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FINAL REPORT | Prepared for
Alexandria Lake Area Sanitary District

ALASD
Alexandria Lake Area Sanitary District
Restoring Our Water for a Healthier Natural Environment

ALASD Water Reclamation Facility Plan

February 2023

Facility Plan

Prepared for
Alexandria Lake Area Sanitary District (ALASD)
Water Reclamation Facilty
Alexandria, MN
February 28, 2023

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.

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List of Abbreviations

ALASD	Alexandria Lake Area Sanitary District
BC	Brown and Caldwell
BCE	Business Case Evaluation
BNR	Biological Nutrient Removal
CB	Catch Basin
CBOD5	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
CWRF	Clean Water Revolving Fund
DAF	Dissolved Air Flotation
DAFT	Dissolved Air Flotation Thickener
DNR	Department of Natural Resources
DO	Dissolved Oxygen
EBPR	Enhanced Biological Phosphorus Removal
EIW	Environmental Information Worksheet
EQ	Equalization
FEMA	Federal Emergency Management Agency
GPR	Ground Penetrating Radar
HEX	Heat Exchanger
HVAC	Heating Ventilation and Air Conditioning
IUP	Intended Use Plan
LS	Lift Station
MBR	Membrane Bioreactor
MF	Microfiltration
MG	Million Gallons
MLSS	Mixed Liquor Suspended Solids
MPCA	Minnesota Pollution Control Agency
NF	Nanofiltration
NPDES	National Pollutant Discharge Elimination System
NPV	Net Present Value
O&M	Operations and Maintenance
PAA	Peracetic Acid
PEL	Preliminary Effluent Limit
PIWWF	Peak Instantaneous Wet Weather Flow
PPL	Preliminary Permit Limit
PPL	Project Priority List
PSIG	Pounds Per Square Inch Gauge
PSIG	Point Source Implementation Grant
RAS	Return Activated Sludge
RO	Reverse Osmosis
SAF	Suspended Air Flotation
SIU	Significant Industrial User
TBEL	Technology Based Effluent Limits
TDS	Total Dissolved Solids
TM	Technical Memorandum
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
US EPA	United States Environmental Protection Agency
UV	Ultraviolet
VI	Vapor Intrusion
WAS	Waste Activated Sludge
WIF	Water Infrastructure Fund
WQBEL	Water Quality Based Effluent Limit
WTP	Water Treatment Plant
WWTF	Wastewater Treatment Facility – previous name for existing ALASD treatment facility
WRF	Water Reclamation Facility – new name for ALASD treatment facility

Executive Summary

Clean water is critical to the heath of the local community and to the natural environment. In the 1970's, Alexandria Lake Area Sanitary District (ALASD) led in the protection and preservation of the area lakes with the regionalization of wastewater collection and treatment in the Alexandria lake area. ALASD's treatment facility was constructed from 1976 to 1978. ALASD continued the legacy of environmental stewardship in the following decades to drastically lower phosphorus levels in Lake Winona and downstream lakes. Despite achieving permit compliance with the WWTF effluent discharge requirements, Total Maximum Daily Load (TMDL) studies for Lake Winona indicate further measures are needed to remove excess nutrients from the wastewater discharge to improve water quality.

ALASD began this recent facility planning effort in March 2022 to define future improvements needed and to meet the State of Minnesota Clean Water Revolving Fund requirements. Facility improvements are necessary for the following reasons:

- Future regulations require advanced treatment to meet more stringent total phosphorus limits as required by the ALASD's wastewater discharge permit.
- Significant residential growth and industrial expansions have caused the facility to operate near capacity at times.
- Much of the facility is over 45 years old.

In addition to nutrient impairments. ALASD is facing emerging issues such as chloride impairments to Lake Winona, future sulfate limits due to impairments 30-miles downstream in the Long Prairie River, and monitoring for PFAS compounds being discharged to the ALASD sewer system.

It is with these existing and future challenges in mind that ALASD has elected to consider treatment technology to provide the highest available effluent quality and provides a path forward to address further treatment scenarios for potential future permit conditions.

As outlined in Section 5 of this report, various alternatives and recommendations were presented for each unit process.

Recommendations and costs are outlined in Section 7 based on the following improvements:

- Influent wetwell improvements and Equalization basin storage for peak wet weather events
- Replace influent screens with new perforated plate screens and relocate one in the third screening channel to make space for new grit processing equipment
- Replace grit processing equipment
- Membrane Bioreactor (MBR) filtration with primary treatment and biological phosphorus removal
- Convert dissolved air floatation thickener to suspended air floatation thickener
- Replace aerobic digestion system chiller with larger unit and replace fine bubble diffuser system and header aeration piping
- Install redundant dewatering centrifuge and expand or new solids dewatering building
- Reclaim existing biosolids storage pad and provide partial fabric cover
- Disinfection improvements including sodium hypochlorite/sodium bisulfite back-up system

In addition to capital, operations and maintenance costs, non-monetary factors were also reviewed and are provided as follows. The recommended MBR alternative provides ALASD with:

- The most robust and resilient treatment process which is critical given recent high industrial loadings have caused nitrification toxicity and poor sludge quality issues,
- Reliable and excellent phosphorus removal capability to meet projected lower phosphorus discharge requirements and highest effluent quality,
- The most “phasable“ approach to minimize near-term and long-term capital improvements, and
- The simplest and least expensive path forward to reduce chloride discharges using future on-site RO treatment combined with ALASD’s current source reduction measures if a chloride variance is no-longer available as part of future discharge permits.

Due to the higher effluent quality that will be achieved with the recommended upgrades, the name of the new facility will be updated to the ALASD Water Reclamation Facility (WRF).

Finally, rate impacts were reviewed in Section 8 along with potential funding sources. Total capital costs for recommended improvements as of 2022 were estimated at $67.4 million.

Public comments were solicited during the 30-day public comment period ending on February 17, 2023, and at the Facility Plan Public Hearing held on February 8, 2023. Comments and responses are included in this final facility plan report to be submitted to the Minnesota Pollution Control Agency.

Section 1

Introduction

The Alexandria Lake Area Sanitary District (ALASD) was established in the 1971 by the Minnesota Legislature as a political subdivision of the State. Alexandria Lake Area Sanitary District (ALASD) is located in western Minnesota in Douglas County.

The ALASD service area covers 102 square miles including water bodies. ALASD operates and maintains a wastewater treatment facility (WWTF) and wastewater collection system. The ALASD collection system is not evaluated or included in this facility planning effort. Local units of government within ALASD service area include: the City of Alexandria and the Townships of Alexandria, Carlos, Hudson, Ida, LaGrand and Lake Mary. In addition, ALASD provides contract services to the City of Nelson, the City of Forada, a portion of Leaf Valley and Miltona Townships, and the Carlos State Park. Figure 1-1 presents the existing ALASD sewer district boundary.

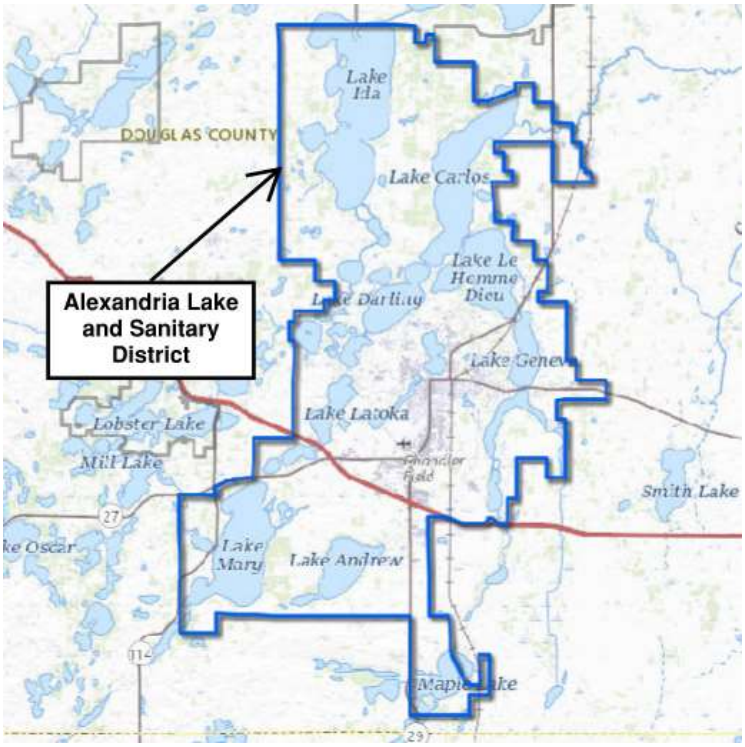


Figure 1-1. ALASD Sewer District Boundary

1.1 Facility Description

ALASD's WWTF was constructed from 1976 to 1978. Previous capacity expansion was completed in 2008, and solids capacity upgrades were completed in 2016. Future regulations require additional treatment to meet nutrient limits and prevent degradation of receiving waters. Increased residential, commercial, and industrial flow and load to ALASD has caused the facility to operate near capacity. Future growth projections include commercial and industrial growth as well as increased residential

population in the ALASD service area. In addition, much of the facility is 45 years old and requires rehabilitation or replacement. The WWTF liquid processes consist of the following:

- Influent pump station
- Two perforated screens, screenings compactors and vortex grit removal
- Two primary clarifiers
- Three activated sludge aeration basins
- Three secondary clarifiers
- Three cloth disk filter systems
- Two chlorine contact tanks with gaseous chlorine disinfection and sodium bisulfite dechlorination
- Plant effluent outfall into Lake Winona

The WWTF solids processing includes the following:

- Dissolved air flotation thickener for waste activated sludge (WAS)
- Four aerobic digesters
- Centrifuge
- Biosolids storage pad

Refer to Figure 1-2 for a map of the WWTF.

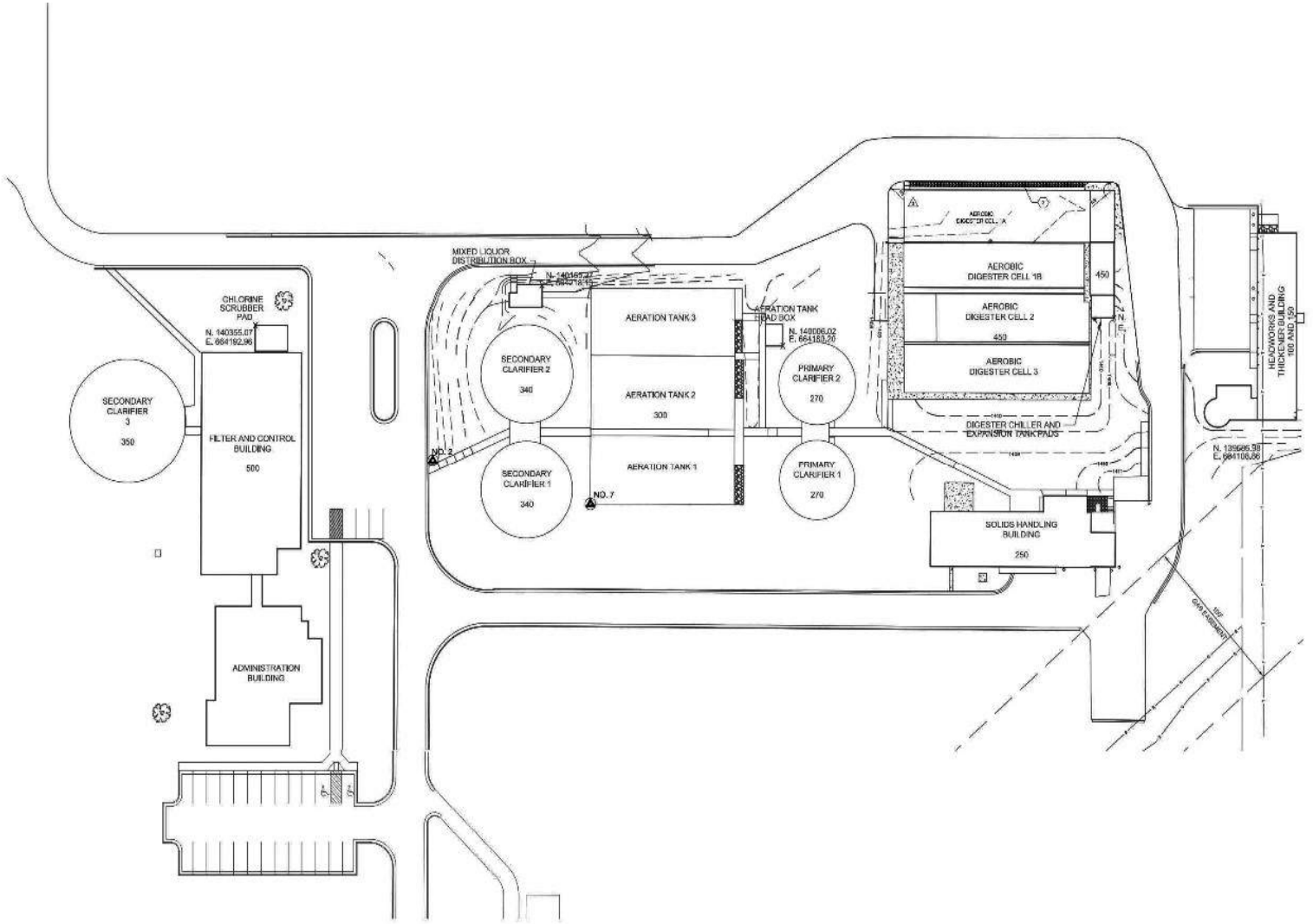


Figure 1-2. WWTF Map

1.2 Existing Site Conditions

The existing plant outfall is directed to Lake Winona, which forms an interconnected chain with Lake Agnes, Lake Henry, through a wetland to Lake Le Homme Dieu, Lake Carlos, and finally discharges to the Long Prairie River. Lake Winona, Lake Agnes, and Lake Henry are designated as impaired waters for chloride and nutrients.

The Environmental Information Worksheet (EIW) has been prepared and will be submitted to the MPCA with the Facility Plan. The EIW is included in Appendix A.

1.2.1 Historical, Archaeological, Cultural, and Natural Heritage Review

The EIW requires Section 106 review (36 CFR 800). The Minnesota State Historic Preservation Office's (SHPO) National Register of Historic Places database was searched to obtain information on any known historical or archaeological sites in the project area. There are no historical, archaeological, or cultural areas within the project boundaries. Adjacent properties are not anticipated to be adversely impacted. Tribal consultation was exempt from the review as Douglas County was not listed on the MPCA tribal contact list for water permit notices.

The DNR Natural Heritage Review (MCE #: 2022-00896) indicates that there are no endangered or threatened species within the vicinity of the project site, though it does indicate that there is Mudpuppy within the vicinity, a state listed species of concern, Mudpuppy habitat consists of deep-water zones of lakes and littoral zones of lakes. Measures will be taken to minimize impact to Mudpuppy habitat such as dewatering and minimizing surface water discharge into Lake Winona. The U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) Survey indicates that federally designated endangered species are located within the vicinity of the project site. Endangered species include Northern Long-eared Bats and Tricolored Bats, and candidate endangered species include Monarch Butterfly. Migratory birds within the vicinity include Bald Eagles, Black-Billed Cuckoo, Bobolink, Canada warbler, Chimney Swift, Eastern Whip-poor-will, Marbled Godwit, Red-Headed Woodpecker, and Rusty Blackbird. IPaC does not list any critical habitats. The DNR Natural Heritage Review map indicates that the following resources are not within the project site:

- Calcareous Fens
- MBS sites of biodiversity significance
- DNR old growth stands
- DNR native plant communities
- Lakes of biological significance
- USFWS regulatory layers
- Audubon MN important bird area
- Prairie conservation plan areas

1.2.2 Geology, Wetlands, and Soil Conditions

ALASD WWTF site underlying geology consists of extrusive rocks of mafic to felsic composition, associated volcanogenic rocks and derivative graywacke with no susceptible geologic features. According to the Natural Resource Conservation Service (NRCS) soil survey the following soil types are located at the facility site:

- Haslie, Seelyeville, and Cathro soils (1113) – Wet mixed forest, frequently ponded at0 to 1 percent slopes. This soil type is located near the outfall.
- Arvilla sandy loam (AsB) – Sandy prairie at2 to 6 percent slopes. Located to the east of the facility.
- Sandberg loamy sand (D8B/C) – Shallow, sandy gravel at1 to 12 percent slopes. The existing influent pump station, biosolids pad, and stormwater pond are located on this soil type
- Water, Miscellaneous (M-W) – The old polishing ponds from the original plant construction are classified as this and will not be used for this project.
- Udipsamments (cut and fill, Ud) – The majority of the existing plant is located on cut and fill soil.

The soil surrounding the ALASD property is granular is composition, mostly composed of sandy loam. The potential for contaminants to infiltrate into the groundwater through this soil type is high.

There are no wetlands on the existing ALASD site, however, there are freshwater forested wetlands located to the west of the facility and freshwater emergent wetland located at the existing outfall. Previous geotechnical investigations show the groundwater to be roughly 25 feet below grade. The existing site has a stormwater basin to collect surface water runoff and provides sedimentation prior to discharging into Lake Winona

Previous projects at this site have completed soil borings including evaluating both soils and groundwater conditions (including at LS1) and additional soils investigation will be completed as part of the design phase. Additional detailed soils information is included in the EIW form included in Appendix A.

1.2.3 Flood Elevation

According to the Federal Emergency Management Agency (FEMA) 25-year and 100-year floodplain maps, the existing and proposed site will not be within either floodplain. See Appendix A for the FEMA 25-year and 100-year floodplain maps.

Section 2

Flows and Loadings

The current approximate population served by ALASD is over 27,000. Growth projections for ALASD service area was based on information included in the ALASD Comprehensive Wastewater Services Plan (2021) which incorporated projections from the Minnesota State Demographic Center, Douglas County Comprehensive Plan, City of Alexandria 2040 Comprehensive Plan, and Alexandria Area Housing Study Update (2018). To account for residential, industrial, and commercial growth, a 1.5 percent annual flow increase is suggested in the ALASD Comprehensive Wastewater Service Plan. Further explanation of flow and loading projection used for this facility planning effort is provided later in this section.

Significant industrial users (SIUs) in the ALASD service area include TWF Industries, SunOpta Aseptic (SOA), SunOpta Ingredients (SOI), 3M, Douglas Finishing, and Alexandria Extrusion. Correspondence was sent to SIUs in May 2022, to request information on future industrial expansions. SIUs flow and loads are monitored and permitted by ALASD. Industrial pretreatment is not anticipated to be required to meet future nutrient and loading limits, with the exception of future chloride reduction measures. SIU permits are included in Appendix B.

Plant influent flows from January 1, 2017 through April 31, 2022 and influent loadings from May 1, 2021 through April 31, 2022 were selected as representative periods for determining the baseline flows and loadings. The period selected as representative of influent loadings captures recent increases in industrial loading contributions. SIUs were contacted by ALASD in May 2022 requesting information on anticipated increases in discharges to assess future flows and loads to the WTP. Only SOI and SOA reported potential future increases in flows and loads.

Influent flows and loadings were then projected through Year 2045 using three different methods which can be generalized as follows:

- Method 1: 1 percent linear growth using current influent wastewater characteristics
- Method 2A: 1.5 percent compounded growth using current influent wastewater characteristics
- Method 2B: 1.5 percent compounded growth using typical domestic waste sewage strength

Each projection method included a 10 percent industrial growth allocation based upon current reported SOI and SOA combined loadings. Method 2B was selected as the most realistic basis of determining future flows and loadings projections as it represents future conditions with growth being driven by domestic user increases and a lower percent of industrial contributions. Maximum month, week, and day were calculated using peaking factors calculated from historical data.

Table 2-1 presents the Baseline and Year 2035 and 2045 design influent flow and loading projections. Baseline flows are representative of current conditions at the WWTF.

Table 2-1. ALASD WWTF Influent Flows and Loading Projections				
Item	Units	Current	Year 2035	Year 2045
Flows				
Annual Average	mgd	3.1	3.8	4.3
Average Dry Weather	mgd	2.7	3.2	3.7
Average Wet Weather	mgd	4.1	5.0	5.7
Peak Hour Wet Weather	mgd	8.0	9.5	10.9
Peak Instantaneous Wet Weather[c]	mgd	11.9	14.5	16.6
CBOD Demand				
Annual Average	lb/d	5,720	7,200	8,200
Maximum Month	lb/d	6,910	8,700	9,900
Maximum Week	lb/d	7,930	10,000	11,400
Maximum Day	lb/d	10,150	16,200[d]	18,400[d]
Chemical Oxygen Demand[a]				
Annual Average	lb/d	16,600	20,900	23,800
Maximum Month	lb/d	25,000	31,500	35,800
Maximum Week	lb/d	28,700	36,100	41,100
Maximum Day	lb/d	37,400	47,000	53,500
Total Suspended Solids				
Annual Average	lb/d	6,010	7,300	8,300
Maximum Month	lb/d	7,120	8,600	9,800
Maximum Week	lb/d	8,060	9,800	11,100
Maximum Day	lb/d	11,300	12,600[d]	14,300[d]
Ammonia				
Annual Average	lb-N/d	570	700	820
Maximum Month	lb-N/d	650	810	940
Maximum Week	lb-N/d	730	900	1,050
Maximum Day	lb-N/d	840	1,410[d]	1,640[d]
Total Kjeldahl Nitrogen[b]				
Annual Average	lb/d	1,080	1,340	1,550
Maximum Month	lb/d	1,240	1,530	1,780
Maximum Week	lb/d	1,380	1,710	1,980
Maximum Day	lb/d	2,160	2,670	3,100

Table 2-1. ALASD WWTF Influent Flows and Loading Projections				
Item	Units	Current	Year 2035	Year 2045
Total Phosphorus				
Annual Average	lb/d	130	160	190
Maximum Month	lb/d	150	180	210
Maximum Week	lb/d	160	200	230
Maximum Day	lb/d	230	240	280

a. COD based on COD:cBOD5 ratio observed during March 2022 wastewater characterization of 2.90.
b. TKN based on ammonia-N:TKN ratio observed during March 2022 wastewater characterization of 0.53.
c. Peak instantaneous flow of 11.9 mgd to be used as discussed in Flows and Loads Workshop.
d. Maximum day peaking factors of 2.25 for cBOD5 and TSS of 2.25 and 2.0 for ammonia-N was used as discussed in Flows and Loads Workshop.

