7/1/2019		0.66	N
MNG580164	WS 001	Flow	50050	mgd	7/1/2019		0.35	N
MNG580164	WS 001	Precipitation	193	in	7/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/2/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	7/3/2019		1.04	N
MNG580164	WS 001	Flow	50050	mgd	7/3/2019		0.37	N
MNG580164	WS 001	Precipitation	193	in	7/4/2019		0.75	N
MNG580164	WS 001	Flow	50050	mgd	7/4/2019		0.68	N
MNG580164	WS 001	Precipitation	193	in	7/5/2019		0.22	N
MNG580164	WS 001	Flow	50050	mgd	7/5/2019		0.36	N
MNG580164	WS 001	Precipitation	193	in	7/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/6/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	7/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/7/2019		0.30	N
MNG580164	WS 001	Precipitation	193	in	7/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/8/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	7/9/2019		0.24	N
MNG580164	WS 001	Flow	50050	mgd	7/9/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	7/10/2019		0.06	N
MNG580164	WS 001	Flow	50050	mgd	7/10/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	7/11/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/11/2019		0.19	N
MNG580164	WS 001	Precipitation	193	in	7/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/12/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	7/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/13/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/14/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/15/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	7/15/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/16/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/17/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	7/17/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/18/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/19/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/20/2019		0.87	N
MNG580164	WS 001	Flow	50050	mgd	7/20/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	7/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/21/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	7/22/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/22/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	7/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/23/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	7/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/24/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/25/2019		0.2	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50050	mgd	7/25/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/26/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	7/27/2019		0.05	N
MNG580164	WS 001	Flow	50050	mgd	7/27/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	7/28/2019		1.23	N
MNG580164	WS 001	Flow	50050	mgd	7/28/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	7/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/29/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/30/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	7/31/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	7/31/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/1/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/2/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/3/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/4/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/5/2019		0.46	N
MNG580164	WS 001	Flow	50050	mgd	8/5/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/6/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/7/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	8/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/8/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/9/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	8/9/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/10/2019		0.1	N
MNG580164	WS 001	Flow	50050	mgd	8/10/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/11/2019		0.02	N
MNG580164	WS 001	Flow	50050	mgd	8/11/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/12/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/13/2019		0.22	N
MNG580164	WS 001	Flow	50050	mgd	8/13/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/14/2019		0.08	N
MNG580164	WS 001	Precipitation	193	in	8/15/2019		0.33	N
MNG580164	WS 001	Flow	50050	mgd	8/15/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	8/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/16/2019		0.07	N
MNG580164	WS 001	Precipitation	193	in	8/17/2019		1.54	N
MNG580164	WS 001	Flow	50050	mgd	8/17/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	8/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/18/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/19/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	8/20/2019		0.77	N
MNG580164	WS 001	Flow	50050	mgd	8/20/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	8/21/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/21/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/22/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/22/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	8/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/23/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/24/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/25/2019		0.02	N
MNG580164	WS 001	Flow	50050	mgd	8/25/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	8/26/2019		1.14	N
MNG580164	WS 001	Flow	50050	mgd	8/26/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	8/27/2019		0.04	N
MNG580164	WS 001	Flow	50050	mgd	8/27/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/28/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/29/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	8/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	8/30/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	8/31/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	8/31/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	9/1/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/1/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	9/2/2019		0.84	N
MNG580164	WS 001	Flow	50050	mgd	9/2/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	9/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/3/2019		0.12	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Precipitation	193	in	9/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/4/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/5/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	9/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/6/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/7/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/8/2019		0.36	N
MNG580164	WS 001	Flow	50050	mgd	9/8/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/9/2019		0.29	N
MNG580164	WS 001	Flow	50050	mgd	9/9/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/10/2019		0.94	N
MNG580164	WS 001	Flow	50050	mgd	9/10/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/11/2019		1.24	N
MNG580164	WS 001	Flow	50050	mgd	9/11/2019		0.31	N
MNG580164	WS 001	Precipitation	193	in	9/12/2019		0.24	N
MNG580164	WS 001	Flow	50050	mgd	9/12/2019		0.44	N
MNG580164	WS 001	Precipitation	193	in	9/13/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/13/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	9/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/14/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	9/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/15/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	9/16/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	9/16/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	9/17/2019		0.42	N