The monthly permitted limits used for this facility plan are a five-day carbonaceous biochemical oxygen demand ($cBOD_5$) concentration of less than 15 mg/L, total suspended solids (TSS) of less than 11 mg/L, total nitrogen (TN) of 8 mg N/L, and total phosphorus (TP) of 0.11 mg P /L. Concentrations were calculated from the permitted monthly mass loading using the projected 2045 annual wet weather flow of 5.7 mgd. Future permitted levels also considered in this report was a daily maximum chloride concentration of 252 mg/L. Permit levels are discussed in further detail in Section 5.2 Liquids Treatment and are referred to as Treatment Levels 1 and 2.

Peak wet weather flow events were considered as part of this facility plan, in part, due to recent flooding events in 2022 and to address climate resiliency. To accommodate infrequent, peak wet weather flow events over 9.5 mgd, flow equalization (EQ) at the facility headworks was evaluated and is discussed in more detail in Section 5.1 Headworks. Providing EQ at the headworks decreases sizing requirements of downstream processes, ultimately reducing construction costs of new facilities.

The Influent Flows and Loadings technical memorandum (TM) is located in Appendix C.

Section 3

Regulatory

The ALASD WWTF is authorized under NPDES Permit No. MN0040738. ALASD's current NPDES permit was issued November 15, 2020, and expires October 31, 2025 (Appendix D). The current NPDES permit includes a compliance schedule which requires more stringent phosphorus limits and includes a variance for total chloride water quality based effluent limit. A variance is a temporary change in water quality standards (WQS). The MPCA has determined that compliance with chloride WQS is not feasible or affordable at this time. However, the facility plan alternatives analysis evaluated processes that provide a logical progression in technology that will support future treatment technology to reduce chlorides the future. Current efforts by ALASD are underway to reduce chloride sources to the WWTF system through residential and industrial discharges.

3.1 Discharge Location

The ALASD WWTF discharges treated wastewater effluent to Lake Winona. Two alternative discharge locations have been previously evaluated. It is recommended that the WWTF continue to discharge to Lake Winona.

3.1.1 Long Prairie Discharge

Discharge to the Long Prairie River was reviewed initially in 2013 and evaluated again in 2017 to address more stringent regulations including nutrients and chlorides. Based on these evaluations, it was determined that upgrading the existing wastewater treatment process to meet future nutrient limits in Lake Winona was more cost-effective than constructing a pumping station and an 18-mile long forcemain to the Long Prairie River. Additionally, this discharge location does not relieve the requirement to meet chloride standards. Most of the current proposed treatment plant improvements would still be required in addition to the cost of an effluent pumping station and forcemain. Furthermore, relocating the discharge would require extensive permitting processes, and public acceptance of a new discharge location may be difficult.

3.1.2 Deep Well injection

Deep well injection consists of discharging treated wastewater deep into subsurface geologic formations. Injection wells within Minnesota are regulated under US EPA Region V, Underground Injection Control (UIC) program. USEPA recognizes six categories of injection wells, designated Class I through Class VI. Municipal wastewater disposal wells fall within Class I. Class I wells are defined as industrial and municipal waste disposal wells injecting fluids into a geologic formation that is below the lowermost formation containing an Underground Source of Drinking Water (USDW).

Approximately 800 operational Class I wells exist within the United States. About 240 of the 800 operations Class I wells are used to inject municipal wastewater. This study was unable to find any Class I injection wells that have been permitted or operated in Minnesota. Several U.S. EPA Region V states have either permitted or are in the process of permitting Class I injection wells including Michigan, Ohio, and Illinois. Class I wells in these states are completed in sedimentary formations, often in karst terrains.

Deep well injection was ruled out as a viable alternative at this time due to permitting challenges and barriers and the initial review of geological conditions. No existing deep-well injection has been

permitted to date in Minnesota. Deep well injection is likely to be challenging in Douglas County based on Brown and Caldwell's 2016 geological evaluation.

3.2 Preliminary Effluent Limits (PEL)

ALASD submitted a preliminary effluent limits (PEL) request to the MPCA in July 2022, and the revised PEL letter was received in December 2022. The revised PEL letter is located in Appendix E. Expansion levels assumed that the ALASD effluent would continue to be discharged to Lake Winona at the existing outfall location. The Review of Preliminary Effluent Limits for Expansion Scenarios TM is also located in Appendix E. New and expanded NPDES permits that result in net increases in pollutant loading to surface waters are required to undergo an antidegradation review (Minn. R. 7050.0280). In order to comply with the antidegradation requirements the permittee must choose one of the two following options:

1. "Cap" mass limit at their current levels in lieu of an antidegradation review or

2. Submit an antidegradation review that meets the antidegradation requirements.

One set of PELs provided by the MPCA in the December 2022 revised letter assume 'capped' limits, and the other set assume that ALASD would perform an antidegradation analysis to justify higher limits. Both sets of PELs and presented below in Table 3-1.

Table 3-1. Comparison of Mass Limits – MPCA PEL vs. Limits Projected with Antidegradation Analysis

Parameter	Averaging Period of Mass Limit	Flow Basis of Mass Limit, mgd			Concentration Basis of Limit, mg/L			Mass Limit, units of kg/d unless otherwise noted		
									2045	
		Existing	PEL w/o Antideg. Analy.	PEL w/ Antideg. Analy.	Existing	MPCA PEL w/o Antideg. Analy.	MPCA PEL w/Antideg. Analy.	Existing	PEL w/o Antideg. Analy.	PEL w/ Antideg. Analy.
CBOD5	max. daily	3.0	3.0	5.7	25	25	25	282	282	539
TSS	max. daily	3.0	3.0	5.7	30	30	30	339	339	647
Total chloride - final	max. daily	NA	NA[1]	NA[1]	NA	252	252	NA	NA[a]	NA[a]
	avg. monthly	NA	4.7	5.7	NA	230	230	NA	4,092	4,962
Total chloride - interim	max. daily	NA	NA[1]	NA[1]	NA	839	839	NA	NA[a]	NA[a]
Total dissolved salts	max. daily	NA	4.7	5.7	NA	1,940	3,458	NA	34,512	no limit likely
Total sulfate	12-mo. rolling total	NA	NA[b]	NA[b]	NA	NA[2]	NA[2]	NA	1,077,866 kg/yr	1,077,866 kg/yr
Total copper	max. daily	NA	4.7	5.7	NA	0.040	0.125	NA	0.712	no limit likely
Total zinc	max. daily	NA	4.7	5.7	NA	0.114	0.225	NA	2.03	no limit likely
Total mercury	max. daily	NA	4.7	5.7	NA	2.96E-06	1.68E-05	NA	53 mg/d	no limit likely
Total phosphorus - final	12-mo. moving avg.	4.7	4.7	4.7	0.105	0.105	0.105	665	665	665
Total phosphorus - interim	12-mo. moving avg.	4.7	4.7	4.7	0.167	0.167	0.167	1,087	1,087	1,087

a. *MPCA identified max. daily concentration PELs for chloride—interim (839 mg/L) and chloride—final (252 mg/L) but not max. daily mass limits.*
b. *MPCA did not identify the flow and concentration basis of the sulfate mass PEL but describes it as the "current full authorized load".*

The PELs provided by MPCA confirm that an antidegradation assessment would not change the concentration PELs but would likely result in higher mass limits for some parameters (Table 3-2) and would eliminate the need for limits for some constituents. Although ALASD might be able to comply with limits based on existing (frozen) loadings for some period into the future, higher limits might ultimately be needed to accommodate increased effluent flows or changes in effluent quality. In the December 15, 2022 discussion, MPCA confirmed that ALASD could initially accept frozen mass limits, and still gain relief from those limits in the future by performing an antidegradation evaluation. However, there could be some benefits to the public review process if the antidegradation evaluation was performed in conjunction with the expansion.

An antidegradation evaluation would follow well-established guidance MPCA. For most parameters, an antidegradation analysis would be relatively straightforward because end-of-pipe limits would attain water quality criteria even at higher effluent flows. Relatively simple technical approaches could be taken to also evaluate the impact of the expanded discharge on concentrations in Lake Winona and the Long Prairie River. The antidegradation analysis could require additional analysis of the following parameters:

- **CBOD5.** The antidegradation assessment might have to rule out the possibility of local or far field DO impacts under high CBOD5 loading levels.
- **Sulfate.** The antidegradation assessment would seek to demonstrate that the ALASD discharge does not cause exceedances of the wild rice-based sulfate criterion, and that a mass cap would protect wild rice.
- **Mercury.** Because a statewide TMDL exists, an antidegradation assessment might need to demonstrate that a mass cap is not practicable, and that the potential for mercury bioaccumulation is not significantly increased. The latter conclusion would primarily be based on the attainment mercury criteria end-of-pipe, but would also show a de minimis increase in regional mercury loading

Table 3-2. Summary of PEL Review Results		
Parameter	Potential Outcome of Antidegradation Assessment, Compared to PEL	Requirements for Antidegradation- Based Relief from Mass Cap
CBOD5	Higher mass limits; requires finding of no local DO impacts	Secondary treatment; no local or far field impacts on dissolved oxygen
TSS	Higher mass limits	Secondary treatment: Technology Based Effluent Limits & criteria attained end-of-pipe
Fecal coliform	No change	NA
pH	No change	NA
Total residual chlorine	No change	NA
Chloride	Possible higher mass limits	Mass cap cannot be economically attained
TDS	No WQBEL needed / higher mass limits	Criteria attained end-of-pipe
Sulfate	No WQBEL needed / higher mass limits	Criteria attained end-of-pipe; no impacts on wild rice ~30 miles downstream of discharge
Copper	No WQBEL needed / higher mass limits	Criteria attained end-of-pipe
Zinc	No WQBEL needed / higher mass limits	Criteria attained end-of-pipe
Mercury	No WQBEL needed / higher mass limits	Criteria attained end-of-pipe; no increase to bioaccumulation potential.
Phosphorus	No change	NA

Section 4

Condition Assessment

A condition assessment site visit was conducted on May 24, 2022. The primary activities consisted of a site walk and tour of each building, photo documentation, recording equipment nameplate data, and discussions with plant staff.

The plant was operating under normal conditions during the site visit, which meant that certain equipment and structures were in service and not visible or accessible for internal inspection. Primary Clarifier 2 and Aerobic Digester Cell 3 were emptied to allow visual inspections of the structures. Internal condition of aeration tanks, lift station wet well, and pumps could not be visually inspected. Conditions of these items were assumed based on age and discussions with facility staff.

Based on this site visit and discussions with plant staff, the following equipment listed in Table 4-1 is recommended for repair/replacement. The costs for the repair/replacement of these items are included in the alternatives evaluations for each process area.

Additionally, the information collected from the condition assessment, including photographs and nameplate data, was provided for input into the ALASD asset management database. This database will continue to be populated with future infrastructure data as well as O&M data as part of future capital projects.

4.1 Condition Assessment Recommendations

The Condition Assessment TM is located in Appendix F. Recommendations are summarized below in Table 4-1.

Table 4-1. Recommendations for Replacement/Repair

Equipment	Recommendation
Influent Flow Metering	Upsize flow meter pipe from 10" to 14" if equalization is not provided
Influent Pipe	Upsize to 24" pipe from the Influent Pumping Station to the Solids Handling Building if equalization is not provided
Screen 2	May require refurbishment due to age
Headworks Electrical Room	Seal openings and/or investigate HVAC improvements to prevent odorous air entering from dumpster room
Vortex Grit System	Bridge coating system has failed and requires refurbishment Repair or replace hatch adjacent to Grit Tank to close tightly. Add insulation to the underside of the hatch.
Grit Washer	Model has been discontinued, replacement parts may become difficult to acquire, requires replacement
Grit Piping	Replace grit piping due to wear and age
Primary Clarifiers	Replace baffles and v-notch weirs due to corrosion. Repair concrete step to the bridge on Primary Clarifier 1. Refurbish coating system on the bridges and collector mechanisms.
Aeration Blower Air Header	Poor condition and leaks, requires replacement
Aeration Tank Air Distribution System	Replace aeration distribution systems in tanks 1 and 2 at due to age

Table 4-1. Recommendations for Replacement/Repair	
Equipment	**Recommendation**
Secondary Clarifiers	Refurbish coating system on bridges
Filters	Existing equipment will not meet current regulations. Replace with a new filtration system technology.
Chlorination System	Current chlorinator units are near the end of their useful life, requires replacement
Ferric Sulfate System	Replace piping and inspect injector (replace if needed)
DAF	Evaluate whether the system can be re-utilized as a surface air flotation (SAF) thickening system or replaced by another technology, system has been problematic and difficult to control
Digester Cell Membrane Diffusers and PVC Distribution Pipe	Diffuser systems are near the end of their useful life and distribution piping is 15+ years old, requires replacement in all cells
Chiller	Multiple maintenance issues and at the end of its useful life, requires replacement
Plant Water Pumps	Replace plant water pumps and piping due to high corrosion
Centrifuge	Evaluate a backup solids de-watering system
Polymer Blending Unit	Multiple maintenance issues and at the end of its useful life, requires replacement
Biosolids Storage Pad	Replace pad in-kind or evaluate biosolids storage options
Building 1: Influent Pump Station and Wet Well	Refurbish floor paint. Repair concrete at the bottom of the stairs. Access shaft to wet well shows corrosion and requires refurbishment.
Building 2: Office	Repair roof leakage in corridor to Filter and Control Building
Building 3: Filter and Control	Refurbish floor paint. Repair concrete around hatch.
Building 4: Solids Handling	Recoat embedded steel angles and repair the concrete columns in loadout area Refurbish floor paint Replace windows that leak in centrifuge room Repair roof leak in polymer room Repair the g in the floor slab below overhead door Repair cracks in blower room floor Re-slope exterior dock
Building 5: Headworks and DAFT	South side of lower roof requires handrail to be installed Repair or replace hatch adjacent to Grit Tank to close tightly. Add insulation to the underside of the hatch Corroded generator base to be repaired and repainted Cracks in exterior wall panels to be repaired

4.2 Asset Management System

ALASD maintains a GIS-based asset management system of the collection system assets and is currently updating the database to include the WWTF unit processes and equipment. Documentation and photos of equipment and structures from the WWTF condition assessment were entered into the asset management system. Proposed improvements including operations and maintenance information will be added to ALASD's asset management system during the design and construction services contract. A screenshot of ALASD's asset management system is presented in Figure 4-1.

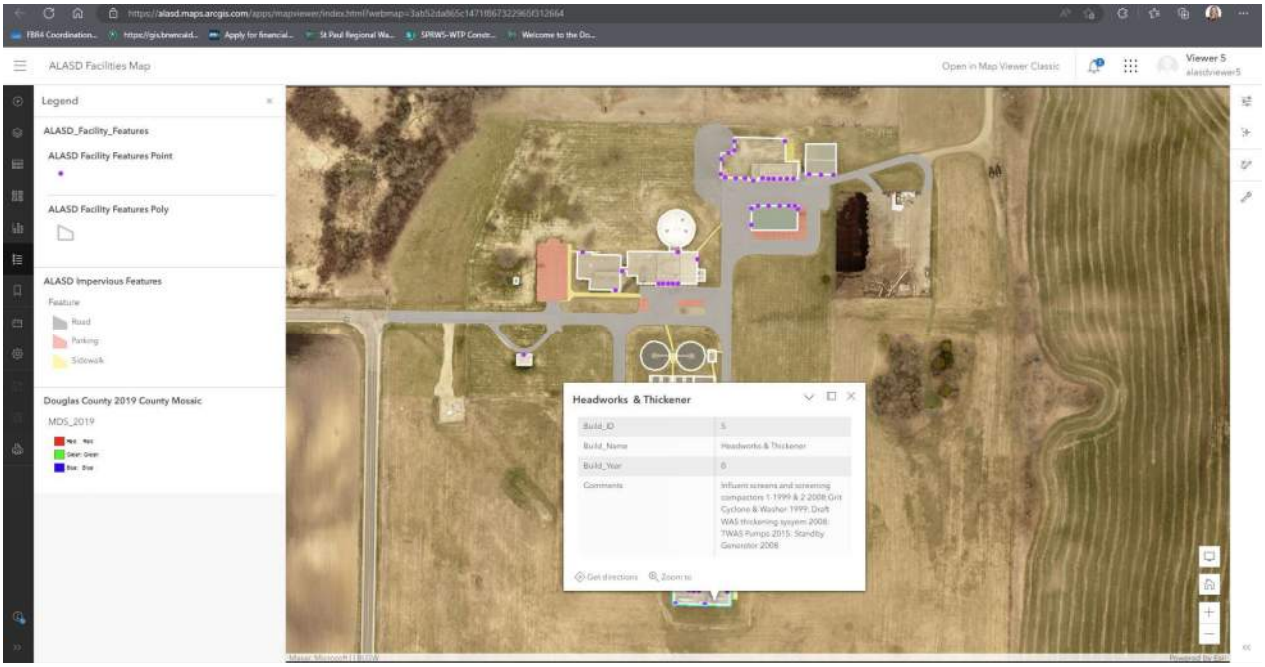


Figure 4-1. ALASD Asset Management System

Section 5

Alternatives Evaluation

Alternative evaluations were completed for each process area to meet Year 2045 flow and loading projections. A business case evaluation (BCE) comparing the life-cycle costs of each alternative was completed. This section summarizes the alternatives, cost estimates, operability considerations, non-monetary factors, and the recommendation for each process area. A flow schematic for the recommended configuration is presented in Figure 5-1. Collection system improvements were not evaluated as part of this study, except as describe below in the Equalization (EQ) pumping section.

5.1 Headworks

Alternatives were evaluated for flow equalization (EQ), influent pumping, screening, and grit processing. The Headworks Alternative Evaluation TM is located in Appendix G.

5.1.1 Equalization (EQ)

To meet the proposed liquids treatment alternatives design plant flow of 9.5 mgd, flow equalization will be required for peak wet weather events. Excess flow over 9.5 mgd will be diverted to an EQ retention basin to prevent peak wet weather events from flooding system processes. PIWWF is based on a 5-year storm event, and it is assumed that EQ will be used an average of 4 days per year. Based on these design criteria, 1.5 million gallons (MG) is required for EQ.

Two alternatives were evaluated for flow equalization: (1A) a 1.5 MG prestressed concrete tank, and (1B) lining the existing basin located on the northwestern portion of the ALASD site. The maximum hydraulic grade line (HGL) in the wetwell (1377 feet) is lower than the invert elevation of the existing basin (1385 feet) or proposed concrete tank; therefore, pumping will be required to divert flows for both alternatives. The equalization tank/basin will drain by gravity back to the Main Pump Station wetwell after an event.

For both alternatives, it is assumed that the tank or basin would be uncovered. A 24-inch diameter, 300-foot long forcemain would be required to route flows to equalization, and an 18-inch diameter, 300-foot-long gravity pipe would be needed to return flows to wetwell.

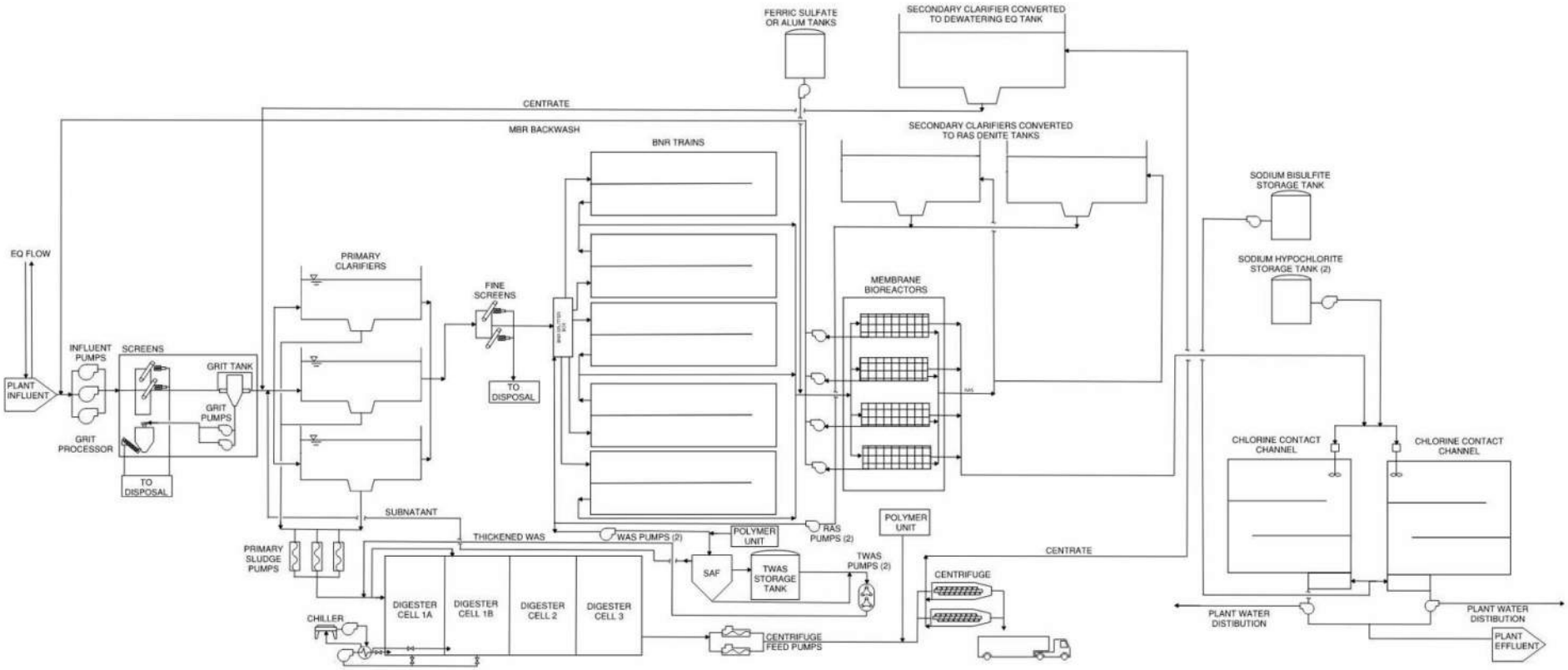


Figure 5-1. Proposed Flow Schematic

The costs for each alternative are shown in Table 5-1 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-1. Equalization BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alt 1A: Prestressed Concrete Tank	$3.32M	$118K	$3.44M
Alt 1B: Existing Basin with Lining	$2.86M	$118K	$2.98M

a. Cost are representative of 2022 dollars.

b. Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)

c. Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.

Alternative 1B – Existing Basin with Lining is recommended due to a lower NPV, utilization of the existing basin, and ease of maintenance. Additionally, this alternative will have less visibility to the public due to its lower profile.

5.1.2 Equalization (EQ) Pumping

Since flow equalization requires pumping, two alternatives for this pumping system were evaluated: a submersible pumping station and routing from Lift Station 1 (LS1).

Alternative 2A includes the construction of a 7.1 mgd submersible pump station to route flow to EQ while utilizing the existing main pump station to continue to pump flows to the plant. The submersible pump station would be constructed within the vicinity of the existing Main Pump Station and was assumed to be a triplex layout at an approximate depth of 30-feet. Alternative 2B involves routing flows from LS1 to flow equalization and eliminates the need for a dedicated EQ pump station. The approximate distance from LS1 to the plant is approximately 5,000 feet. Currently, there are modifications being planned for LS1 and design details would have to be coordinated with that project, such as implementing a valve vault to split flow between flow equalization and the main pump station as well as flow monitoring.

The costs for each alternative are shown in Table 5-2 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-2. Equalization Pumping BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alt 2A: 7.1 mgd Submersible Pump Station	$2.11M	$244K	$2.34M
Alt 2B: Route to EQ from LS1	TBD	TBD	TBD

a. Cost are representative of 2022 dollars.

b. Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)

c. Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.

Alternative 2B – Route EQ from LS1 is recommended due to the high cost of constructing a new EQ pump station. Improvements associated with this alternative, including a new valve vault and flow monitoring, would need to be coordinated with on-going work.

5.1.3 Main Pump Station

The existing Main Pump Station consists of a wetwell for receiving flow from the forcemain and a drywell with three influent pumps (two duty and one standby) with a nominal capacity of 4,800 gpm at 54 feet each. Two pumps running at full speed can deliver approximately 11 mgd. This exceeds the required influent pumping capacity of 9.5 mgd for the plant flow, and no additional influent pumping capacity is required. However, due to the poor access conditions for the existing wetwell, an alternative for wetwell improvements (Alternative 3A) was evaluated as well as an alternative to replace the Main Pump Station (Alternative 3B). Modifications for Alternative 3A included expanding the wetwell vault to the existing grade of 1393 feet and adding two access hatches to allow better access. The remainder of the Main Pump Station appears to be in good condition.

The costs for each alternative are shown in Table 5-3 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-3. Main Pump Station BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alt 3A: New Influent Pump Station	$18.5M	$860K	$19.3M
Alt 3B: Wetwell Improvements	$411K	$853K	$1.26M

a. *Cost are representative of 2022 dollars.*

b. *Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)*

c. *Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.*

Alternative 3B – Wetwell Improvements is recommended to provide better access to the wetwell. Based on cost, a new pump station is not recommended at this time.

5.1.4 Screening

Based on the recent condition assessment, Screen 2 requires replacement or refurbishment in the near future. This section evaluates the alternatives for replacement and/or refurbishment of this screen. The screening compactor is in good condition and does not require replacement at this time.

Two screen types were evaluated: perforated plate screens and multi-rake bar screens. Other types of screenings technology are available, but these represent the most common proven technologies that meet the desired design criteria. The existing screens are 3/8” diameter perforated plate-type.

Two alternatives were evaluated. Alternative 4A consists of the refurbishment or replacement of the existing second screen. For cost estimating purposes, the replacement of the screen with a perforated plate screen was assumed. This alternative would be implemented along with Grit Processing Alternative 5B described below. Alternative 4B incorporates the replacement of both existing screens. Either the perforated plate or multi-rake screen could be installed; the cost estimate assumed a perforated plate type screen. This alternative would be implemented along with Grit Processing Alternative 5A described below.

The costs for each alternative are shown in Table 5-4 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-4. Screening BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alt 4A: Replace One Screen	$653K	$469K	$1.12M
Alt 4B: Replace Both Screens	$1.57M	$484K	$2.05M

a. Cost are representative of 2022 dollars.

b. Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)

c. Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.

Alternative 4B – Replace Both Screens is recommended due to the age of the existing screens and to provide space for new grit processing equipment. It is recommended to install perforated plate screens to match the existing screens due to plant staff familiarity.

5.1.5 Grit Processing

Based on the condition assessment, the grit chamber and grit pumps are in good condition, but the grit piping, washer and classifier require replacement.

Four grit processing technologies were evaluated for grit processing:

- Grit cyclone/classifier-type (WEMCO Hydrogritter)
- Fluidized bed-type (Hydro GritCleanse)
- Lamella plate-type (Smith and Loveless)
- Fluidized bed-type (Huber Coanda RoSF4)

Other grit processing technologies are available, but these represent the most common proven technologies that meet the desired design criteria.

Two alternatives for grit processing were evaluated. Alternative 5A consists of moving the existing second screen to the third screen channel to make room for the grit processing equipment since the new grit equipment would be too large to fit the existing grit system footprint. This alternative would be implemented with Screening Alternative 3B described above since new screens would be provided and could be relocated at that time. This alternative includes removing the fill and concrete cap from the third screen channel and installing the second screen there to make room for the grit processing equipment.

Alternative 5B consists of expanding the Headworks Building to create additional room for the grit processing equipment. This alternative would be implemented with Screening Alternative 4A since only one screen would be replaced/refurbished and relocation of the screens would not be justified. In this alternative, the screens would remain in the existing locations and the building would be expanded to the south to allow for the new grit processing equipment and a dedicated grit dumpster area. National Fire Protection Association (NFPA) 820 considerations, including ventilation and explosion proof equipment, would be required for this building expansion.

The costs for each alternative are shown in Table 5-5 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-5. Grit Processing BCE Summary			
Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alt 5A: Relocate Screen Channel	$932K	$434K	$1.37M
Alt 5B: Expand Headworks Building	$1.79M	$434K	$2.23M

a. Cost are representative of 2022 dollars.

b. Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)

c. Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.

Alternative 5A – Relocate Screen Channel is recommended to utilize existing building space. The specific grit processing technology can be chosen during detailed design.

5.2 Liquid Treatments

5.2.1 Technology Screening

Twenty-five liquid stream technologies were reviewed for their ability to achieve the permitted monthly mass loads (Treatment Level 1) effluent criteria and then sequentially be expanded to meet future permit limits (Treatment Level 2) goals for potential future chloride requirements. Treatment Level 1 total phosphorus (TP) mass loading criteria is based upon the proposed annual limit in ALASD's existing National Pollutant Discharge Elimination system (NPDES) permit if Adaptive Lake Management Plan activities do not result in attaining water quality standards in Lake Winona. Table 5-6 below summarizes key effluent water quality criteria.

Table 5-6. ALASD Key Effluent Water Quality Criteria			
Treatment Level	Parameter	Averaging Period	Criteria
Level 1	Total Suspended Solids (TSS)	Monthly	339 kg/d <15 mg/L[a]
	Carbonaceous biological oxygen demand (cBOD5)	Monthly	282 kg/d <11 mg/L[a]
	Total Nitrogen (TN)	Monthly	8 mg TN/L
	Total Phosphorus (TP)	Annual Monthly	665 kg/yr 0.11 mg/L[a]
Level 2	Treatment Level 1 with Total Chlorides, mg/L	Daily Max	252 mg/L

a. Concentration of permitted monthly mass loading using the projected 2045 annual wet weather flow of 5.7 mgd.

b. Concentration of permitted annual mass loading using the projected 2045 annual average design flow of 4.3 mgd.

5.2.2 BioWin Modeling

Influent flows and loadings were summarized into an influent itinerary developed from historical operating data projected to Year 2045 that captured both maximum and average flows and loads at minimum, average, and maximum temperatures. The developed itinerary was input into BioWin to

define facility requirements for Treatment Levels 1 and 2. Several other updates to the existing model were incorporated, including influent wastewater characteristics, digester kinetics, primary clarifier TSS removal rates, ferric active site factors, and alkalinity dosage rates.

Several design parameters used in this analysis include process redundancy needs as all primary clarifiers, aeration basins, final clarifiers are in service during critical loadings period and tertiary filtration systems assume one filter train is out-of-service during peak flow conditions. Alternatives 2 and 3, the membrane bioreactor (MBR) alternatives, assume one BNR train and one membrane train are out of service during critical maximum month loading conditions. Additionally, BioWin default nitrification kinetics resulting in a design aerobic SRT of 9 days, Alternative 1 90th percentile design sludge volume index (SVI) value of 125 mL/g, and sludge thickening via suspend air flotation (SAF) or DAF followed by aerobic digestion and centrifuge dewatering were assumed.

5.2.3 Treatment Level 1 Alternatives

Based upon the technology screening process the following liquid stream treatment configurations were selected for further evaluation to meet Treatment Level 1.

5.2.3.1 Alternative 1: Conventional 5-stage BNR with continuous backwash deep bed filters

This alternative converts the existing activated sludge system with chemical phosphorus removal to a conventional 5-stage BNR system to biologically remove both nitrogen and phosphorus. A flow schematic is shown in Figure 5-2. A RAS denitrification zone is also provided to reduce the return nitrate load in the RAS stream to the anaerobic selector to maintain steady enhanced biological phosphorus removal (EBPR). Primary effluent is fed directly to the anaerobic zone except during wet weather flow when influent flows greater than 8 mgd are step fed directly to the latter half of the first aerobic zone. The internal recycle, or mixed liquor return (MLR) provides a source of nitrate for biological denitrification in the first anoxic zone. The second anoxic zone further reduces nitrate to achieve the target effluent water quality criteria. To consistently achieve effluent TP discharges less than 0.1 mg/L, new deep bed continuous backwash filters replace the existing cloth media filters. Ferrous sulfate is dosed at roughly 20 gpd for chemical phosphorus polishing as needed.

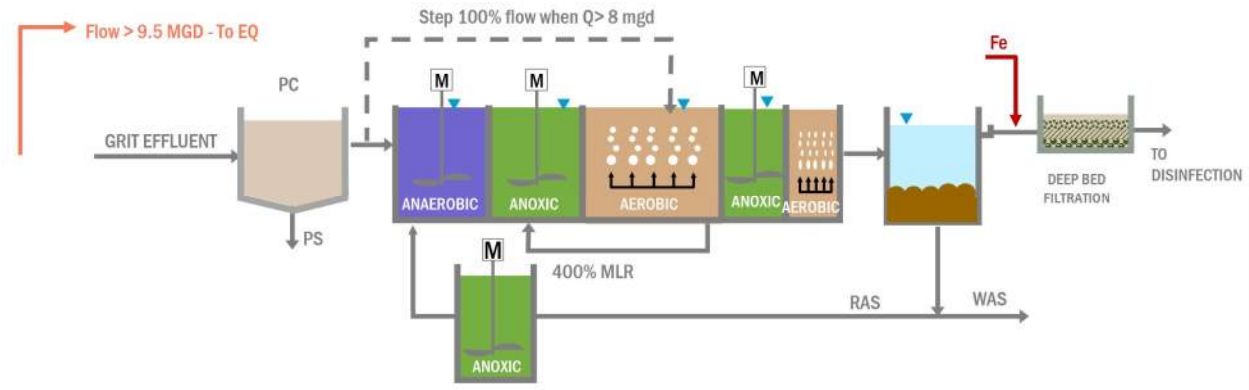


Figure 5-2. Alternative 1: 5-Stage BNR with RAS Denitrification

5.2.3.2 Alternative 2: Membrane Bioreactors (MBRs) with Primary Treatment

Alternative 2 is a 3-Stage BNR MBR system with a RAS deoxygenation/denitrification zone a shown in Figure 5-3. The MBR system replaces the secondary clarifiers and tertiary filters and operate by separating mixed liquor suspended solids (MLSS) with microfiltration membranes producing high quality effluent. Since membrane systems are not impacted by sludge settleability, the BNR system can operate at MLSS concentration of 2 to 2.5 times higher than conventional systems reducing the

tankage requirements. Daily diurnal flow equalization, as well as peak wet weather flow equalization, is recommended for MBRs to improve system operation and minimize capital costs. Additionally, 2-mm or 1-mm fine screens are required upstream of the BNR tanks to protect the membranes.

Metal salt such as ferrous sulfate, alum, or equal is dosed to the digesters to reduce phosphate returns in the dewatering centrate and to the liquid stream as needed for polishing. This analysis assumes ferrous sulfate is used for consistency with past operations and can be re-evaluated in detailed design. Carbon, such as Micro C or equal, addition to the RAS denitrification zones can be used to reduce nitrate in the anaerobic zone to maximize EBPR performance.

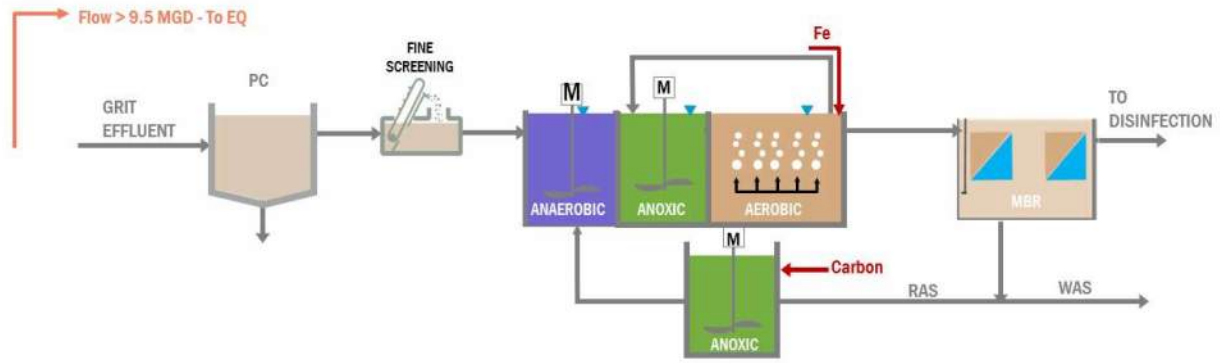


Figure 5-3. Alternative 2: MBR with Primary Treatment

5.2.3.3 Alternative 3: Membrane Bioreactors without Primary Treatment

Alternative 3 is essentially the same as Alternative 2 except it eliminates the primary clarifiers from service which requires the BNR train volumes to be much larger with a total of 5 trains at 0.57 MG each as shown in Figure 5-4. The secondary clarifiers and tertiary filters are again replaced with a MBR system. Again, metal salt is dosed to the digesters to control phosphorus in the centrate and carbon can be dosed to the RAS denitrification to remove nitrate. Flow equalization and fine screen would also be required as indicated previously.

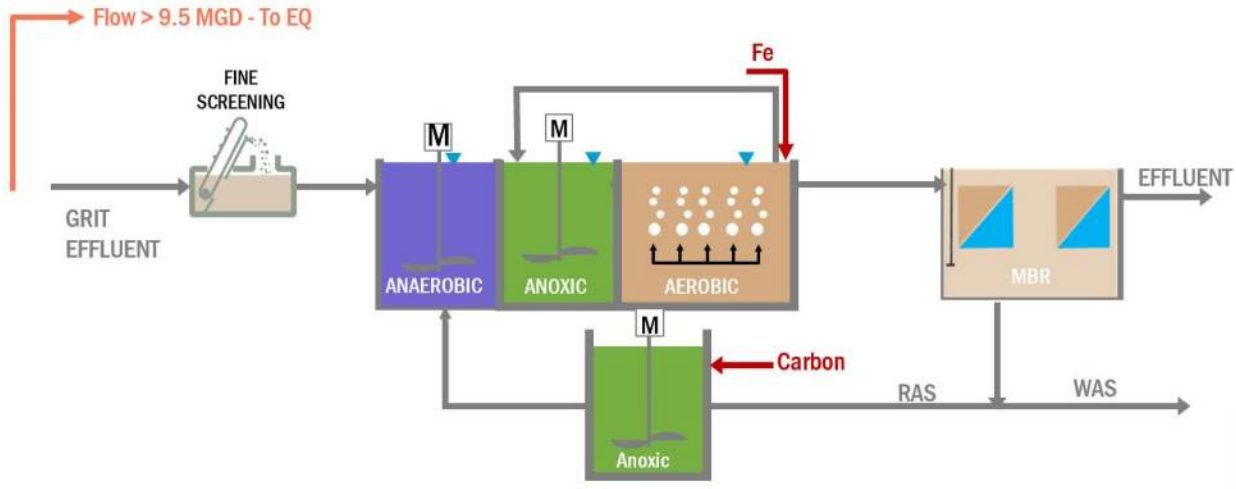


Figure 5-4. Alternative 3: 5-Stage BNR with RAS Denitrification and MBR

5.2.3.4 Treatment Level 1 Alternatives Comparison

Table 5-7 summarizes the comparative costs, facility requirements, and predicted effluent quality for each alternative. Capital costs for Treatment Level 1 Alternative 1 are 15 percent less than Alternatives 2 and 3 which are approximately equal. The net present value for Alternative 1 is 20 percent less than both Alternatives 2 and 3.

Table 5-7. ALASD WWTF Liquid Stream Alternative Evaluation Comparative Costs, Process Sizing, and Predicted Effluent Quality – Treatment Level 1

Item	Units	Alternative 1 5-stage BNR with filters	Alternative 2 MBRs with Primary Treatment	Alternative 3 MBRs without Primary Treatment
Capital Cost[a]	$ Millions	$46	$54	$54
Annual operating costs[a,b]	$ Millions	$0.18	$0.37	$0.40
Net Present Value[1]	$ Millions	$50	$59	$60
Process Tankage Summary				
Fine Screening (New)				
Type	--	--	1 mm	2 mm
Capacity	mgd	--	2 @ 9.0 mgd	2 @ 9.0 mgd
Primary Clarifiers	No.	3 @ 45' (1 new)	3 @ 45' (1 new)	--
BNR Basins				
Total Volume	MG	3.55 (1.71 new)	2.24 (0.76 new)	3.19 (1.71 new)
Aerobic/Total SRT	days	9/18.4	9/16.8	9/16.5
Step Feed, Q>8 MGD	Percent Total	100%	NA	NA
Mixed liquor recycle pumping	mgd	400%	250%	150%
BNR Solids Separation				
Type	--	Final Clarifiers	Membrane filtration	Membrane Filtration
Peak flow	mgd	10.2	9.5	9.5
Units	--	2 @ 45' 2 @ 75' (1 new)	4 trains with 7 cassettes (new)[c]	4 trains with 7 cassettes (new) [c]
RAS capacity-total	mgd	4.1	21	21
Deep Bed Filtration				
Type	--	Single stage deep-bed continuous backwash	--	--
Firm capacity	mgd	9.7	--	--
Ferrous sulfate dose	gpd	21	27	28
Predicted Effluent Quality				
Monthly Ammonia (Average/Max month)	mg-N/L	0.3/1.2	0.6/0.14	1.1/0.25
Monthly TP	mg-P/L	<0.09	<0.09	<0.09
Monthly TN	mg-N/L	6/5	5/6	6/7

a. Cost presented in 2022 dollars

b. Annual operation and maintenance in first year of operation – 2035

c. Based Upon SUEZ/Veolia ZeeWeed 500EV cassettes

5.2.3.5 Treatment Level 1 Sensitivity Analysis

A sensitivity analysis was performed on the Treatment Level 1 alternatives to evaluate the system requirements if the effluent TP monthly water quality criteria is reduced to 0.08 mg/L (mass loading limit at AWWF). The alternatives evaluated include Alternative 1A: Alternative 1 with 2-stage deep-bed continuous backwash filters, Alternative 2A: MBRs with primary treatment and Chemical phosphorus removal, and Alternative 2B: Alternative 2 with single stage continuous backwash filters. The major findings from this analysis include Alternative 1A capital costs and net present value (NPV) increase Alternative 1 costs by roughly $5 Million dollars, Alternative 2A using EBPR is at risk with the lower limits and may require the facility to convert to chemical phosphorus removal increasing NPV by $10 million, and Alternative 2B NPV is essentially the same as Alternative 2A. Overall, reducing TP discharges to 80 percent of the target effluent criteria (0.065 mg P/L) on a continuous basis presents a higher risk of permit non-compliance and near the edge of the best available of technology-based limits.