MNG580164	WS 001	Flow	50050	mgd	9/17/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	9/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/18/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	9/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/19/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/20/2019		0.07	N
MNG580164	WS 001	Flow	50050	mgd	9/20/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	9/21/2019		0.08	N
MNG580164	WS 001	Flow	50050	mgd	9/21/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/22/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	9/22/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	9/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/23/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	9/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/24/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	9/25/2019		0	N
MNG580164	WS 001	pH	400	SU	9/25/2019		7.85	N
MNG580164	WS 001	Solids, Total Suspended (TSS)	530	mg/L	9/25/2019		233	N
MNG580164	WS 001	Phosphorus, Total (as P)	665	mg/L	9/25/2019		4.53	N
MNG580164	WS 001	Flow	50050	mgd	9/25/2019		0.12	N
MNG580164	WS 001	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	9/25/2019		109	N
MNG580164	WS 001	Precipitation	193	in	9/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	9/26/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	9/27/2019		0.02	N
MNG580164	WS 001	Flow	50050	mgd	9/27/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	9/28/2019		0.59	N
MNG580164	WS 001	Flow	50050	mgd	9/28/2019		0.12	N
MNG580164	WS 001	Precipitation	193	in	9/29/2019		1.46	N
MNG580164	WS 001	Flow	50050	mgd	9/29/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	9/30/2019		0.28	N
MNG580164	WS 001	Flow	50050	mgd	9/30/2019		0.31	N
MNG580164	SD 003	Flow	50050	mgd	10/1/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/1/2019		1.05	N
MNG580164	WS 001	Flow	50050	mgd	10/1/2019		0.58	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	10/2/2019		2.2	N
MNG580164	SD 003	pH	400	SU	10/2/2019		8.4	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	10/2/2019		2	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	10/2/2019		1.48	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	10/2/2019		13	N
MNG580164	SD 003	Flow	50050	mgd	10/2/2019		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	10/2/2019		1	N
MNG580164	WS 001	Precipitation	193	in	10/2/2019		0.43	N
MNG580164	WS 001	Flow	50050	mgd	10/2/2019		0.42	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	10/3/2019		3.2	N
MNG580164	SD 003	pH	400	SU	10/3/2019		8.37	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	10/3/2019		11	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	10/3/2019		1.48	N
MNG580164	SD 003	Fecal Coliform, MPN or Membrane Filter 44.5C	48201	#/100ml	10/3/2019		2	N
MNG580164	SD 003	Flow	50050	mgd	10/3/2019		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	10/3/2019		2.3	N
MNG580164	WS 001	Precipitation	193	in	10/3/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	10/3/2019		0.41	N
MNG580164	SD 003	Flow	50050	mgd	10/4/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/4/2019		1	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ('<' or '>')	Reported Value	Var. of Op. ('N', 'T', 'S')
MNG580164	WS 001	Flow	50080	mgd	10/4/2019		0.37	N
MNG580164	SD 003	Flow	50050	mgd	10/5/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/5/2019		0.1	N
MNG580164	WS 001	Flow	50050	mgd	10/5/2019		0.52	N
MNG580164	SD 003	Flow	50050	mgd	10/6/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/6/2019		0.39	N
MNG580164	SD 003	Flow	50050	mgd	10/7/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/7/2019		0.31	N
MNG580164	SD 003	Flow	50050	mgd	10/8/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	10/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/8/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	10/9/2019		0.09	N
MNG580164	WS 001	Flow	50050	mgd	10/9/2019		0.27	N
MNG580164	WS 001	Precipitation	193	in	10/10/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/10/2019		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/11/2019		0.04	N
MNG580164	WS 001	Flow	50050	mgd	10/11/2019		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/12/2019		0.05	N
MNG580164	WS 001	Flow	50050	mgd	10/12/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	10/13/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	10/13/2019		0.25	N
MNG580164	WS 001	Precipitation	193	in	10/14/2019		0.12	N
MNG580164	WS 001	Flow	50050	mgd	10/14/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/15/2019		0.26	N
MNG580164	WS 001	Precipitation	193	in	10/16/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/16/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	10/17/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/17/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	10/18/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/18/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	10/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/19/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/20/2019		0.21	N
MNG580164	WS 001	Flow	50050	mgd	10/20/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	10/21/2019		1	N
MNG580164	WS 001	Flow	50050	mgd	10/21/2019		0.32	N
MNG580164	WS 001	Precipitation	193	in	10/22/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/22/2019		0.28	N
MNG580164	WS 001	Precipitation	193	in	10/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/23/2019		0.24	N
MNG580164	WS 001	Precipitation	193	in	10/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/24/2019		0.27	N
MNG580164	WS 001	Precipitation	193	in	10/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/25/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/26/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/26/2019		0.21	N
MNG580164	WS 001	Precipitation	193	in	10/27/2019		0.01	N
MNG580164	WS 001	Flow	50050	mgd	10/27/2019		0.22	N
MNG580164	WS 001	Precipitation	193	in	10/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/28/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/29/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/29/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	10/30/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/30/2019		0.20	N
MNG580164	WS 001	Precipitation	193	in	10/31/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	10/31/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/1/2019		0.08	N
MNG580164	WS 001	Flow	50050	mgd	11/1/2019		0.18	N
MNG580164	WS 001	Precipitation	193	in	11/2/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/2/2019		0.18	N
MNG580164	WS 001	Precipitation	193	in	11/3/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/3/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	11/4/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/4/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/5/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/5/2019		0.13	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/6/2019		7.9	N
MNG580164	SD 003	pH	400	SU	11/6/2019		8.11	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/6/2019	<	1	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/6/2019		0.77	N
MNG580164	SD 003	Flow	50050	mgd	11/6/2019		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/6/2019		0.8	N
MNG580164	WS 001	Precipitation	193	in	11/6/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/6/2019		0.15	N
MNG580164	SD 003	Oxygen, Dissolved	300	mg/L	11/7/2019		7.1	N
MNG580164	SD 003	pH	400	SU	11/7/2019		8.19	N
MNG580164	SD 003	Solids, Total Suspended (TSS)	530	mg/L	11/7/2019	<	1	N
MNG580164	SD 003	Phosphorus, Total (as P)	665	mg/L	11/7/2019		0.76	N