5.2.4 Treatment Level 2 Alternatives

Treatment Level 2 requirements were estimated for each of the Treatment Level 1 technologies (Conventional BNR with filtration and MBRs). The analysis assumes influent chloride concentrations are reduced by 40 percent through chloride reduction activities such as high efficiency softeners, Alexandria Light and Power City water softening, or equal. The alternatives evaluated are:

- Alternative 4: Alternative 1 with Microfiltration and Reverse Osmosis (MF/RO)
- Alternative 4A: Alternative 1 with Nanofiltration and Reverse Osmosis (NF/RO)
- Alternative 5: Alternative 2 with Reverse Osmosis (RO)

Alternative 4 adds conventional microfiltration followed by reverse Osmosis (MF/RO) after the tertiary continuous backwash filters for chloride reduction. Alternative 4A adds nanofiltration and reverse osmosis (NF/RO) to Alternatives 1's flow scheme. The advantage of this flow configuration is the divalent cations such as calcium and magnesium pass through the nanofiltration system resulting in lower loadings to the RO feed and downstream RO concentrate management system. Alternative 5 adds RO to an MBR BNR configuration. Each alternative assumes an RO concentrate management system consisting of an evaporator and crystallizer is used to remove excess water from the RO brine so the captured solids can be landfilled as non-hazardous waste.

Table 5-8 summarizes Treatment Level 2 comparative order-of-magnitude costs and general facility requirements. Capital costs and net present values for Alternatives 4A and 5 are within 15 percent and should be considered equal for this level of analysis. Table 1-3 also shows Alternatives 4A and 5 combined costs for Treatment Level 1 and 2 are also the same with Alternative 5 being simpler as it has less unit processes to operate.

Table 5-8. ALASD WWTF Liquid Stream Alternative Evaluation Comparative Costs and Process Sizing – Treatment Level 2

Item	Units	Alternative 4 Alternative 1 with MF/RO	Alternative 4A Alternative 1 with NF/RO	Alternative 5 Alternative 2 with RO
Order-of-Magnitude Capital Costs[a]				
Filtration	$ Millions	$11	$13	--
Reverse Osmosis	$ Millions	$15	$15	$15
Concentrate Management	$ Millions	$27	$21[c]	$27
Total	$ Millions	$53	$50	$42

Table 5-8. ALASD WWTF Liquid Stream Alternative Evaluation Comparative Costs and Process Sizing – Treatment Level 2				
Item	Units	Alternative 4 Alternative 1 with MF/RO	Alternative 4A Alternative 1 with NF/RO	Alternative 5 Alternative 2 with RO
Annual operating costs[b]				
Filtration	$ Millions	$1.2	$1.7	--
Reverse Osmosis	$ Millions	$2.4	$2.4	$2.4
Concentrate Management	$ Millions	$3.1	$1.5[c]	$3.1
Total	$ Millions	$6.7	$5.7	$5.5
Net Present Value[a]	$ Millions	$140	$123	$110
Microfiltration or Nanofiltration				
Number of trains	--	4	4	--
Capacity per train	mgd/train	1.1	1.1	--
Reverse Osmosis				
Number of trains	--	4	4	4
Capacity per train	mgd/train	1.0	1.0	1.0
Combined Treatment Level 1 and 2 Order-of-Magnitude Costs				
Capital Cost[a]	$ Millions	$100	$97	$96
Annual operating costs[a,b]	$ Millions	$6.9	$5.9	$6.0
Net Present Value[a]	$ Millions	$190	$173	$170

a. *Cost presented in 2022 dollars*

b. *Annual operation and maintenance in first year of operation - 2035*

c. *Capital costs based upon the following: Microfiltration cost of $2.6/gpd capacity, nanofiltration costs of $3/gpd capacity, reverse osmosis of $3.4/gpd capacity and RO concentrate management of $6.1/gpd capacity*

d. *Annual O&M costs based upon the following: Microfiltration cost of $0.0014/gallon treated, nanofiltration cost of $0.0020/gallon treated, reverse osmosis of $0.0027/gallon treated and RO concentrate management of $0.0035/gallon treated*

e. *NF/RO concentrate management capital costs of $4.9/gpd capacity and annual O&M of $0.0018/gal treated*

5.2.5 Recommendation

Based on the review of the treatment alternatives and costs, it is recommended that ALASD proceed with Alternative 2: MBR Filtration with Primary Treatment for Treatment Level 1 and Alternative 5: MBR with RO for Treatment Level 2. This pathway forward provides ALASD with the most robust treatment process which is critical given recent high industrial loadings have caused nitrification toxicity and poor sludge quality issues, provides excellent phosphorus removal to meet projected lower phosphorus discharge requirements, provides the most "phasable" approach to minimize near-term capital improvements, and supports the simplest and least expensive path forward to reduce chloride discharges using on-site treatment. The Liquids Stream Alternative Evaluation TM is located in Appendix H.

5.3 Solids Treatment

The solids processing systems consist of dissolved air flotation (DAF) thickening, aerobic digestion, and centrifuge dewatering. Additionally, there is a biosolids storage pad that stores dewatered sludge prior to land application. An alternative evaluation was conducted for each process. Liquids alternatives that were assumed for the purposes of this TM include Liquids Alternative 1 - 5-stage Biological Nutrient Removal (BNR), Liquids Alternative 2 - Membrane Bioreactor (MBR) with Primary Clarifiers, and Liquids Alternative 3 - MBR without Primary Clarifiers. Liquids Alternatives 1 and 2 have similar projected solids stream loadings for 2045 operations, while Liquids Alternative 3 has different projected values. The Solids Alternative Evaluation TM is located in Appendix I.

5.3.1 Thickening

Dissolved air flotation (DAF) is currently used to thicken waste activated sludge (WAS) prior to feeding to the aerobic digesters. The WAS must be thickened ahead of the aerobic digesters to provide adequate hydraulic retention time to achieve the required vector attraction reduction. However, oxygen transfer is hampered in the digesters when the sludge is too thick, which can cause upsets in the aerobic digestion process. The DAF and supporting equipment have been refurnished and upgrades have been made over the years to provide more consistent performance, better solids capture, and reduced underflow solids.

Two alternatives were evaluated for thickening. The first alternative would be to repurpose the DAF to a suspended air flotation (SAF) thickening process. The existing pressurization pumps, saturation tank, and air compressor would be removed and replaced with the serpentine flocculation unit and froth generator. The second alternative evaluated was to replace the DAF with membrane thickening. This thickening system would require a new building to house all of the equipment, including membrane trains, thickened sludge storage tank with aeration blowers, permeate pumps, drain pumps, and chemical cleaning systems.

The costs for each alternative are shown in Table 5-9 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-9. Thickening BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alternative 1A – SAF (Liquids Alt 1&2)	$0.63M	$1.3M	$1.9M
Alternative 1A – SAF (Liquids Alt 3)	$0.63M	$1.7M	$2.3M
Alternative 1B – Membrane Thickening (Liquids Alt 1& 2)	$6.3M	$1.5M	$7.8M
Alternative 1B – Membrane Thickening (Liquids Alt 3)	$6.5M	$1.5M	$8.0M

a. *Cost are representative of 2022 dollars.*

b. *Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)*

c. *Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.*

Alternative 1A – SAF is the recommended alternative due to the lowest life cycle cost and ability to repurpose the existing DAF.

5.3.2 Digestion

Aerobic digestion is used to treat a combination of primary and thickened waste activated sludge (TWAS) to reduce volatile solids and pathogens to Class B solids requirements. There are currently four digester cells containing fine bubble membrane diffusers for aeration and mixing. To keep the digesters below 30 degrees Celsius, a 100-ton chiller with two sludge-to-glycol heat exchangers are used to cool the sludge.

The existing digester cells require replacement of all the fine bubble diffusers and internal tank piping, and the chiller has reached the end of its useful life. A medium bubble diffuser system was considered as an alternative to the existing fine bubble system as these systems can accommodate thicker sludge, thereby reducing the digester volume required for treatment. However, since no further expansion of the digester volume is required for treatment (see paragraph below) and the air requirement for the medium bubble system is higher than the fine bubble system and exceeds the capacity of one existing blower, it was determined to not be cost effective. All digester alternatives assume a complete replacement of the fine bubble diffuser system and header piping for all four cells and the replacement of the buried air pipe from the blowers to headers.

The two digestion alternatives that were compared were digester operations for MBRs with and without primary clarifiers. The analysis for Liquids Alternatives 1 and 2 included replacing the existing chiller with a larger chiller unit, and Liquids Alternative 3 considered either replacing the existing chiller with the same size unit or changing the cooling technology to spiral heat exchangers (HEX) for use with either effluent water or city water for cooling.

The costs for each alternative are shown in Table5-10 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-10. Digestion BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alternative 2A – Replace 100-ton Chiller with 125-ton Chiller (Liquids Alt 1 & 2)	$2.0M	$2.1M	$4.2M
Alternative 2B – Replace 100-ton Chiller (Liquids Alt 3)	$1.9M	$2.1M	$4.0M
Alternative 2C – Replace Chiller with Spiral HEX using Effluent Water (Liquids Alt 3)	$1.6M	$2.1M	$3.8M
Alternative 2D - Replace Chiller with Spiral HEX using City Water (Liquids Alt 3)	$1.6M	$8.8M	$10.4M

a. Cost are representative of 2022 dollars.

b. Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)

c. Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.

While Alternative 2C has the lowest capital and NPV, this option is only applicable with Liquids Alternative 3 (without primary clarifiers) and was therefore not selected.

Alternative 2A – Replace 100-Ton Chiller with 125-Ton Chiller is the recommended alternative (based on the selection of Liquids Alternative 2). This recommendation includes a complete replacement of the fine bubble diffuser system and header piping for all four cells and the replacement of the buried air pipe from the blowers to headers.

5.3.3 Dewatering

The dewatering system consists of a single Alfa-Laval centrifuge, which is located on the second level of the Solids Handling Building and was installed in 2008. The centrifuge is operated four to five days per week for a 6-to-8-hour shift per day. Since there is only one centrifuge, a redundant centrifuge is recommended to provide better operation reliability.

Two alternatives were evaluated for dewatering. The first alternative continues to utilize the existing centrifuge but adds a second centrifuge for redundancy. The second alternative replaces the centrifuge with screw press technology. Both alternatives assume that an addition would be required to the Solids Handling Building to house the new equipment.

The costs for each alternative are shown in Table 5-11 and include capital cost, O&M costs, and total net present value (NPV).

Table 5-11. Dewatering BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Alternative 3A – Centrifuge (Liquids Alt 1&2)	$4.3M	$5.0M	$9.3M
Alternative 3A – Centrifuge (Liquids Alt 3)	$4.3M	$5.5M	$9.8M
Alternative 3B – Screw Press (Liquids Alt 1&2)	$5.8M	$5.0M	$10.8M
Alternative 3B – Screw Press (Liquids Alt 3)	$5.8M	$5.5M	$11.3M

a. *Cost are representative of 2022 dollars.*

b. *Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)*

c. *Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.*

Alternative 3A – Centrifuge is the recommended alternative due to the lowest life cycle cost, higher solids capture, and operator familiarity with the technology.

5.3.4 Biosolids Storage Pad

ALASD operates the centrifuge 4 to 5 days per week for roughly 6 hours per day and generates 2 to 3 truckloads of cake per day. The cake generated at ALASD is land applied on a select number of farm fields. Cake is either hauled out to the fields directly, hauled to storage located at the fields, or stored on the biosolids storage pad located at the WWTF, depending on the time of year.

The existing biosolids storage pad is approximately 200 feet by 220 feet (44,000 square feet). The recommended biosolids storage area size is 30,000 square feet based on projected biosolids production and a maximum six-month storage period. The excess area is currently being used for other purposes including chemical tank storage and drying solids from vacuum truck sludge following pump station cleaning.

The biosolids storage pad consists of bituminous pavement surfacing and perimeter bituminous curb and wood barrier. The bituminous pavement surfacing is estimated to be at least 20 years old and has deteriorated to a condition that a simple bituminous pavement overlay is no longer feasible. The perimeter bituminous curb and wood barrier are also deteriorated and provide little containment function. Alternatives were evaluated to reclaim the existing biosolids or move the biosolids storage

pad to a new location to be closer to the dewatering process. Additionally, the option of adding a partial fabric or steel cover was also evaluated to provide drying flexibility.

The costs for each alternative are shown in Table 5-12 and include capital cost and total NPV (including equipment replacement cost and salvage values). O&M costs were not included since they were assumed to be the same for each alternative and operating costs are not applicable.

Table 5-12. Biosolids Storage Pad BCE Summary

Alternative	Capital Cost	Miscellaneous Storage Area Cost	Total Capital Cost
Alternative 4A - Reclaim Existing Biosolids Storage Pad	$0.2M	$0.1M	$0.3M
Alternative 4A.1 - Reclaim Existing Biosolids Storage Pad + Partial Fabric Cover	$0.7M	$0.1M	$0.8M
Alternative 4A.2 - Reclaim Existing Biosolids Storage Pad + Partial Steel Cover	$0.9M	$0.1M	$1.0M
Alternative 4B - New Biosolids Storage Pad Closer to WWTF	$0.3M	$0.1M	$0.4M
Alternative 4B.1 - New Biosolids Storage Pad Closer to WWTF + Partial Fabric Cover	$0.9M	$0.1M	$1.0M
Alternative 4B.2 - New Biosolids Storage Pad Closer to WWTF + Partial Steel Cover	$1.0M	$0.1M	$1.1M

a. *Cost are representative of 2022 dollars.*

Alternative 4A.1 – Reclaim Existing Biosolids Storage Pad and Construct Partial Fabric Cover is the recommended alternative. This alternative is less costly than constructing a pad in a new location and the added cover will provide flexibility for biosolids drying. This alternative also keeps the pad in an inconspicuous location that does not draw public attention.

5.4 Disinfection

The existing gaseous chlorine disinfection equipment at the ALASD WWTF is beyond its useful life and in need of replacement.

Due to health and safety concerns, a chlorine gas system was eliminated as a future alternative.

The four disinfection alternatives that were compared were:

- sodium hypochlorite/sodium bisulfite
- open-channel ultraviolet light (UV) disinfection
- closed vessel UV disinfection
- peracetic acid (PAA)

The sodium hypochlorite alternative includes the addition of bulk storage tanks and peristaltic metering pumps for sodium hypochlorite as well as new sodium bisulfite equipment for dechlorination. The existing chlorine contact channel could continue to be used for this alternative.

The open-channel UV disinfection alternative has two possible configurations. Alternative 2A consists of retrofitting an open-channel UV system into the existing chlorine contact basins. Only one manufacturer (Trojan) can provide equipment to fit into the existing channels. Alternative 2B consists of constructing a new UV channel and could include several different suppliers of UV equipment.

The closed vessel UV disinfection alternative consists of pressurized vessels that contains UV lamps. Either two or three vessels would be required depending on the manufacturer.

Evaluation of peracetic acid (PAA) as an alternative disinfectant to chlorine could potentially provide a more cost-effective alternative to chlorine or UV disinfection. Currently, no facility in the state using it was identified, so ALASD would need to work with the MPCA to negotiate permitting requirements if switching to PAA. Generally, the PAA residual in the effluent must be low enough to not be toxic or harmful to humans, animals, plants, or aquatic life. To pursue PAA as a disinfection alternative, bench-testing is recommended to verify the contact time and dosage amounts needed to meet the treatment goal and toxicity testing to confirm a PAA residual would not elevate aquatic life toxicity from the final effluent. Pilot testing would likely be required by MPCA to confirm adequate treatment is achieved and confirm permit requirements can be met. Due to these reasons, PAA was not fully evaluated for ALASD at this time, but additional background and pilot testing information is provided below if this alternative is pursued in the future.

The costs for each alternative are shown in Table 5-13 and include capital cost, O&M costs, and total net present value (NPV). The NPV for all of the alternatives are within 10 percent of each other. The recommended alternative will be based on the liquid treatment alternative that is selected and whether disinfection will be required by the MPCA. If disinfection is required, UV disinfection appears to be more favorable since no chemical handling will be required. However, with a MBR system, disinfection may not be required. MBR systems typically discharge zero fecal counts so disinfection is not usually necessary; however. backup facilities would be in place if needed. If only a back-up disinfection system is required, a sodium hypochlorite system would be recommended since this chemical is already required for MBR cleaning and could serve a dual purpose for disinfection, if needed. Selection of the sodium hypochlorite alternative also provides the most energy efficient alternative for disinfection. Furthermore it is anticipated the MBR treatment performance will be able to reduce the need for chemical usage which will significantly lower the anticipated O&M costs for this alternative.

Table 5-13. Disinfection BCE Summary

Alternative	Capital Costs[a]	O & M Costs[b]	Total NPV with Adjustment[c]
Sodium Hypochlorite[d]	$622K	$1.7M	$2.4M
UV (Retrofit)	$1.7M	$800K	$2.5M
UV (New Channel)	$2.1M	$800K	$2.9M
UV (Closed Vessel)	$1.8M	$760K	$2.6M

a. *Costs are representative of 2022 dollars.*

b. *Total O&M costs for the Year 2045 Planning Period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs).*

c. *Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.*

d. *PAA will be evaluated during design as a potential alternative for disinfection backup in lieu of sodium hypochlorite.*

The Disinfection Alternative Evaluation TM is located in Appendix J.

5.5 Additional/Support Systems

5.5.1 Back-up Power

The WWTF is supplied by two electrical feeds from Alexandria Light and Power (ALP), which meets the redundancy requirement for emergency power. Additionally, back-up power is provide by two diesel-powered generators, one rated at 400 kW (installed in 1976) and the other at 300 kW (installed in 2008).

A new 200 kW generator is included in the Liquids Treatment Alternatives 2 and 3 for the MBR facility.

5.5.2 City Water/Plant Water

Plant water is supplied by two variable speed, vertical turbine pumps that are installed in the last pass of the chlorine contact tank to convey plant effluent to the plant water distribution system, which supplies water for multiple in-plant uses, including washdown and seal water. The plant water pumps are recommended to be replaced due to corrosion issues.

The WWTF is connected to city water which serves the administration building, vehicle maintenance building, and laboratory.

5.5.3 HVAC, Electrical, and I&C

HVAC, electrical, and I&C improvements associated with the process recommendations described above have been accounted for in the capital and NPV cost estimates. An extensive evaluation of additional HVAC and electrical and I&C improvements was not included as part of this Facility Plan.

5.5.4 Energy Conservation and Renewable Energy Opportunities

Energy assessments for the electrical use for each alternative considered were completed as part of this facility plan process and are included in the technical memorandums in the appendices. Further energy efficiency evaluations will be completed during design and equipment selection as well. While the selected alternative for the liquid phase treatment was not the most energy efficient, the recommended alternative offered non-monetary benefits including reliability and resiliency in meeting future effluent limits. The selected disinfection system provides the most energy efficient alternative for this unit process.

Renewable energy opportunities at the WWTF were evaluated as part of a prior study (November 2013 ALASD Wastewater Feasibility Study). The potential feasibility of wind and solar generation systems to offset ALASD's WWTF electrical consumption were evaluated. The economic payback of the solar systems evaluated was 44 years, while the payback on the wind system was 25 years. ALASD's WWTF is located next to the Alexandria Municipal Airport, making wind options less viable as they would require extensive Federal Aviation Association (FAA) evaluation and approvals to ensure the wind system would not interfere with airport navigation.

5.5.5 Reuse/Water Conservation

Based on the selected MBR treatment options, future water reuse options will be considered both onsite and off-site. Onsite options will be incorporated into the design of the WWTF improvements including plant water systems, on-site irrigation, as well as a water fill station for contractor use or public utility uses such as street sweeping. With the high-quality effluent from the MBR alternative, offsite industrial water reuse options could become available as additional industrial development occurs near the WWTF site. There are also existing industries located within a one-mile radius that could explore water reuse options from the MBR facility.

Plant effluent water uses will be further explored during the design phase to decrease city water use. Multiple processes such as wash water for screening or centrifuge cleaning and seal water are candidates for use of plant effluent water. ALASD also encourages water conservation for industrial users. With hydraulic constraints at the WWTF, industries have looked for ways to reduce their water usage to reduce their wastewater flow discharge quantities resulting in lower fees.

As part of the MPCA cost and effectiveness criteria, water conservation must be considered. ALASD provides sanitary sewer services only and does not provide public water supply service. Alexandria Power and Light (ALP) operates the public water supply system in the City of Alexandria. ALASD users in townships rely on private wells for their water supply. The City of Alexandria, ALP, and ALASD work collaboratively on multiple issues to ensure cost effective solutions and conservation measures are being practiced. ALP has the following programs in place for water conservation:

1) ALP Utilities 2018 Water Supply Plan outlines water conservation and resource sustainability measures for the City of Alexandria public water supply. Based on this plan, ALP has initiated programs over the past decade to provide water conservation education and provided rebates or retrofit programs for water efficient appliances. This plan is available upon request through ALP and is on file at ALASD offices.
2) ALP in the in the process of replacing all water meters in the system starting in 2022. This improvement project is expected to be completed within the next 2 to 3 years depending on availability of water meters from manufacturers. Accurate water meters will ensure that both residential and commercial customers have access to accurate water records to track and address potential leaks to reduce water losses.
3) ALP conducts an annual system water audit to meet Minnesota Department of Health requirements to reduce water losses within the ALP water distribution system.
4) ALP's rate structure includes a conservation rate structure for summer months to encourage water conservation during the summer months which are the highest water use periods. This allows ALP to minimize the summer water demand which helps conserve water, reduce the capital expenditures and natural resources which would be needed to expand capacity to meet high summer water demand.

5.5.6 Green Infrastructure, Sustainability and Climate Resiliency

As part of the MPCA cost and effectiveness criteria, green infrastructure, sustainability, and climate resiliency are to be documented, if applicable. Green infrastructure components have not been explored as part of the facility plan. However, it should be noted that the proposed improvements related to peak weather flows and proposed EQ provide a resilient, sustainable, and cost-effective alternative to handle more intensive rain events by incorporating an EQ storage basin which significantly reduces costs, materials and resources needed to expand the WWTF unit processes to handle these peak hourly flows. The headworks and EQ improvements are discussed in Section 5.

Section 6

Hydraulic Profile

6.1 Hydraulic Analysis

The hydraulic profile for ALASD was created using the Visual Hydraulics software to determine water surface levels through each plant process and headloss associated with treatment systems and piping. The model was split into two sections; Plant effluent to the filter effluent, and from the filter influent to the 6mm screen influent channel. Two process configurations were run for the model at a design flow of 9.5 mgd; MBR with primary clarifiers and MBR without primary clarifiers. Both process configurations consist of two 2mm fine screens, two BNR tanks, and the MBR system in addition to the existing treatment systems. Each alternative assumes a 21 mgd RAS return flow to the anaerobic zone of the BNR tanks and an internal recirculation flow of 21 mgd to the anoxic zones of the BNR tanks.

6.1.1 MBR with Primary Clarifiers

For this alternative, a third 45-foot primary clarifier was added to the model. The MBR system was assumed to be at an invert elevation of 1390.00 and an effluent weir was added to the MBR system to set the hydraulic grade line at 1401.74. When the model was left as is, the BNR tanks were in a submerged state and were overflowing due to the headloss associated with the fine screens. This issue was solved by reducing the three existing BNR effluent weirs from the invert elevation of 1403.17 to 1402.17. The two new BNR train effluent weirs were assumed to have an invert of 1402.17. The fifth BNR train was assumed to be out of service. Figure 6-1 dhows the hydraulic model results.

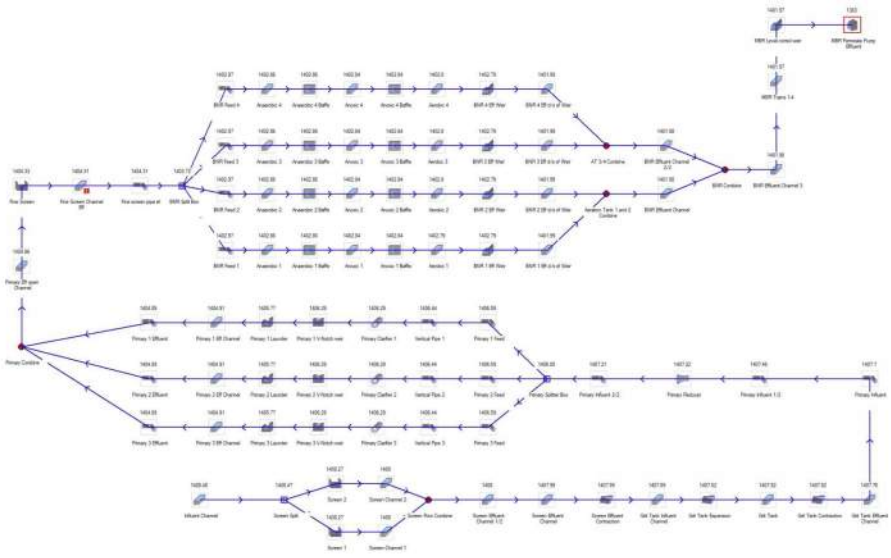


Figure 6-1. MBR w/ Primary Clarifiers Hydraulic Model

6.1.2 MBR without Primary Clarifiers

This process configuration assumed both existing primary clarifiers to be removed from the profile and was able to operate under normal conditions without any further modifications to the model.

Section 7

Implementation Plan

Based on the review of the treatment alternatives, operability and reliability considerations, costs, and non-monetary factors, the recommended liquid treatment alternative is MBR Filtration with Primary Treatment and Biological Phosphorus Removal. Similarly, the recommended improvements for all unit processes is listed in this section along with costs, non-monetary considerations, and schedule. Detail on each unit process alternative recommendation was provided in Section 5 and in the respective TM in the appendices.

7.1 Recommended Plan

The recommended plan includes the following improvements to meet Year 2045 flow and loading projections:

- EQ Storage – Line portion of existing storage basin for peak wet weather events
- EQ Pumping – Route EQ from LS1 (may be included in current project)
- Main Pump Station – Wetwell improvements
- Influent Screening – Replace both screens with new perforated plate screens and relocate one in the third screening channel to make space for new grit processing equipment
- Grit Processing – Replace grit processing equipment
- Liquids Treatment – MBR filtration with primary treatment and biological phosphorus removal
- Thickening – Convert DAF to SAF
- Digestion – Replace chiller with larger unit and replace fine bubble diffuser system and header aeration piping
- Dewatering – Install second/redundant centrifuge
- Biosolids Storage Pad – Reclaim existing bituminous and provide partial fabric cover
- Disinfection – Provide sodium hypochlorite/sodium bisulfite back-up system, if approved by MPCA. Alternatively, a UV disinfection system will be installed if fulltime disinfection is required.

Due to the higher effluent quality that will be achieved with the recommended upgrades, the name of the facility will be updated to the ALASD Water Reclamation Facility (WRF).

7.2 Costs

The capital costs, O&M costs and NPV for the recommended improvements are summarized in Table 7-1.

Table 7-1. Summary of Capital Costs

Description	Capital Costs[a]	O&M Costs[b]	Total NPV with Adjustment[c]
EQ Storage	$2.86M	$0.1M	$3.0M
EQ Pumping	-	-	-
Main Pump Station	$0.41M	$0.9M	$1.3M
Screening	$1.57M	$0.5M	$2.1M
Grit Processing	$0.93M	$0.4M	$1.4M
Liquids Treatment	$53.4M	$5.7M	$59.1M
Thickening	$0.63M	$1.3M	$1.9M
Digestion	$2.00M	$2.1M	$4.2M
Dewatering	$4.28M	$5.0M	$9.3M
Biosolids Storage Pad	$0.70M	-	$1.0M
Disinfection	$0.62M	$1.7M	$2.4M
TOTAL	$67.4M	$17.7M	$85.7M

a. *Costs are representative of 2022 dollars.*

b. *Total O&M costs for the Year 2045 planning period. Annual O&M costs are reflected in the detailed Business Case Evaluations (BCEs)*

c. *Equipment replacement costs and salvage values are included in the total NPV and are reflected in the detailed BCEs.*

7.3 Non-Monetary Considerations

In addition to the cost analysis performed in the BCEs, non-monetary considerations were factored into the recommended improvements. These factors included reliability, water quality, resiliency, constructability, expandability, ease of operations and maintenance, and energy usage.

The recommended MBR alternative provides ALASD with:

- The most robust and resilient treatment process which is critical given recent high industrial loadings have caused nitrification toxicity and poor sludge quality issues,
- Reliable and excellent phosphorus removal capability to meet projected lower phosphorus discharge requirements and highest effluent quality,
- The most “phasable“ approach to minimize near-term capital improvements, and
- Supports the simplest and least expensive path forward to reduce chloride discharges using future on-site RO treatment combined with ALASD’s current source reduction measures. (Note - ALASD will not be able to meet full chloride reductions through source reduction only and will need to treat a portion of flow with RO to meet future final limit if variance is not extended in future years.)

7.4 Layout

The plant layout showing the recommended improvements is shown in Figure 7-1. The improvements will all be located on the existing WWTF site, with the exception of a new forcemain from LS-1 to the WWTF as shown in Figure 7-2. The construction will be sequenced to allow for continuous treatment of the flow to meet permit requirements during construction.

Figure 7-1. Proposed Plant Layout

Figure 7-2. Proposed Forcemain from LS-1 to the WWTF EQ Basin for Peak Flows

7.5 Phasing Options

As shown in Table 7-2, several of the recommended improvements are able to be deferred if adequate funding isn't available.

Table 7-2. Potential Deferred Capital Improvements and Costs

Process Area	Potential to Defer
Liquids treatment- alternative 2 (MBR with primary clarifiers) redundant units to 2035	$5.3M (1 tank and 1 blower)
Influent Pump Station- Wetwell improvements optional	$0.41M
Biosolids Pad- Reclaim existing pad and install partial fabric cover	$0.79M
Solids Processing- Install redundant centrifuge/expand or new solids building	$4.28M
Thickening Convert- DAF to SAF	$0.63M

The MBR tank and blower shown above would still be required for 2045 capacity for redundancy/reliability purposes, however could be deferred to 2035. The influent lift station wetwell improvements are optional, but recommended. A redundant centrifuge is recommended for operational reliability, however could also be deferred. In addition, options to reduce the additional building costs to house the redundant centrifuge can be further explored during design. Conversion of the DAF to SAF is recommended for 2045 conditions, however could be deferred to 2035. The biosolids storage improvements could be completed as a separate project in the future or delayed to 2035.

7.6 Schedule

A planning level schedule is shown in Figure 7-3. Construction will be sequenced to allow for continuous treatment of the flow to meet permit requirements during construction. This proposed schedule meets the NPDES compliance schedule to meet reduced total phosphorus limits which requires completion of construction by March 30, 2030.

Figure 7-3. Planning Level Schedule for Improvements

Section 8

Funding and Rate Impacts

8.1 Potential Funding Sources

This section reviews various funding options, affordability, and impact on future user rates.

8.1.1 Minnesota Public Facilities Authority

The Minnesota Public Facilities Authority (PFA) is responsible for financial management of the Clean Water Revolving Fund (CWRF) program and makes funding awards to eligible projects. CWRF is also commonly referred to as the State Revolving Fund (SRF). Each year the PFA prepares an Intended Use Plan (IUP) that lists the projects eligible to apply for loans. Wastewater projects seeking CWRF loans must be listed on the Minnesota Pollution Control Agency's (MPCA) Project Priority List to be eligible for placement on the IUP, and construction projects must have an approved facility plan.

8.1.2 Clean Water Revolving Loan Fund (CWRF)

The CWRF is supported by a combination of federal and state funding and revolving loan repayments. In addition to regular funding, the 2023 IUPs will also include additional federal funding from the Infrastructure Investment and Jobs Act (IIJA) for low interest loans and principal forgiveness grants based on state affordability criteria and for green infrastructure. IIJA was renamed as Bipartisan Infrastructure Law (BIL).

Request for Placement on 2023 PPL was completed on March 4, 2022. Review and update to the PPL scoring worksheet should be completed based on recently completed facility plan information, specifically regarding facility capacity.

Wastewater Facilities Plans are due to the MPCA March 4, 2023. Request for Placement on the 2023 IUP is due to the PFA June 3, 2023.

8.1.3 Water Infrastructure Funding (WIF) Grant

The WIF project information worksheet was submitted to the Minnesota PFA on December 28, 2022, to determine eligibility for grant funds based on affordability criteria. Eligibility and availability of funds is yet to be determined.

WIF grants may be available if the average per household costs exceeds the affordability criteria of 1.4% of median household income. Douglas County median household income for 2019 was $63,819 and the City of Alexandria median household income for 2019 was $55,426. This equates to a monthly cost of $74.46/month and $64.66/month, respectively. ALASD's current residential monthly user rates are $37.10 plus the additional cost received from local government property taxes which is approximately $10/month. ALASD conducted a cost of service rate study in 2021 which recommended rate increases of 12% for 3 years, and subsequent 7% increases for another three years to accommodate needed improvements at the WWTF.

8.1.4 Point Source Implementation Grant (PSIG)

ALASD will be applying for PSIG grant based on more stringent total phosphorus limits. Applications are accepted in July of each year. The Point Source Implementation Grant (PSIG) program provides grants to local governments to upgrade water treatment facilities to meet more protective requirements to improve water quality. Eligible project costs are those necessary to meet wasteload reduction requirements under Total Maximum Daily Load (TMDL) implementation plans, to reduce the discharge of phosphorus or meet other water quality-based effluent limits, or to meet a total nitrogen concentration or mass limit that requires a discharge of ten milligrams per liter or less. The PSIG program provides grants for 80% of eligible costs up to a maximum of $7,000,000.

This program is jointly administered by the PFA and the Minnesota Pollution Control Agency (MPCA). Eligible projects must be ranked on the MPCA's Project Priority List (PPL). Cities and other local governments that expect to have a PSIG eligible project ready for construction start in the spring/summer should submit a PSIG grant application during July of the prior year. PSIG funding for new projects is dependent upon future budget and bonding appropriations.

8.1.5 Green Project Reserve (GPR)

The PFA encourages clean water projects that improve water efficiency, energy efficiency, or mitigate stormwater runoff (Green Project Reserve – GPR). ALASD is currently evaluating recommendations to determine eligibility for GPR funds for Disinfection System Improvements and other selected processes based on BCE evaluations conducted as part of this facility plan.

8.1.6 Rate Impacts

Current operations and maintenance costs are expected to increase with inflationary pressures; however, the proposed improvements are expected to have minimal net impact on the annual operations and maintenance expenses. In contrast, the annual debt payments for proposed improvements will increase (i.e., approximately double in total annual payment) due to the proposed project even with taking into account loan retirements for past projects. The annual current debt for 2008 WWTF project is scheduled to be retired in 2028 and debt for the 2016 WWTF project is significantly reduced starting in 2028. Future debt for the proposed improvements would begin in 2028 or 2029. Rate increases are anticipated as a result of the additional debt payments required for the recommended improvements.

City of Alexandria median household income for 2019 was $55,426* and Douglas County median household income for 2019 was $63,819. Using the MPCA's 1.4% affordability criteria, this equates to an annual cost of $776 to $894 per household (i.e. monthly cost of $64.66/month and $74.46/month), respectively. More than one-half of ALASD users are located in the City of Alexandria which includes economically disadvantaged areas (i.e., see Section 8.1.7.) *Furthermore. the majority of growth is occurring in the City of Alexandria and in particular multifamily residential. Therefore, it is recommended to use the City of Alexandria median household income for considerations for project funding calculations.

ALASD's current residential monthly user rates are $37.10 and does not include additional revenue received from the local government property tax allocation which is collected from the cities and townships through property tax revenue. The average allocation calculated from the total tax revenue divided by the number of users would equate to an additional $10/month/connection. ALASD conducted a cost-of-service rate study in 2021 which recommended rate increases of 12% for 3 years, and subsequent 7% increases for another three years to accommodate needed improvements at the WWTF. Resulting rates plus the additional $10/month/household from local

government property tax allocation would exceed the affordability criteria for the City of Alexandria median household income.

Multifamily housing demands are increasing in the City of Alexandria and represent a significant growth component to ALASD's future capacity needs. In addition, portions of the City of Alexandria are delineated as economically disadvantaged which increases the affordability concerns.

8.1.7 Environmental Justice Issues

The WWTF is located in an industrial zoned area away from residential development or existing homes. The most significant adverse impacts are likely due to rate increases from the improvement project. Figure 8-1 presents the designated environmental justice area surrounding ALASD.

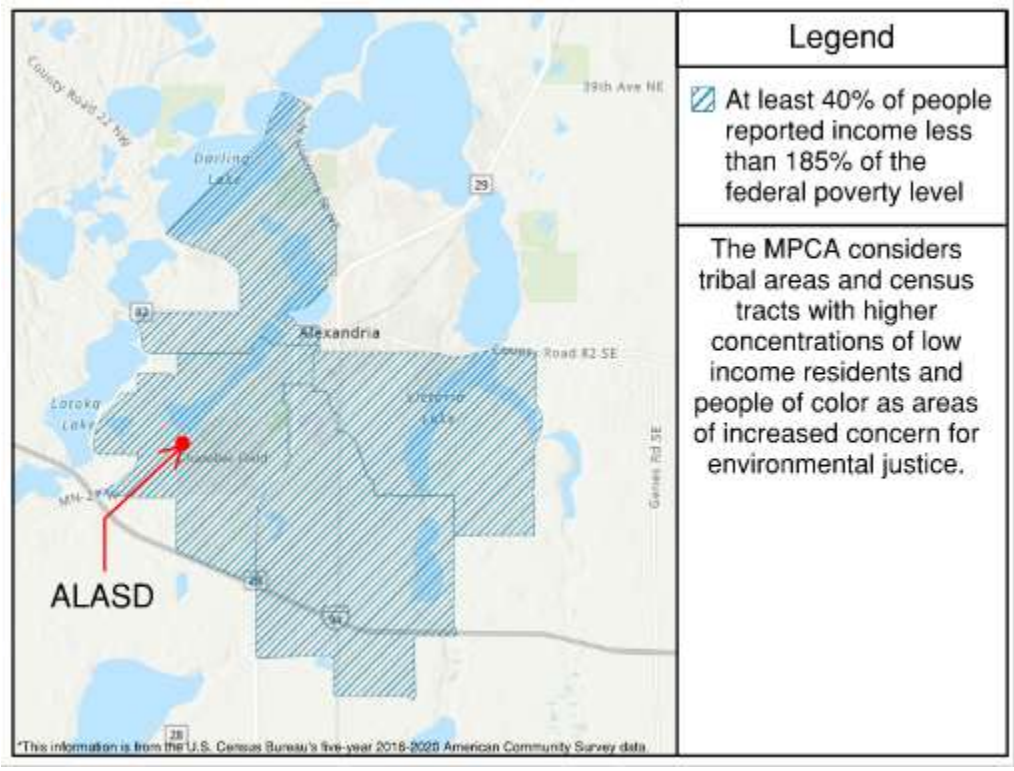


Figure 8-1. MPCA Environmental Justice Map

Multifamily housing demands are increasing in the City of Alexandria and represent a significant growth component to ALASD's future capacity needs. In addition, portions of the City of Alexandria are delineated as economically disadvantaged which increases the affordability concerns.

Section 9

Limitations

This document was prepared solely for ALASD in accordance with professional standards at the time the services were performed and in accordance with the contract between ALASD and Brown and Caldwell dated May 4, 2022. This document is governed by the specific scope of work authorized by ALASD; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by ALASSD and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 10

References

Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (GLUMRB). 2014. *Recommended Standards for Wastewater Facilities.* Health Research Inc, http://10statesstandards.com/wastewaterstandards.pdf

Hazen and Sawyer. 2021. *Comprehensive Wastewater Services Plan*, prepared for ALASD.

Appendix A: Environmental Information Worksheet

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Environmental Information Worksheet (EIW) form

Clean Water State Revolving Fund Program

Minnesota Rule Chapter 7077.0272, subp. 2.a.F.
Minnesota Rule Chapter 7077.0277, subp. 3.E.

Doc Type: Wastewater Point Source

Eligible applicants seeking funds for clean water (stormwater and wastewater) projects through the Clean Water State Revolving Fund (commonly referred to as the CWSRF Program) are required by Minn. R. ch. 7077.0272, subp. 2.a. F. and Minn. R. ch. 7077.0277, subp. 3.E., to complete an Environmental Information Worksheet (EIW). This information will be used to assess environmental impacts, if any, caused by the project.

Questions: Contact Review Engineer or Bill Dunn at 651-757-2324 or bill.dunn@state.mn.us.

1. Project title: Alexandria Lake Area Sanitary District (ALASD) Water Reclamation Facility Project

2. Proposer: ALASD

Contact person: Scott Gilbertson

Title: Executive Director

Address: 2201 Nevada Street SW

Alexandria, MN 56308

Phone: 320-762-1135

Fax:

3. Project location: County: Douglas City/Twp: Alexandria

NE 1/4 SW 1/4 Section: 25 Township: T128N Range: R38W

Tables, Figures, and Appendices attached to the EIW:

- County map showing the general location of the project;
- United States Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
- Site plan showing all significant project and natural features.

4. Description:

a. Provide a project summary of 50 words or less.

The Alexandria Lake Area Sanitary District (ALASD) is proposing improvements to the existing wastewater treatment facility to meet more stringent limits, expand capacity due to the projected flow and load increase for 2045, and replaced equipment and components that are beyond their useful life expectancy.

The proposed project compenents/improvements are described below in item 4b.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Existing Facility

The ALASD was organized in 1971 and the WWTF has been in operation since 1977. ALASD treats wastewater conveyed from the city of Alexandria, eight local townships plus additiona contract cities/users and covers a service area of approximately 100 square miles (see Figure 3 for ALASD Sewer District Boundary). ALASD was expanded in 2006 to increase plant capacity to 4.7 mgd average wet weather design flow (AWWDF) and replace equipment.