Permit Number	Station	Parameter Name	Parameter Code	Units	Date of Sample (mm/dd/yyyy)	Qualifier ['<' or '>']	Reported Value	Var. of Op. ['N', 'T', 'S']
MNG580164	SD 003	Flow	50050	mgd	11/7/2019		1.3	N
MNG580164	SD 003	BOD, Carbonaceous 05 Day (20 Deg C)	80082	mg/L	11/7/2019		0.9	N
MNG580164	WS 001	Precipitation	193	in	11/7/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/7/2019		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/8/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/8/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/8/2019		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/9/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/9/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/9/2019		0.14	N
MNG580164	SD 003	Flow	50050	mgd	11/10/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/10/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	11/10/2019		0.13	N
MNG580164	SD 003	Flow	50050	mgd	11/11/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/11/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/11/2019		0.15	N
MNG580164	SD 003	Flow	50050	mgd	11/12/2019		1.3	N
MNG580164	WS 001	Precipitation	193	in	11/12/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/12/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/13/2019		0.03	N
MNG580164	WS 001	Flow	50050	mgd	11/13/2019		0.10	N
MNG580164	WS 001	Precipitation	193	in	11/14/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/14/2019		0.09	N
MNG580164	WS 001	Precipitation	193	in	11/15/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/15/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/16/2019		0.09	N
MNG580164	WS 001	Flow	50050	mgd	11/16/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/17/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/17/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/18/2019		0.17	N
MNG580164	WS 001	Flow	50050	mgd	11/18/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/19/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/19/2019		0.11	N
MNG580164	WS 001	Precipitation	193	in	11/20/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/20/2019		0.16	N
MNG580164	WS 001	Precipitation	193	in	11/21/2019		0.4	N
MNG580164	WS 001	Flow	50050	mgd	11/21/2019		0.17	N
MNG580164	WS 001	Precipitation	193	in	11/22/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/22/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/23/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/23/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/24/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/24/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/25/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/25/2019		0.13	N
MNG580164	WS 001	Precipitation	193	in	11/26/2019		0.27	N
MNG580164	WS 001	Flow	50050	mgd	11/26/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/27/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/27/2019		0.14	N
MNG580164	WS 001	Precipitation	193	in	11/28/2019		0	N
MNG580164	WS 001	Flow	50050	mgd	11/28/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/29/2019		0.14	N
MNG580164	WS 001	Flow	50050	mgd	11/29/2019		0.15	N
MNG580164	WS 001	Precipitation	193	in	11/30/2019		0.16	N
MNG580164	WS 001	Flow	50050	mgd	11/30/2019		0.14	N