The ALASD WWTF liquid stream process consists of influent pumping, screening, grit removal and processing, two 45-foot circular primary clarifiers, two-pass activated sludge aeration basins, two 55-foot secondary clarifiers, one 75-foot secondary

clarifier, cloth disk filtration, and gaseous chlorine disinfection. Chlorinated effluent is then dechlorinated prior to discharge into Lake Winona. Phosphorus removal is accomplished with ferrous sulfate dosing in the secondary treatment process and and tertiary cloth disk filters. Primary solids are thickened in the primary clarifiers while waste activated sludge (WAS) is thickened by a dissolved air flotation (DAF) thickener prior to feeding the aerobic digestion system. Digester effluent is dewatered with a centrifuge for land application and centrate is routed to primary clarifier effluent (see Figure 4 for the existing ALASD site layout).

Proposed Project

The facility will be expanded to increase the AWWDF to 5.7 mgd and will include upgrades to address more stringent nutrient limits and rehabilitation of aging equipment and structures. Construction of the project will remain within the existing facility boundary with exception to the equalization basin piping routed from Lift Station 1 (LS1) to the Northeast of the existing Facility site. ALASD will maintain the existing discharge location into Lake Winona and remain a Class A treatment facility. Construction is expected to begin in the fall of 2025 and finish at the end of 2027, with the updated WWTF commissioning at the beginning of 2028. A few of the unit processes may be deferred and do not require immediate replacement or installation.

The following is a description of the existing processes and equipment functions and the modifications or additions.(see Figure 5 – ALASD Proposed Site Layout).

Flow Equalization (EQ)

- *Route flow from LS1 for approximately one mile along W Winona Road SW to the ALASD equalization basin (this may be accomplished with existing forcemain piping or in separate project (to be determined)..*
- *Add a new 1.5 million gallon lined flow equalization basin in the existing basin.*
- *Add new gravity flow pipe from the equalization basin to the existing influent pump station.*

Influent Pumping

- *Expand the existing wetwell and add two additional access hatches for accessibility. This upgrade is optional and may be deferred.*

Headworks

- *Screening: Replace both the existing 6-mm perforated plate screens with new 6-mm perforated plate screens, relocating a new screen to the third knockout screen channel to allow for the grit processing equipment to fit in the existing Headworks Building.*
- *Grit Processing: Replace the existing grit washer and classifier with a new grit processing system and replace piping from the two existing grit pumps.*

Primary Treatment

- *Primary Clarifiers: Add a new primary clarifier splitter structure upstream of the primary settling tanks and one new 45-foot clarifier adjacent to the existing primary settling tanks. Replace existing primary clarifier collectors.*

Secondary Treatment

- *Fine Screens: Two new 2-mm fine screens housed in a new building located between the primary clarifiers and the Biological Nutrient Removal tanks.*
- *Aeration Basins: 3-Stage biological nutrient removal trains which include the existing aeration tanks being converted to three biological nutrient removal trains plus two new biological nutrient removal trains. Each train includes a pump station and piping to route flow back to the first anoxic zone of the biological nutrient removal train. Anaerobic and anoxic zones are separated using concrete baffle walls and mixed with submersible mixers. New fine pore aeration and control systems are included in each aeration zone. Modify or build a new primary effluent/return activated sludge splitter structure to route flow to each biological nutrient removal train. Reduce existing aeration basin effluent weirs by 1-foot to compensate for headloss from the fine screens.*
- *Membrane Bioreactor: Add a new membrane filtration membrane bioreactor facility including a new building to enclose the submerged membrane units, four new membrane tanks each housing seven membrane cassettes with room for two additional future cassettes, four new return activated sludge pumps, four new permeate pumps, chemical systems, and other ancillary equipment. One membrane tank may be deffered. Expansion of the existing Solids Handling Building blower area to house one additional blower and an additional primary sludge pump and grinder. The blower installation may be deferred.*
- *Secondary Clarifiers: Convert the two existing 55-foot secondary clarifiers into return activated sludge deoxygenation/denitrification basins. Convert the existing 75-foot secondary clarifier to a centrate equalization tank to minimize the impacts of the digester recycles on enhanced biological phosphorus removal performance and stability.*

Tertiary Treatment

- *Removal of the three existing cloth disk filters from the Filter and Control Building.*

Disinfection

- *Replace the gaseous chlorine disinfection system with a sodium hypochlorite disinfection system. The existing chlorine contact channels do not require any changes. Expand the existing sodium bisulfite dechlorination system. Alternative*

disinfection systems that may also be considered included peracetic acid or ultraviolet disinfection.

Outfall

- *The existing outfall into Lake Winona will remain in place and does not require any additional changes or upgrades.*

Dissolved Air Flotation Thickening (DAF)

- *Replace the existing DAF with a suspended air flotation thickening (SAF) system.*

Aerobic Digestion

- *Replace the existing fine pore diffusers and header piping in each of the four digester cells.*
- *Replace the existing 100-ton chiller with a 125-ton chiller.*
- *Replace the piping from the blowers to the digester headers.*

Dewatering

- *Add a second centrifuge and expand the Solids Handling Building to accommodate the additional centrifuge.*
- *Replace polymer system with new unit.*

Biosolids Storage

- *Reclaim the existing biosolids pad and add concrete bunker walls and repave bituminous surface*

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

ALASD is required to upgrade its facilities to meet NPDES nutrient limits and is currently operating at or near capacity and must be expanded to meet future growth needs for 2045. Much of the equipment required for WWTF operations is at the end of it's useful life and requires replacement. The proposed project will improve the effluent water quality through advanced nutrient removal technology and allow continued growth in the communities served by ALASD.

The beneficiaries of the initial and future planned expansions include current and future residents of the ALASD service, current and future businesses, as well as anyone using the area lakes for recreational purposes. The advanced regional WWTF improvements help protect the existing and future uses of the area lakes for the ALASD Service Area as well as those communities and populations beyond the Service Area boundary.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☐ Yes ☒ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The proposed improvements as described in item 4. Project components that may be deferred are identified in the proposed project description in item 4 and will depend on plant performance, growth, and financial considerations. These future deferments of expansion may include improvements to the existing influent pump wetwell, an additional blower and tank for the membrane bioreactor system, converting the DAF to a SAF, and improvements to the existing biosolids storage pad as listed in item 4 above. For future ALASD capacity expansion, an evaluation will be conducted to determine if environmental review is mandatory or otherwise warranted.

e. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No
If yes, briefly describe the past development, timeline and any past environmental review.

5. Project magnitude data

Total Project Area (acres) 10.9 or Length (miles) 1 mile for LS1 piping
Number of Residential Units: Unattached NA Attached NA maximum units per building NA
Commercial/Industrial/Institutional Building Area (gross floor space): total square feet NA
Indicate area of specific uses (in square feet): 50,225 sq ft for equalization basin, 2,375 sq ft for the thirs primary clarifier, 8,890 sq ft for membrane bioreactor Building, 7,100 sq ft for two additional biological nutrient removal trains, 5,300 sq ft for the fine screens building, 620 sq ft for blower building addition, 550 sq ft for the solids building addition

Office	NA	Manufacturing	NA
Retail	NA	Other Industrial	NA
Warehouse	NA	Institutional	NA
Light Industrial	NA	Agricultural	NA

Other Commercial (specify) NA
Building height 21 feet If over 2 stories, compare to heights of nearby buildings NA

6. Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Unit of government	Type of application	Status
MPCA	Preliminary Effluent Limit Review	Submitted
MPCA	NPDES Permit	To be submitted
MPCA	Facility Plan	Submitted
MPCA	Plans and Specifications Review	To be submitted
City of Alexandria	Building Permit	To be submitted

7. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

Adjacent land to the east is the Alexandria Municipal Airport. Lake Winona is located north of the plant. Adjacent land to the south and west is used primarily for agricultural purposes. The nearest residential house is approximately 0.25 miles from the plant site and the nearest residential development is within 0.5 miles. Use of the site for a WWTF does not conflict with adjacent land use. No known environmental hazards due to past site use is known. A Magellan/Williams gas pipeline runs through the plant site south of the planned improvements and should not be impacted.

8. Cover types. Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Types 1-8 wetlands	0	0	Lawn/landscaping	3.0	2.5
Wooded/forest	0	0	Impervious Surfaces	3.5	4.0
Brush/grassland	3.1	3.1	Other (describe)	0	1.3 (EQ Basin)
Cropland	0	0			
			Total	9.6	10.9

9. Fish, wildlife, and ecologically sensitive resources.

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

Past use of the proposed project site has been for wastewater treatment. Wildlife in the vicinity consists primarily of species native to rural central Minnesota, including deer, fox, rabbit, raccoon, muskrat, duck, heron, geese, pheasant, coyote, and other small mammals. The majority of construction will occur within the existing fence line, and the EQ pipe routed from LS1 will be constructed along W Winona Road SW, minimizing disturbance to the surrounding habitat.

Short-term impacts on wildlife include the effects of construction, including noise and traffic. Species relocation as a result of construction is not anticipated. The NPDES Stormwater Construction Activity Permit will mitigate the effects of erosion and sedimentation to nearby waters. The proposed project is not expected to cause long-term impacts to wildlife in the area.

Treated wastewater is discharged to Lake Winona, which is part of the Lake Winona-Henry-Agnes chain of lakes. Minnesota Department of Natural Resources (DNR) records indicate the fish community in the chain of lakes includes black bullhead, yellow perch, white sucker, bluegill, largemouth bass, northern pike, and walleye. Wild rice is present on the Long Prairie River, approximately thirty miles downstream of the ALASD discharge. MPCA's water quality review has provided preliminary effluent limits for sulfate including a mass loading cap. Further review will be completed by the MPCA during the NPDES permit modifications to finalize the effluent limits for the ALASD WWTF.

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?
☒ Yes ☐ No
If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the Minnesota Department of Natural Resources (DNR) Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: #2022-00896
Describe measures to minimize or avoid adverse impacts.

The DNR Natural Heritage Review indicates that there are no endangered or threatened species within the vicinity of the project site, though it does indicate that there is a state listed species of concern (Mudpuppy) within the project vicinity. Mudpuppy habitat consists of deep-water zones of lakes and littoral zones of lakes. Measures will be taken to minimize impact to Mudpuppy habitat such as dewatering and minimizing surface water discharge into Lake Winona. The U.S. Fish and Wildlife Service IPaC Survey indicates that federally designated endangered species are located within the vicinity of the project site. Endangered species include Northern Long-eared Bats and Tricolored Bats, and

candidate endangered species include Monarch Butterfly. Migratory birds within the vicinity include Bald Eagles, Black-Billed Cuckoo, Bobolink, Canada warbler, Chimney Swift, Eastern Whip-poor-will, Marbled Godwit, Red-Headed Woodpecker, Rusty Blackbird. IPaC does not list any critical habitats.

The DNR Natural Heritage Review map indicates that the following resources are NOT within the project site:

- *Calcareous Fens*
- *MBS sites of biodiversity significance*
- *DNR old growth stands*
- *DNR native plant communities*
- *Lakes of biological significance*
- *USFWS regulatory layers*
- *Audubon MN important bird area*
- *Prairie conservation plan areas*

10. Physical impacts on water resources. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☒ Yes ☐ No
If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

The WWTF continually discharges to Lake Winona, and surface water features within one mile of the facility include Lake Winona (AUID #21-0081-00) and Lake Latoka (AUID #21-0106-01). Lake Winona's impaired uses include aquatic life and aquatic recreation.Total phosphorus limits established in the Lake Winona TMDL for Total Phosphorus are incorporated as a compliance schedule into the ALASD NPDES permit and are integral to the proposed improvement project at the WWTF. Lake Winona is also as impaired due to excess chloride. ALASD's NPDES permit also includes requirements and compliance reporting on chloride reduction measures. Water then flows from the outfall in Lake Winona to Lake Agnes, Lake Henry, through a wetland to Lake Le Homme Dieu, Lake Carlos, to the Long Prairie River. Lake Agnes and Lake Henry are impaired for nutrients and chloride. The Statewide Mercury TMDL is applicable to Lake Agnes, Lake Le Homme Dieu, Lake Carlos and reaches in the Long Prairie River. The Long Prairie River is also impaired for low dissolved oxygen and is included in the Long Prairie River Watershed – Low Dissolved Oxygen TMDL. The WWTF proposed effluent limits are set to protect Lake Winona and downstream lakes.

There are no wetlands on the ALASD site, however, there are freshwater forested wetlands located to the west of the facility and freshwater emergent wetland located at the existing outfall. Construction will not take place on any of the designated wetlands. Note that the designated freshwater emergent and forested wetlands designated on the wetlands inventory are the existing stormwater and polishing ponds (see Figure 9 – ALASD Wetlands Inventory).

11. Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

Previous geotechnical investigations show the ground water to be roughly 25 feet below grade. All new structures will be less than 21 feet below grade. There are no wells on the facility site per the MDH Well Index (see Figure 10 – ALASD MDH Well Index). There are two private wells located to the west of the facility, 615748 at 90 feet deep and 739270 at 97 feet deep. If minor dewatering is required, ground water will be pumped to the stormwater sewer, where it is conveyed to the stormwater detention pond.

12. Water-related land use management districts. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☐ Yes ☒ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

See Figure 11 - USDHS FEMA 100-Year Flood Zones and Figure 6 - Alexandria Zoning Map 2022.

13. Water surface use. Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

14. Erosion and sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **1.8** Acres: **1,950** cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project

construction.

There are no steep slopes or highly-erodible solids at the proposed site. Best management practices will be used during and after construction including silt fences and hay bales to prevent erosion. Erosion control and re-establishment of vegetative ground cover will be required in the contract documents.

Erosion control will include the following:

- *limiting disruption to ground cover only in areas of excavation/staging area;*
- *utilizing silt fencing downstream of areas which are graded; and*
- *use of construction management practices to limit duration of exposed solids to wind and rain.*

15. Water quality – surface-water runoff.

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any storm water pollution prevention plans.

Runoff quality or quantity will not be altered by this project. The proposed project will result in a slight increase in impervious area but the site is furnished with a stormwater basin to receive all site runoff and provide sedimentation prior to discharge to Lake Winona. The stormwater basin is located between the Administration Building and Lake Winona on the northwest corner of the property. Prior to construction, the existing basin used for stormwater had a capacity of approximately 3.37 million gallons. With the addition of the EQ basin, the stormwater basin capacity will be resized to 1.8 million gallons (i.e. actual stormwater capacity requirements are less than the remaining basin size).

The Project construction will cause soil disturbance so the construction contractor will be required to obtain a Construction Stormwater (CSW) Permit as a part of the project and manage the stormwater runoff utilizing best management practices (BMPs). ALASD will develop a Stormwater Pollution Prevention Plan (SWPPP) that will identify BMPs to mitigate impacts to surface water. Erosion control blankets, silt fences, and bio rolls are likely to be included in the SWPPP. Disturbed soils will be stabilized and project construction will comply with the CSW Permit.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The Project's construction activities and resulting drainage will take place within 1 mile of Lake Winona, which is classified as impaired water in the MPCA's 2018 Impaired Waters List. To protect these waters, ALASD will ensure contractors follow the "Additional Requirements for Discharges to Special or Impaired Waters" outlined in Section 23 of the CSW Permit.

16. Water quality – wastewater.

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

ALASD will maintain the existing discharge location into Lake Winona and remain a Class A treatment facility. Current flows and loads to the WWFT include residential and commercial discharges including six permitted significant industrial users. Significant industrial users and daily average permitted flow are as follows: SunOpta Aseptic 175,000 gpd, SunOpta Ingredients 220,000 gpd, 3M 60,000 gpd, TWF 60,000 gpd, Alexandria Industries 1,800 gpd, and Douglas Finishing 35,000 gpd. ALASD currently serves approximately 10,500 customers with an estimated 60% residential flow, 30% commercial flow and 10% industrial flow.

Flow and load projections were determined by implementing a 1.5 percent compounded growth using typical domestic waste sewage strength. The projections also included a 10 percent industrial growth allocation based upon current reported significant industrial users flow and loading.

The existing WWTF has a permitted average wet weather flow design capacity of 4.7 mgd, with a five-day carbonaceous biochemical oxygen demand loading of 7,100 pounds per day, total suspended solids loading of 6,000 pounds per day, phosphorus loading of 6.57 pounds per day, and 470 pounds per day of ammonia.

The following flows and loads were projected for 2045 using peaking factors calculated from historical plant data and MPCA flow determination worksheets:

ALASD WWTF Design Influent Flows and Loading Projections

Flows	*Units*	*Current - 2022*	*Year 2045*
Annual Average	*mgd*	*3.1*	*4.3*
Average Dry Weather	*mgd*	*2.7*	*3.7*
Average Wet Weather	*mgd*	*4.1*	*5.7*
Peak Hour Wet Weather	*mgd*	*8.0*	*10.9*
*Peak Instantaneous Wet Weather**	*mgd*	*11.9*	*16.6*
Carbonaceous Biochemical Oxygen Demand			
Annual Average	*lb/d*	*5,720*	*8,200*

Maximum Month	*lb/d*	*6,910*	*9,900*
Total Suspended Solids			
Annual Average	*lb/d*	*6,010*	*8,300*
Maximum Month	*lb/d*	*7,120*	*9,800*
Ammonia			
Annual Average	*lb-N/d*	*570*	*820*
Maximum Month	*lb-N/d*	*650*	*940*
Total Phosphorus			
Annual Average	*lb/d*	*130*	*190*
Maximum Month	*lb/d*	*150*	*210*

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

ALASD is an advanced treatment plant, currently utilizing primary clarification, activated sludge aeration, secondary clarification, filtration, and disinfection prior to discharge to the Lake Winona. ALASD has a Wastewater Permit for discharge of treated wastewater (effluent) to Lake Winona for the existing WWTF and will be requesting a permit reissuance with modifications as part of this project. Effluent limits are established in permits through the National Pollutant Discharge Elimination System (NPDES) for any point source that discharges into a water of the United States. The effluent limits are in place to ensure the discharge does not harm water quality or people's health. Through the construction of this Project, wastewater treatment will continue uninterruptedly and effluent limits for the discharge to Lake Winona are expected to be met or exceeded at all times.

Every NPDES permit authorizing an expanded discharge with a net increase in pollutant loading must demonstrate it has also satisfied conditions in Minnesota antidegradation rules (Minn. R. 7050.0265 and 7050.0280) to allow for this change in water quality. The purpose of the antidegradation review is to achieve and maintain the highest possible quality in surface waters of the state. The WWTF improvement project will be designed to meet the effluent limits established in the reissued NPDES Permit and comply with antidegredation requirements.

Water flows from the outfall in Lake Winona to Lake Agnes, Lake Henry, through a wetland to Lake Le Homme Dieu, Lake Carlos, to the Long Prairie River. These lakes are all designated as impaired waters. The proposed effluent limits are set by MPCA to protect and improve water quality for Lake Winona and downstream lakes.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

The projects purpose is to enhance the treatment capabilities and increase the treatment capacity of the existing WWTF.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Not applicable.

17. Geologic hazards and soil conditions.

a. Approximate depth (in feet) to Groundwater 25 minimum; *25* average.
Bedrock: *210* minimum; *240* average.

Describe any of the following geologic site hazards to groundwater and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

ALASD's underlying geology consists of extrusive rocks of mafic to felsic composition, associated volcanogenic rocks and derivative graywacke with no susceptible geologic features (see Figure 7 – ALASD Geology Map). ALASD will minimize site disturbances during construction by using best management practices and performing standard geotechnical testing prior to the start of construction.

b. Describe the soils on the site, giving U.S. Soil Conservation Service (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

According to the NRCS soil survey (see Figure 8 – ALASD NRCS Soil Survey), the following soil types are located at the facility site:

- *Haslie, Seelyeville, and Cathro soils (1113) – Wet mixed forest, frequently ponded. 0 to 1 percent slopes. Located near the outfall. No construction will take place on this soil type.*
- *Arvilla sandy loam (AsB) - Sandy prairie. 2 to 6 percent slopes. Located to the east of the facility. The project will not have any construction occurring on this soil type.*

- *Sandberg loamy sand (D8B/C) – Shallow, sandy gravel. 1 to 12 percent slopes. The influent pump station and the biosolids pad are located on these soils, and the new EQ basin (located in the old stormwater basin) will be constructed on this soil type. The estimated volume of this soil type required for the EQ basin excavation is 50,225 cubic feet over 1.3 acres.*
- *Water, Miscellaneous (M-W) – The old polishing ponds from the original plant construction are classified as this and will not be used for this project.*
- *Udipsamments (cut and fill, Ud) – The majority of the plant is located on cut and fill soil. The remainder of the WWTF, excluding the EQ basin and the influent pump station, is located on this soil type. The estimated volume of this soil type required for excavation is 65,340 cubic feet over 0.5 acres.*

The soil surrounding the ALASD is granular is composition, mostly composed of sandy loam. The potential for contaminants to infiltrate into the groundwater through this soil type is high. During construction, any hazardous materials will be stored in leak-proof containers and located in safe storage when not being used. In case of a spill of chemical or hazardous materials, the Minnesota Duty Officer will be notified along with proper clean-up and disposal of the spillage in accordance to federal and state requirements.

18. Solid wastes, hazardous wastes, storage tanks.

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

Solid materials and grit collected during preliminary treatment are hauled to a licensed solid waste disposal facility. The WWTF produces about 12 cubic feet per day. It is anticipated that the proposed project will produce more in proportion as the flow increases. Dewatered biosolids (dewatered stabilized sludge) is a by-product of the wastewater treatment system. The biosolids are land applied on agricultural land twice a year. The biosolids produced at the WWTF are classified as Class B Biosolids. The biosolids are stored at the site of application until it is ready to be applied. There is an impervious storage pad at the WWTF if the biosolids cannot be transported as it accumulates. ALASD produces approximately 850 dry tons per year of biosolids. Current concentrations of heavy metals and other toxics substances concentrations in the dry sludge are extremely low and meet federal and state requirements for exceptional biosolids. ALASD currently uses two privately owned farms at approximately 250 acres total for land applying biosolids.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

There is a room on-site dedicated to the chlorine cylinders used for disinfection, which will be removed during project demolition. If any hazardous materials are found during construction, the material will be removed and disposed of according to MPCA guidelines. Future hazardous materials to be added on site with the project expansion include sodium hypochlorite, with residual chlorine being quenched with sodium bisulfite. These chemicals will be stored in FRP tanks, either with a containment pad or double walled, and must be stored in separate rooms to prevent any chemical reactions.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

There is a 1,500-gallon fuel oil tank located underground. It is used to fuel the emergency generator. The fiberglass tank is buried four feet deep and is located north of the filter building and west of the solids contact tank. In the event contamination or environmental hazards are encountered, the Minnesota State Duty Officer will be contacted and the contractor will be required to cease work until a remediation plan can be implemented.

19. Traffic. Parking spaces added: *0* Existing spaces (if project involves expansion): *18*
Estimated total average daily traffic generated: *18 vehicles* Estimated maximum peak hour traffic generated (if known) and its timing: *0* Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The Project is not expected to generate a significant change in traffic. The Facility expansion is not expected to require an increase in staffing and therefore no change in average daily traffic or maximum peak hour traffic is expected. Additionally, sludge disposal from the proposed plant design will result in fewer hauled loads than the existing operations because of process efficiencies being implemented. While no long-term impact on local traffic is anticipated, construction work will temporarily increase traffic volumes on local roadways. However, traffic impacts are expected to be minimal due to the plant location on an isolated roadway exclusive to the Facility. Best practices for construction zone management and transportation will be utilized to minimize exposure and impacts to road users, workers, and traffic.

20. Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *Environmental Assessment Worksheet (EAW) Guidelines* about whether a detailed air quality analysis is needed.

During construction, there will be a temporary increase in exhaust emissions from heavy construction equipment. These would result in short-term impacts on local air quality and are not expected to significantly impact residences or commercial entities due to the project's distance from these areas.

21. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

There are two existing generators on site; a 400 kW and a 300 kW emergency generator on site in case of power failure. A new 300 kW emergency/backup generator will be added as part of the new MBR building. The emergency generators only run during power outages. Past experience shows that the vast majority of commercial power outages last less than 30 minutes.

22. Odors, noise, and dust. Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

Mechanical treatment plants can produce odor during operation. The odors produced by the proposed plant expansion will not increase or change in nature. Currently, the MPCA has not received any complaints regarding odor from the facility. During construction, there will be a temporary increase in dust emissions. The contractor will be required to employ appropriate measures to minimize the amount of dust produced during construction, such as watering the site, and plant temporary vegetative cover. During construction, there will be a temporary increase in noise generated from heavy machinery. The contractors will comply with all city noise ordinances. Noise mitigation will include restricting the construction hours to those times that will not disturb residents.

23a. Nearby resources. Are any of the following resources on or in proximity to the site? Projects should search the Minnesota State Historic Preservation Office's (SHPO) National Register of Historic Places database.

***Note:** Project proposers must contact the SHPO at datarequestshpo@mnhs.org to request a database review to obtain information on any known historical or archaeological sites in the project area. Include a copy of correspondence with SHPO with the submittal of this EIW form.

a. Archaeological, historical, or architectural resources? ☐ Yes ☒ No
b. Prime or unique farmlands or land within an agricultural preserve? ☐ Yes ☒ No
c. Designated parks, recreation areas, or trails? ☐ Yes ☒ No
d. Scenic views and vistas? ☐ Yes ☒ No
e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

Figure 13 - SHPO Letter No: 2023-0650 included in attachments.

23b. Section 106 Review (36 CFR 800) is required for all CWRF projects. The following forms can be found on the MPCA Wastewater and Stormwater Financial Assistance website at https://www.pca.state.mn.us/ppl. Select Clean Water Revolving Fund tab; then scroll to Facilities Plan and Facilities Plan Supplement for Wastewater Treatment Systems heading.

a. Project is exempt from review (attach completed *Exemption Checklist*) ☐ Yes ☒ No
b. Project is required to complete further Section 106 Review: ☒ Yes ☐ No
   a. SHPO Figure 13 - SHPO letter included in attachments
   b. Tribal consultation Per the MPCA Tribal Contacts Form (https://www.pca.state.mn.us/sites/default/files/p-gen5-25.pdf), no tribal agencies are listed for water permits for Douglas County, MN
   c. Other Consulting parties

24. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No

If yes, explain.

25. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☒ Yes ☐ No

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

The ALASD WWTF and proposed improvements are located in the City of Alexandria. The City has a comprehensive plan and future land use map. The existing/proposed facilities are located within an area planned for industrial land use.

26. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☐ Yes ☒ No

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with

respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

27. Cumulative impacts. Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

The project construction will remain within the existing property boundary. The ALASD property is an industrial zoned area in the City of Alexandria.

The proposed project is designed to treat wastewater flows from projected future growth and development. This project is in response to community growth within the ALASD service area and is intended to provide sufficient capacity through 2045. The availability of additional WWTF capacity could stimulate future residential and commercial development which would be accompanied by increased traffic, stormwater runoff and solid waste generation. The City, Douglas County and other jurisdictions will need to regularly assess and address impacts that occur due to land development within their jurisdiction boundaries. Cumulative potential impacts that may occur will be mitigated through the enforcement of federal, state, and local laws designed to limit the associated environmental impacts. Future development would also be subject to environmental review requirements.

28. Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

Not applicable.

29. Summary of issues. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

Not applicable.

Figure 1 - County Map Indicating Project Site

Figure 2 - USGS 7.5 Minute Map with Project Site

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
OnDemand Topo

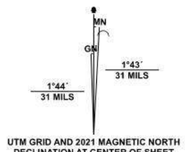
7.5-MINUTE TOPO 2 QUADRANGLE
Custom Extent
7.5-MINUTE TOPO

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 15T

Data is provided by The National Map (TNM), is the best available at the time of map generation, and includes data content from supporting themes of Elevation, Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover, and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC) Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: https://nationalmap.gov



UTM GRID AND 2021 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

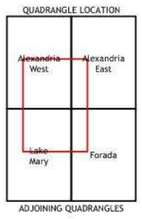
U.S. National Grid
100,000 - m Square ID
UL
Grid Zone Designation
15T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium

QUADRANGLE LOCATION



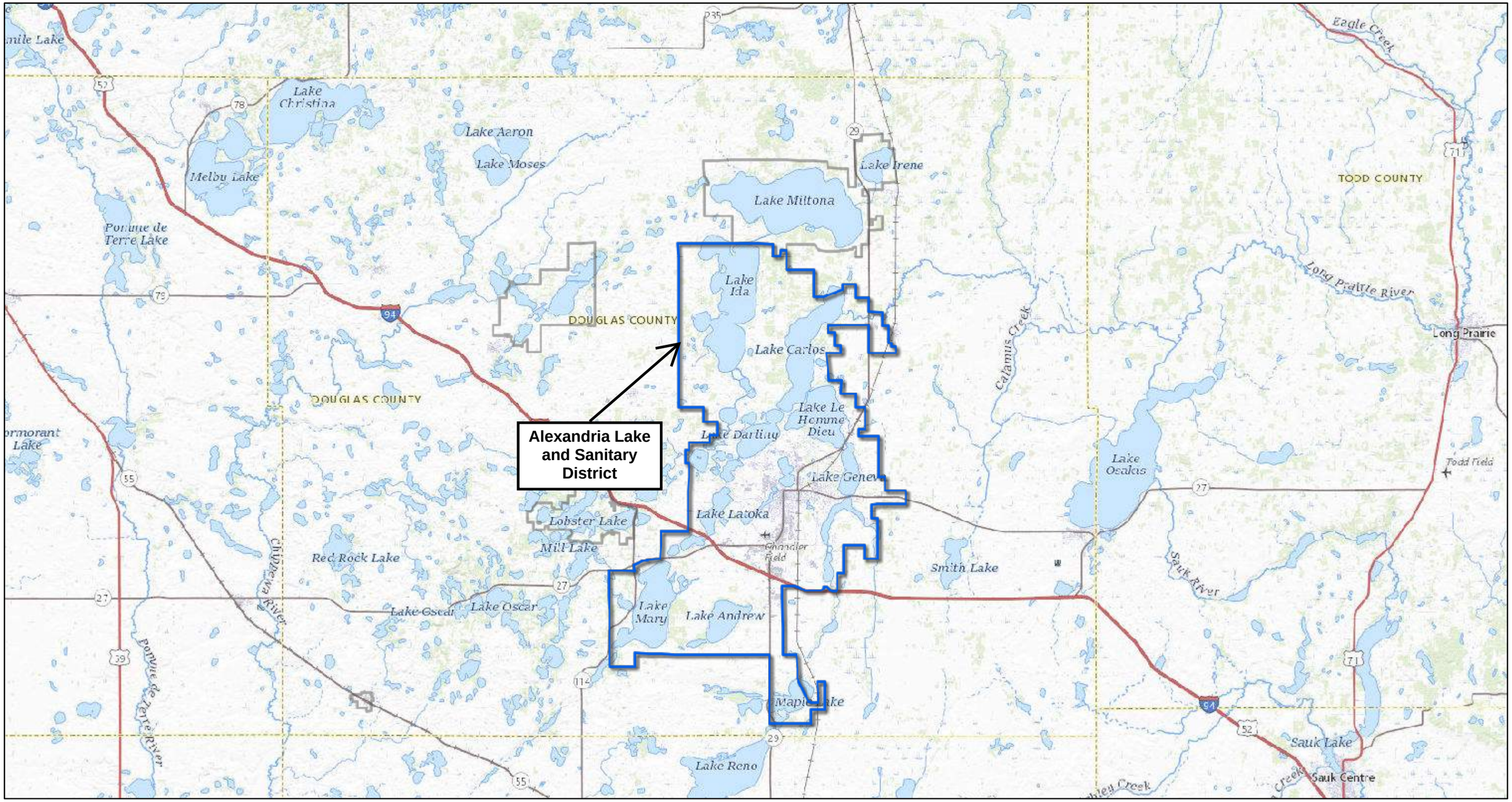
ADJOINING QUADRANGLES

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

7.5-MINUTE TOPO 2, MN
2022

Figure 3 - ALASD Sewer District Boundary



PL

NP

86*6 7KH 1DWLRQDO 0DS 1DWLRQDO %
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,QIRUPDWLRQ 6\VWHP 1DWLRQDO +\
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ALASD Site Map

Figure 4 - ALASD Site Map

Figure 5 - ALASD
Proposed Plant Layout

ALASD Proposed Site Improvements

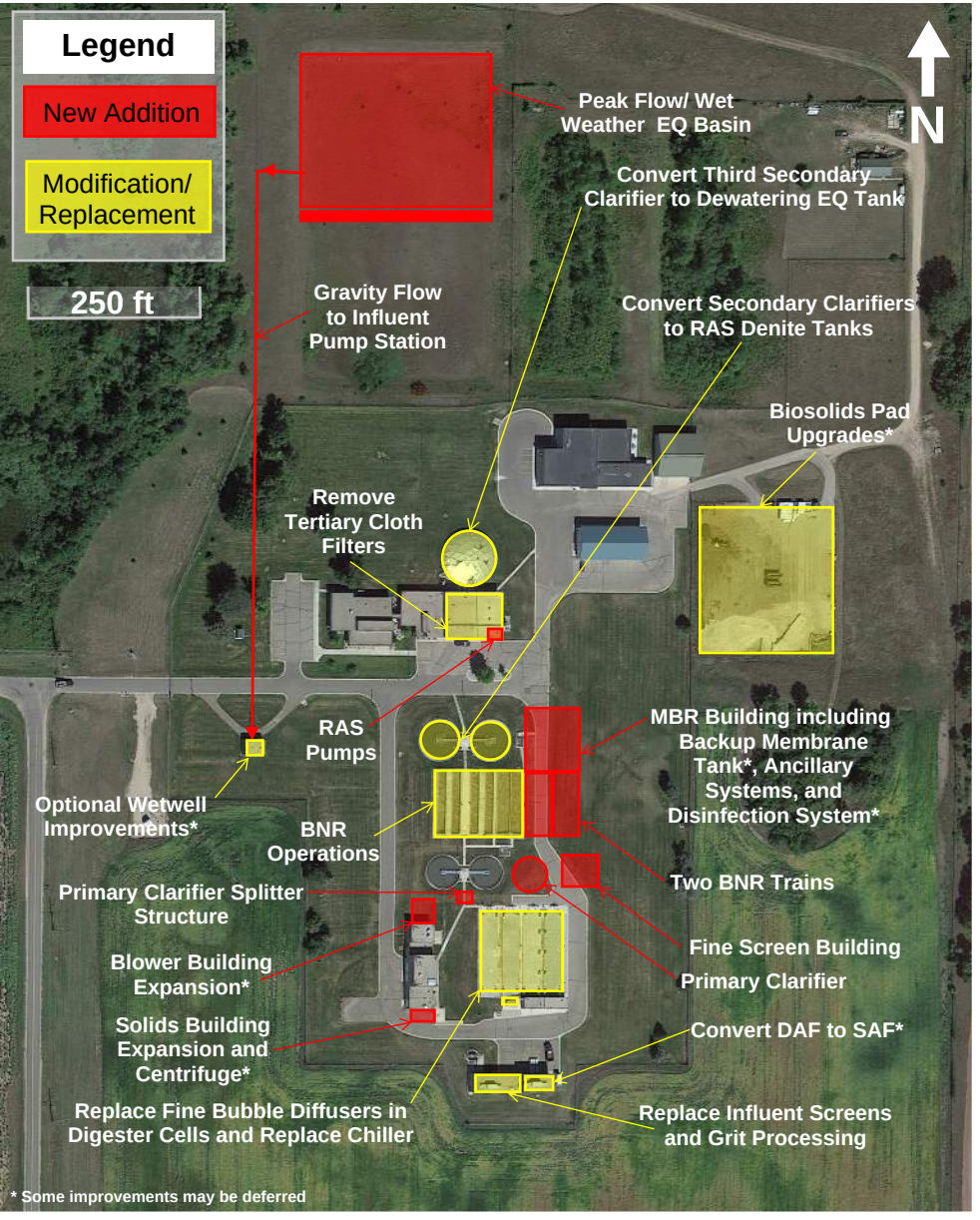


Figure 6 - Alexandria, MN Zoning Map (2022)

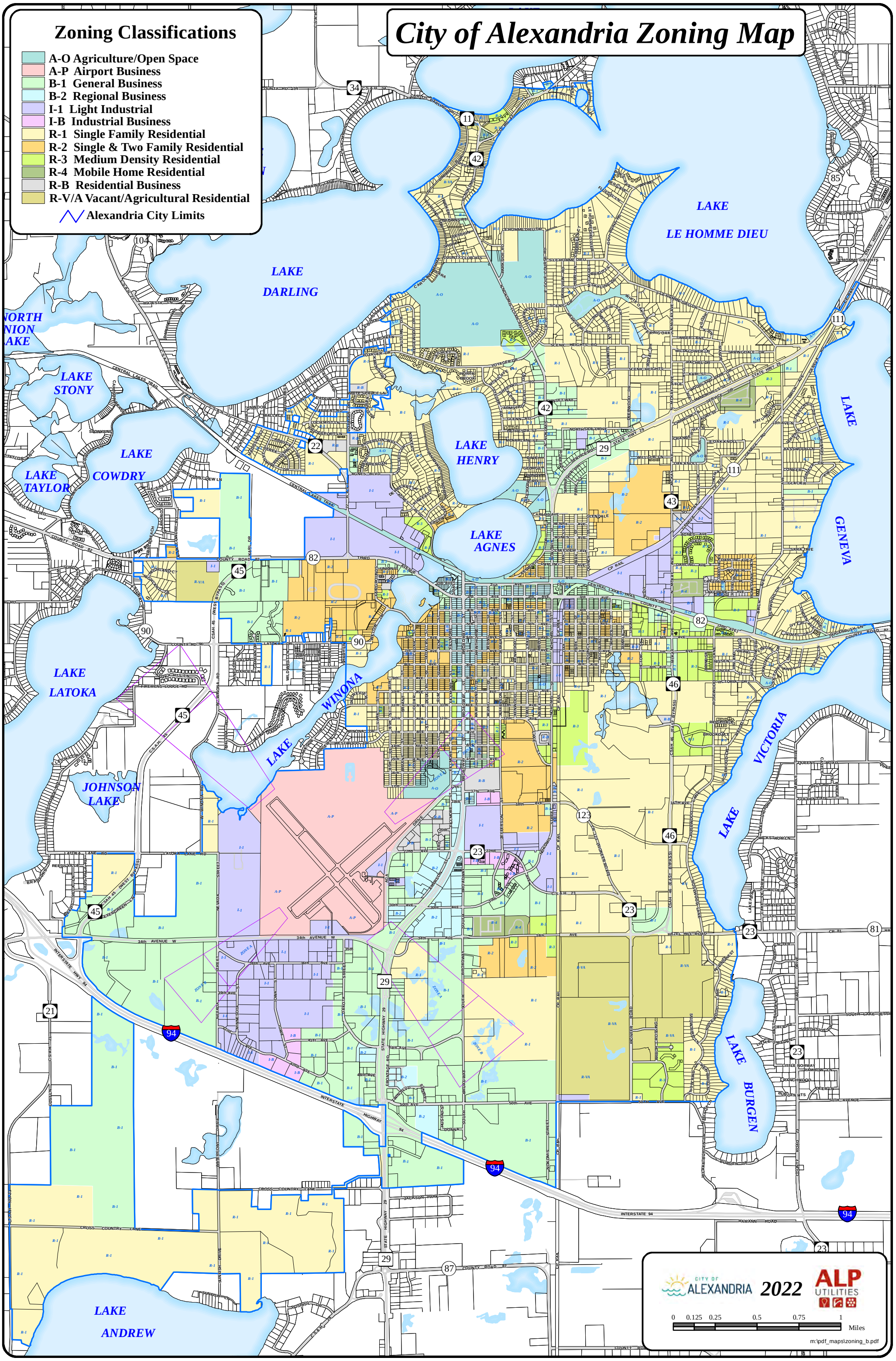
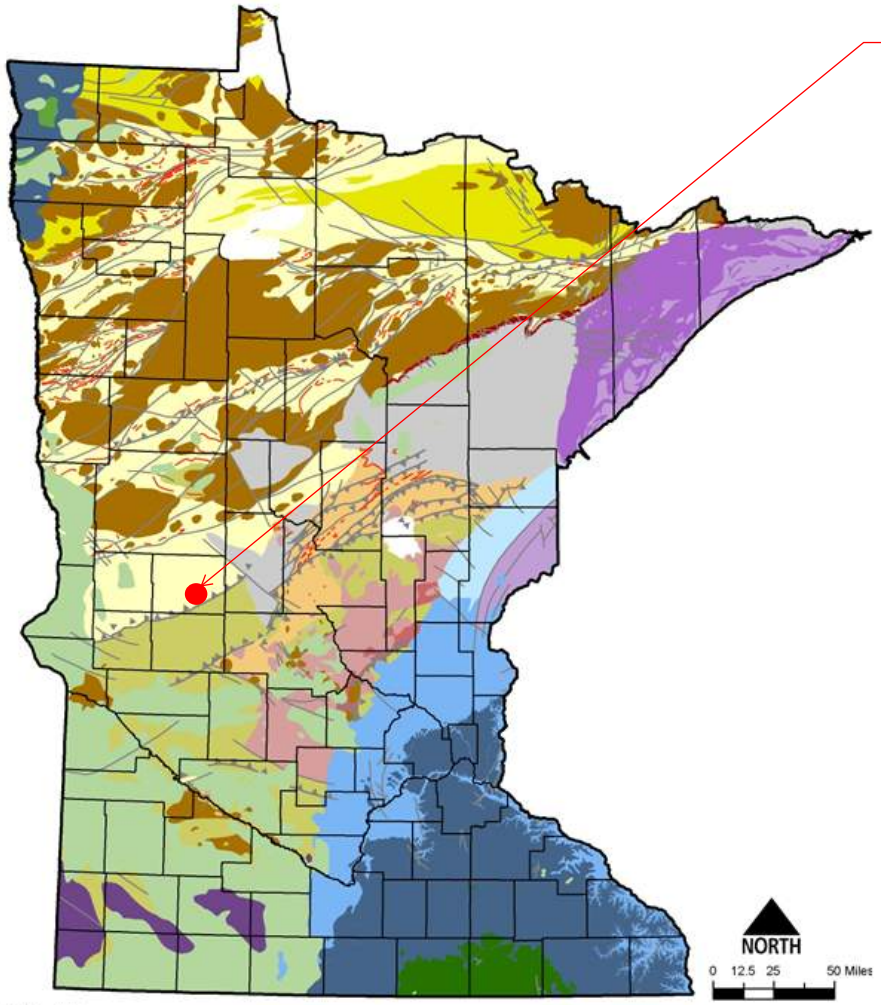