Appendix 21

I/I Calcs

SILAK 152875 - PER/ER

Calculations set to Automatic

Flows and Loads

AWW & ADW Summary

01.22.2020

ADW Evaluation
GW normal & no runoff

ADW	0.074 mgd
AWW	0.189 mgd

1. Avg 7 days of no Rain outside of HGW months

Normal Groundwater Months

Year	End	Start
2016		10/31/2016
2017	3/1/2017	10/31/2017
2018	3/1/2018	10/31/2018
2019	3/1/2019	10/31/2019
	11/30/2019	

		Count
Avg Flow	0.106 mgd	201
Stdev	0.029 mgd	

Flow outside of HGW months = normal groundwater, & days with no rain = no runoff

2. 30 Days of Min Rainfall - Smallest

	Smallest	K	Date	Count
Min 30 Rain	0.01	1	1/12/2018	2
Avg Flow	0.074 mgd			
Stdev	0.008 mgd			

3. 30 Days of Min Rainfall - Precentile

	Percentile	K	Date	Count
Min 30 Rain	0.42	0.1	11/28/2017	121
Avg Flow	0.104 mgd			
Stdev	0.033 mgd			

AWW Evaluation
Wettest 180 Consecutive Days (Nov 15-May 15 or May 15-Nov 15)

1. Within Window

		Date	Count
Max 180 Rain	31.76 in	11/1/2019	3
Total Flow	34.0 mg	Stdev	0.1
Avg Flow	0.189 mgd		

2. Outside Window

		Date	Count
Max 180 Rain	33.86 in	10/1/2019	1
Total Flow	35.8 mg	Stdev	–
Avg Flow	0.199 mgd		

PIWW & PHWW
Values used in wq-wwtp5-20a

High Groundwater Months

Year	Start	End
2016	9/1/2016	9/15/2016
2017	5/15/2017	9/15/2017
2018	5/15/2018	9/15/2018
2019	5/15/2019	9/15/2019

High Groundwater Months

	Avg	Stdev	Count
7 days of no Rain	0.103	0.031	28
5 yr 1 hr Storm	0.246	0.093	3
25 yr 1 hr Storm		–	0

I&I Evaluation

AWW	0.189	AWW	0.189	AWW	0.189
ADW	0.074	Permit	0.139	80% Permit	0.111
I&I	0.115	Required Reduction	0.05	Required Reduction	0.078

% Reduction	10	20	30	40	50	60	70
I&I	0.104	0.092	0.081	0.069	0.058	0.046	0.035
ADW	0.074	0.074	0.074	0.074	0.074	0.074	0.074
I&I	0.104	0.092	0.081	0.069	0.058	0.046	0.035
AWW	0.178	0.166	0.155	0.143	0.132	0.12	0.109

	AWW	5 yr 1 hr	25 yr 1 hr
	0.189	0.246	0.787
7 days of no Rain	0.103	0.103	0.103
Inflow	0.086	0.143	0.684

7 days of no Rain	0.103
ADW	0.074
Infiltration	0.029

AWW	0.189 *calculated
Maximum 180 day	0.139 *record drawings
	0.050 How much to reduce to prevent pond expansion

Infiltration - Gallons per ft

	Length	Count	DIA (in)	Length (ft)	New Pipe
8" PVC			8	12810	1941
8" VCP/Old Pipe			8	16445	2492
4" Service New	50	41	4	2050	155
4" Service Old	50	336	4	16800	1273

Total I&I	115000
I&I from new	5861
I&I availble for removal	109139

I&I Reducable areas

	Length	Count	DIA (in)	Length (ft)	I&I
8" VCP/Old Pipe			8	16445	72239.52
4" Service Old	50	336	4	16800	36899.48
					109139

0 goal seek equation

2899.24 Reducable I&I gal per inch per mile per day

	Length	Count	DIA (in)	Length (ft)	New Pipe
% City Replaced		0.72			
8" Sanitary Sewer			8	11840.4	52,012
4" Service	50	241.92	4	12096	26,568
					78,580

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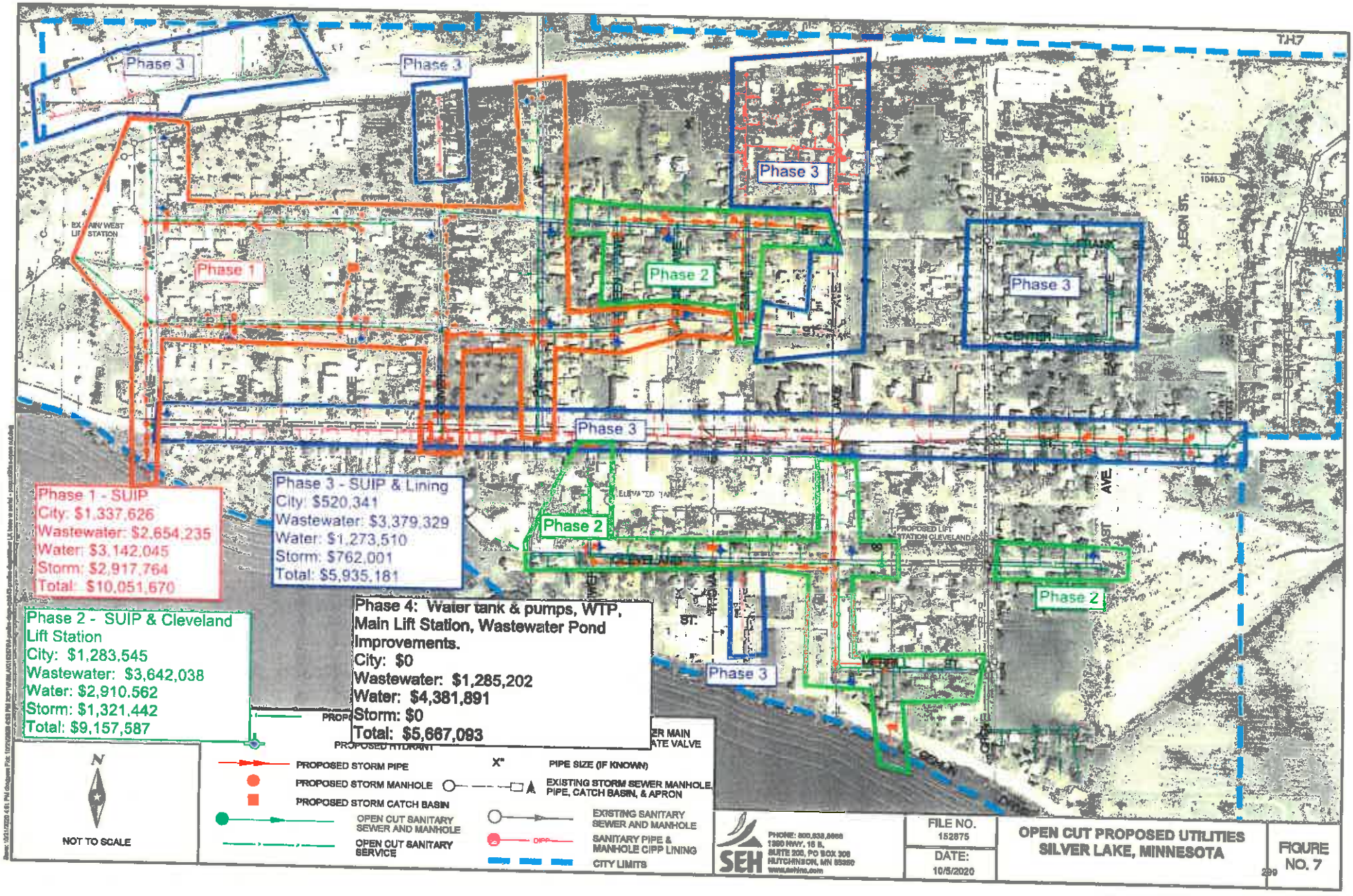
Phase 3
Phase 3
Phase 3
Phase 1
Phase 2
Phase 3
Phase 3
Phase 2
Phase 2
Phase 3
TH7
Phase 1 - SUIP
City: $1,337,626
Wastewater: $2,654,235
Water: $3,142,045
Storm: $2,917,764
Total: $10,051,670
Phase 3 - SUIP & Lining
City: $520,341
Wastewater: $3,379,329
Water: $1,273,510
Storm: $762,001
Total: $5,935,181
Phase 2 - SUIP & Cleveland Lift Station
City: $1,283,545
Wastewater: $3,642,038
Water: $2,910,562
Storm: $1,321,442
Total: $9,157,587
Phase 4: Water tank & pumps, WTP, Main Lift Station, Wastewater Pond Improvements.
City: $0
Wastewater: $1,285,202
Water: $4,381,891
Storm: $0
Total: $5,667,093
N
NOT TO SCALE
PROPOSED STORM PIPE
PROPOSED STORM MANHOLE
PROPOSED STORM CATCH BASIN
OPEN CUT SANITARY SEWER AND MANHOLE
OPEN CUT SANITARY SERVICE
X"
PIPE SIZE (IF KNOWN)
EXISTING STORM SEWER MANHOLE, PIPE, CATCH BASIN, & APRON
EXISTING SANITARY SEWER AND MANHOLE
SANITARY PIPE & MANHOLE CIPP LINING
CITY LIMITS
SEH
FILE NO. 152875
DATE: 10/5/2020
OPEN CUT PROPOSED UTILITIES
SILVER LAKE, MINNESOTA
FIGURE NO. 7