Figure 7 - ALASD Geology Map



Facility located in extrusive rocks of mafic to felsic composition, associated volcanogenic rocks and derivative graywacke

Description of Map Units

- Mudstone, siltstone, and some sandstone
- Red shale
- Limestone and dolostone
- Limestone, dolostone, and some sandstone and shale
- Sandstone, shale, and some carbonate
- Shale and arkosic sandstone overlain by quartz arenite
- Extrusive rocks of dominantly mafic composition
- Intrusive rocks of dominantly mafic composition
- Quartz arenite
- Intrusive rocks of dominantly granitic composition
- Extrusive and hypabyssal rocks of mafic and felsic composition. Includes volcaniclastic rocks of felsic composition
- Iron-formation with a basal quartz arenite
- Graywacke, silstone, and shale
- Quartz arenite and siltstone intercalated with mafic volcanic rocks, carbonaceous shale and iron-formation
- Intrusive rocks of dominatly tonalitic to quartz monzonitic composition
- Schist and granite-rich migmatite
- Extrusive rocks of mafic to felsic composition, associated volcanogenic rocks and derivative graywacke
- Quartzofeldspathic gneiss, amphibolite and other high-grade metamorphic rocks
- Inferred trace of a steeply dipping fault
- Iron-formation
- Inferred trace of a thrust fault

Figure 8 - ALASD NRCS Soils Classification Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Douglas County, Minnesota
Survey Area Data: Version 20, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 16, 2021—Aug 13, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1113	Haslie, Seelyeville, and Cathro soils, frequently ponded, 0 to 1 percent slopes	3.8	7.1%
AsB	Arvilla sandy loam, 2 to 6 percent slopes	14.6	27.6%
D8B	Sandberg loamy sand, 1 to 6 percent slopes	10.9	20.6%
D8C	Sandberg loamy sand, 2 to 12 percent slopes	6.8	12.8%
M-W	Water, miscellaneous	5.1	9.7%
Ud	Udipsamments (cut and fill land)	11.7	22.1%
W	Water	0.0	0.0%
Totals for Area of Interest		**53.0**	**100.0%**

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure 9 - ALASD Wetlands Inventory

ALASD Wetlands Inventory

November 30, 2022

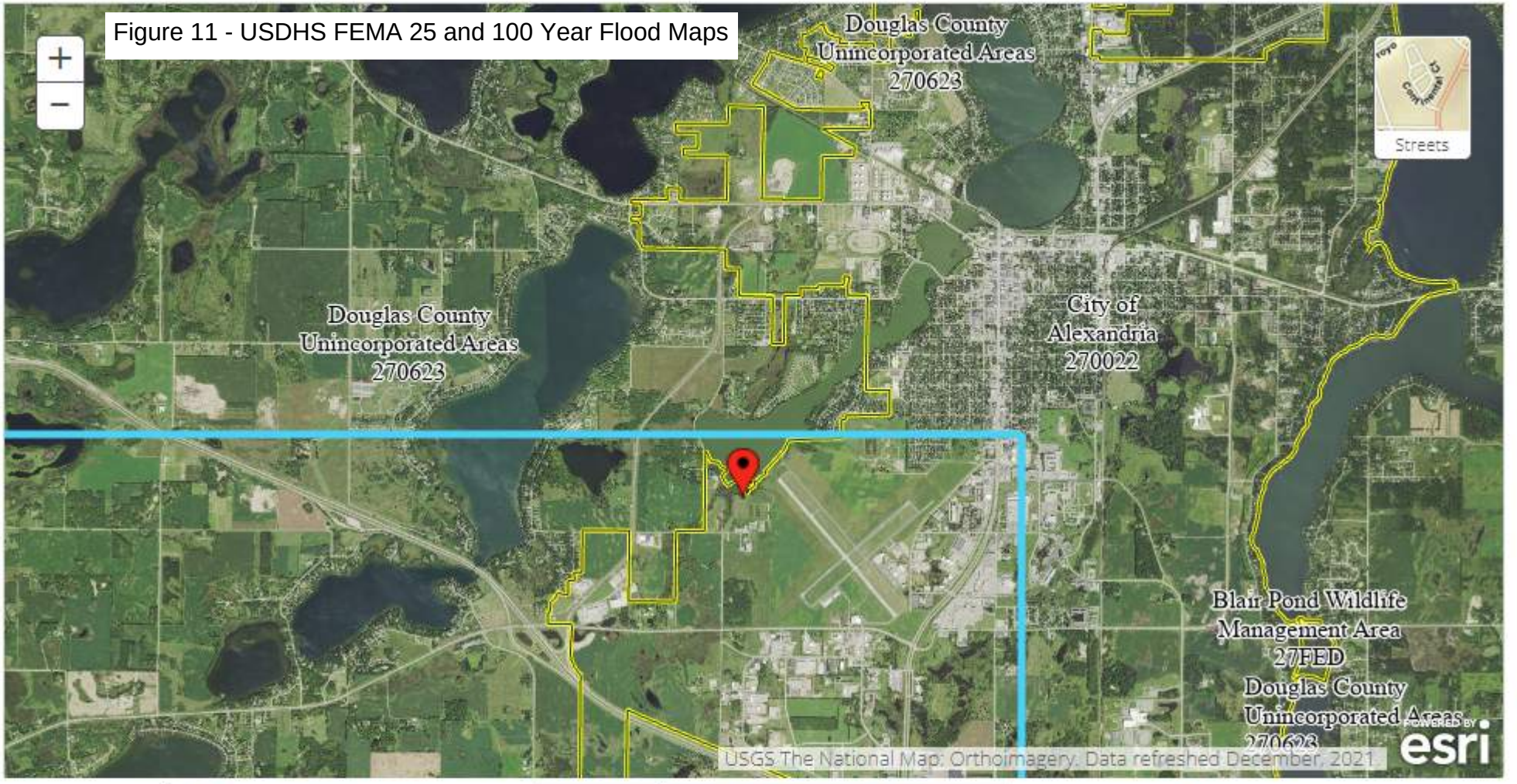
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Figure 10 - ALASD MDH Well Index

Figure 11 - USDHS FEMA 25 and 100 Year Flood Maps



PIN
- Approximate location based on user input and does not represent an authoritative property location

MAP PANELS
- Selected FloodMap Boundary
- Digital Data Available
- No Digital Data Available
- Unmapped

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D
- Otherwise Protected Area
- Coastal Barrier Resource System Area

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth
- Regulatory Floodway Zone AE, AO, AH, VE, AR

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

USDHS FEMA 100-Year Flood Zones

FEMA 100 Year Flood Zones in the U.S.A

FEMA 100 year Flood Zones

100 Year Flood Zones

Counties with Flood Data Available

No

Yes

FEMA 100 Year Flood Zones in the U.S.A

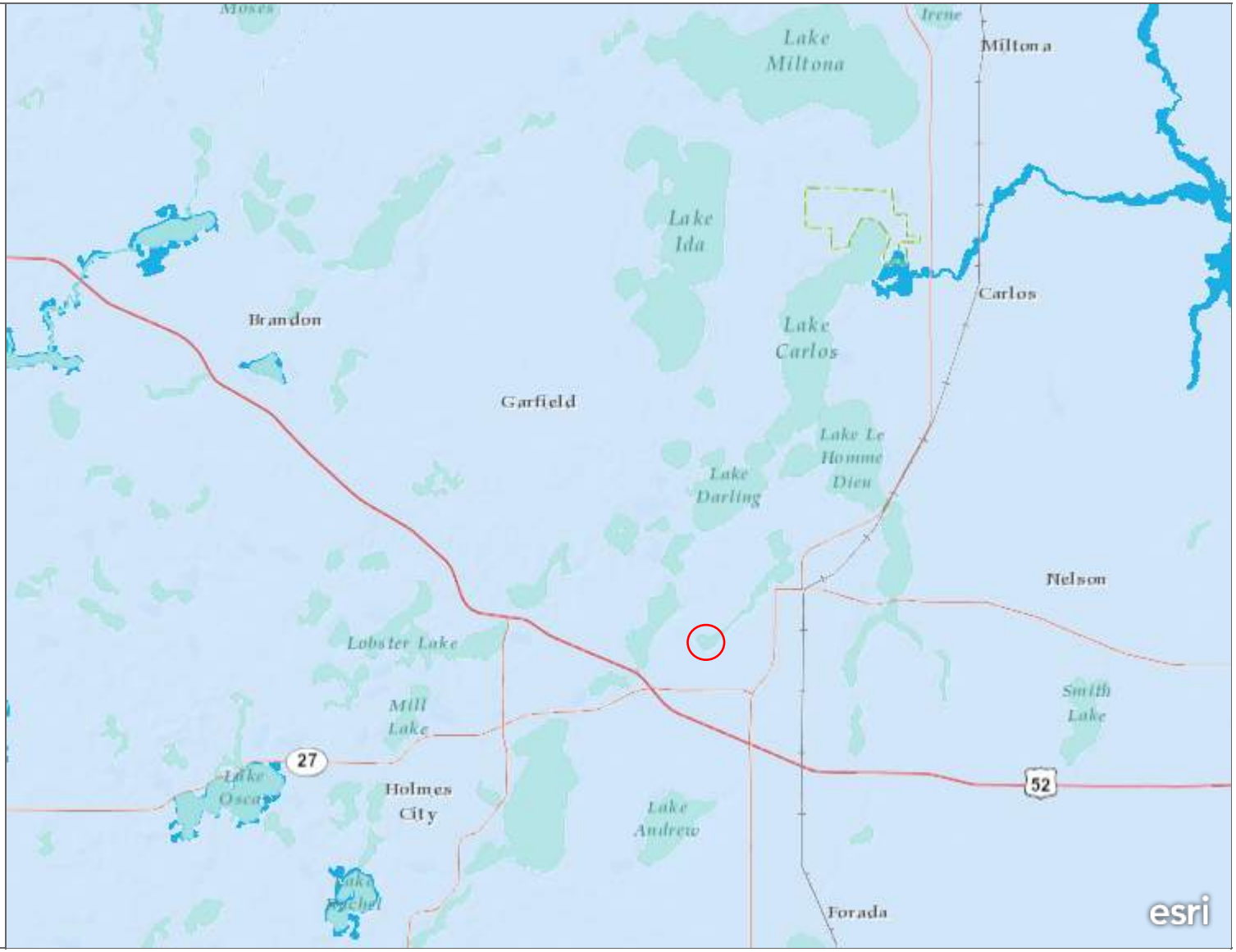
FEMA 100 year Flood Zones

100 Year Flood Zones

Counties with Flood Data Available

No

Yes



USDHS FEMA 100 Year Flood Zones

Figure 12 - Watershed Boundary Map

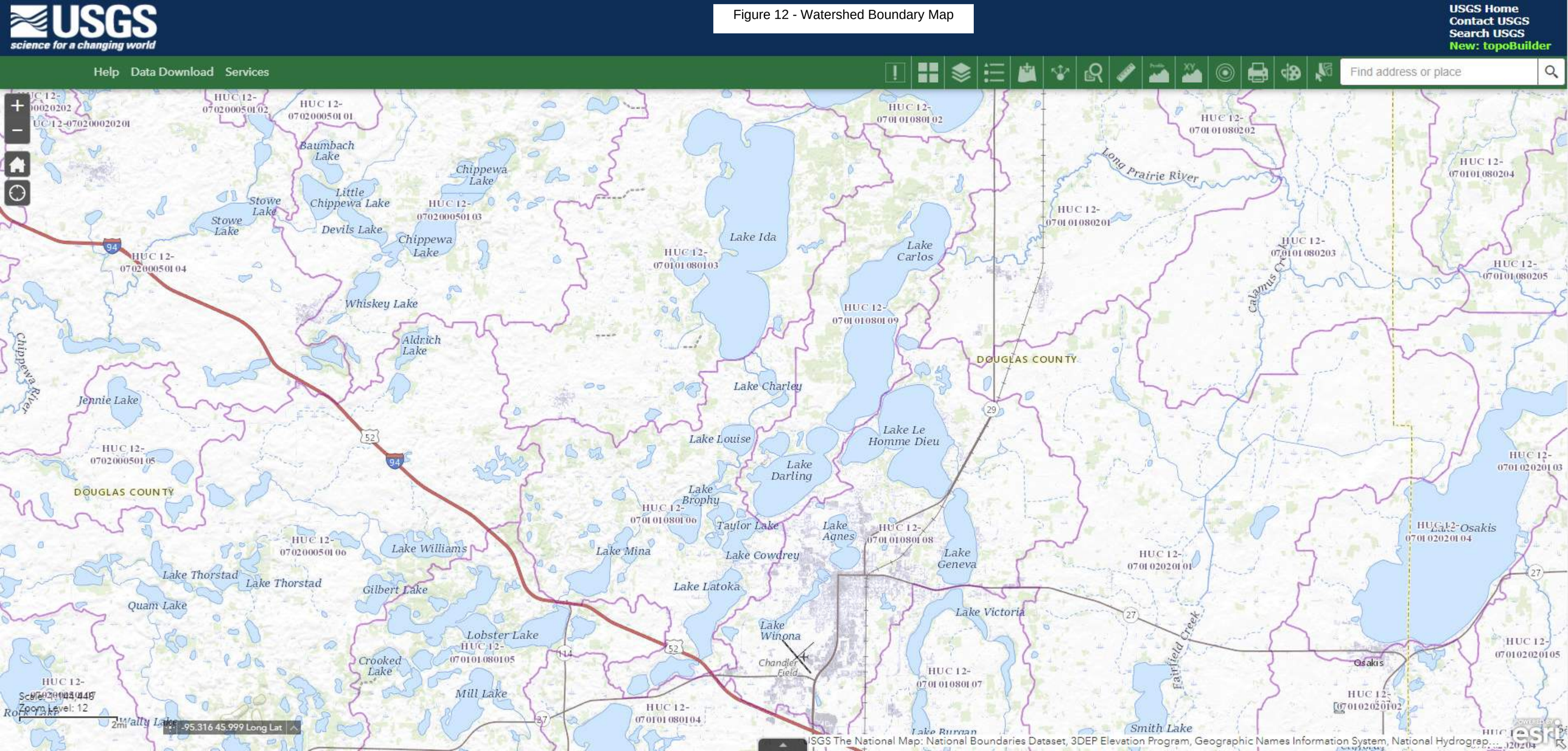


Figure 13 - SHPO Letter

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

February 24, 2023

Kellie Schaefer
Brown and Caldwell
370 Wabasha St N, Suite 500
St. Paul MN 55102

RE: Alexandria Lake and Sanitary District
Improvements to the existing wastewater treatment facility – construction of new buildings within the existing facility and upgrades to existing buildings
T128 R38 S25, Douglas County
SHPO Number: 2023-0650

Dear Kellie Schaefer:

Thank you for continuing consultation on the above referenced project. Information received on February 10, 2023, has been reviewed pursuant to the responsibilities given the State Historic Preservation Officer by Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing federal regulations, "Protection of Historic Properties" (36 CFR Part 800), pursuant to the provisions of the Memorandum of Understanding among the Minnesota Public Facilities Authority, the Minnesota Pollution Control Agency, and the Minnesota State Historic Preservation Office, and pursuant to the responsibilities given the State Historic Preservation Office by the Minnesota Historic Sites Act (Minn. Stat. 138.665-666) and the Minnesota Field Archaeology Act (Minn. Stat. 138.40).

We previously provided comments on this project in a letter dated January 20, 2023, requesting additional information on the extent of previous ground disturbance within the existing wastewater treatment facility. We have reviewed the documentation included in your February 10, 2023, correspondence and based on the level of previous ground disturbance, we do not believe that an archaeological survey is warranted for this project. Therefore, based on information that is available to us at this time, we have determined that **no historic properties will be affected** by the project as it is currently proposed.

Implementation of the undertaking in accordance with this finding, as documented, fulfills the agency's responsibilities under Section 106. If the project is not constructed as proposed, including, but not limited to, a situation where design changes to the currently proposed project diverts substantially from what was presented at the time of this review, then the agency will need to reopen Section 106 consultation with our office pursuant to 36 CFR 800.5(d)(1).

If you have any questions regarding our review of this project, please contact Kelly Gragg-Johnson, Environmental Review Program Specialist, at 651-201-3285 or kelly.graggjohnson@state.mn.us.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

cc: Bill Dunn, MN Pollution Control Agency

Figure 14 - DNR Natural Heritage Review

DEPARTMENT OF NATURAL RESOURCES

Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Alexandria Lake and Sanitary District (ALASD) WWTF Expansion

Project Proposer: ALASD

Project Type: Utilities, Sewage Treatment Plant

Project Type Activities: Waterbody, watercourse, streambed impacts (e.g., discharge, runoff, sedimentation, fill, excavation)

TRS: T128 R38 S23, T128 R38 S25, T128 R38 S26

County(s): Douglas

DNR Admin Region(s): Northwest

Reason Requested: State EAW

Project Description: ALASD is currently in the Facility Plan process of expanding the WWTF to treat projected 2045 flows and replace outdated/old equipment. Expansion includes ...

Existing Land Uses: The existing site has an average wet weather design capacity of 4.7 mgd and treats wastewater from a service area that is approximately 100 sq miles. The ...

Landcover / Habitat Impacted: The existing WWTF discharges treated wastewater into Lake Winona, and future expansion of the site will occur within the existing facility boundary. The ...

Waterbodies Affected: Construction for the LS1 forcemain may affect surface water runoff into Lake Winona. Dewatering measures will be implemented during construction to minimize impacts to Lake Winona.

Groundwater Resources Affected: Previous groundwater tests show the groundwater to be approximately 21' below grade. Excavation will not affect the existing groundwater table. The NRCS ...

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	No Comments	No Further Review Required
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	Comments	Recommendations
Federally Listed Species	No Records	Visit IPaC For Federal Review

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

December 30, 2022

Project ID: MCE #2022-00896

Kellie Schaefer
Brown and Caldwell
370 Wabasha St N
St. Paul, MN 55102

RE: Automated Natural Heritage Review of the proposed Alexandria Lake and Sanitary District (ALASD) WWTF Expansion
See Cover Page for location and project details.

Dear Kellie Schaefer,

As requested, the above project has been reviewed for potential effects to rare features. Based on this review, the following rare features may be adversely affected by the proposed project:

Ecologically Significant Area

No ecologically significant areas have been documented in the vicinity of the project.

State-Listed Endangered or Threatened Species

No state-listed endangered or threatened species have been documented in the vicinity of the project.

State-Listed Species of Special Concern

Taxonomic Group	Common Name	Scientific Name	Water Regime	Habitat	Federal Status
Vertebrate Animal	Mudpuppy	Necturus maculosus		Deep Water Zone of Lake, Littoral Zone of Lake, Large Rivers, Medium Rivers and Streams	

- The above table identifies state-listed species of special concern that have been documented in the vicinity of your project. If suitable habitat for any of these species occurs within your project footprint or activity impact area, the project may negatively impact those species. To avoid impacting state-listed species of special concern, the DNR recommends modifying the location of project activities to avoid suitable habitat or modifying the timing of project activities to avoid the presence of the

species. Please visit the DNR Rare Species Guide for more information on the habitat use of these species and recommended measures to avoid or minimize impacts. For further assistance, please contact the appropriate DNR Regional Nongame Specialist or Regional Ecologist. Species-specific comments, if any, appear below.

Federally Listed Species

The Natural Heritage Information System does not contain any records for federally listed species within one mile of the proposed project. However, to ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online Information for Planning and Consultation (IPaC) tool.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

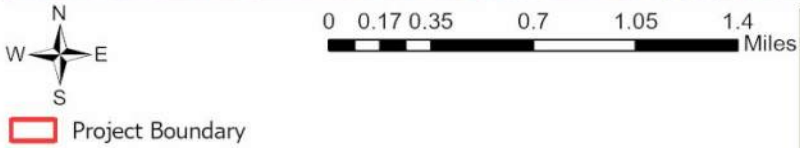
Sincerely,

Jim Drake Jim Drake
Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Links: USFWS Information for Planning and Consultation (IPaC) tool
Information for Planning and Consultation (IPaC) tool
DNR Regional Environmental Assessment Ecologist Contact Info
https://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

xandria Lake and Sanitary District (ALASD) WWTF Expans

Aerial Imagery With Locator Map



Project Boundary

Project Type: Utilities, Sewage Treatment Plant

Project Size (acres): 116.88

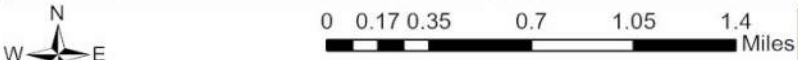
County(s): Douglas

TRS: T128 R38 S23, T128 R38 S25, T128 R38 S26

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA
Earthstar Geographics

xandria Lake and Sanitary District (ALASD) WWTF Expans

USA Topo Basemap With Locator Map



Project Boundary

Project Type: Utilities, Sewage Treatment Plant

Project Size (acres): 116.88

County(s): Douglas

TRS: T128 R38 S23, T128 R38 S25, T128 R38 S26

Esri, NASA, NGA, USGS, FEMA
Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

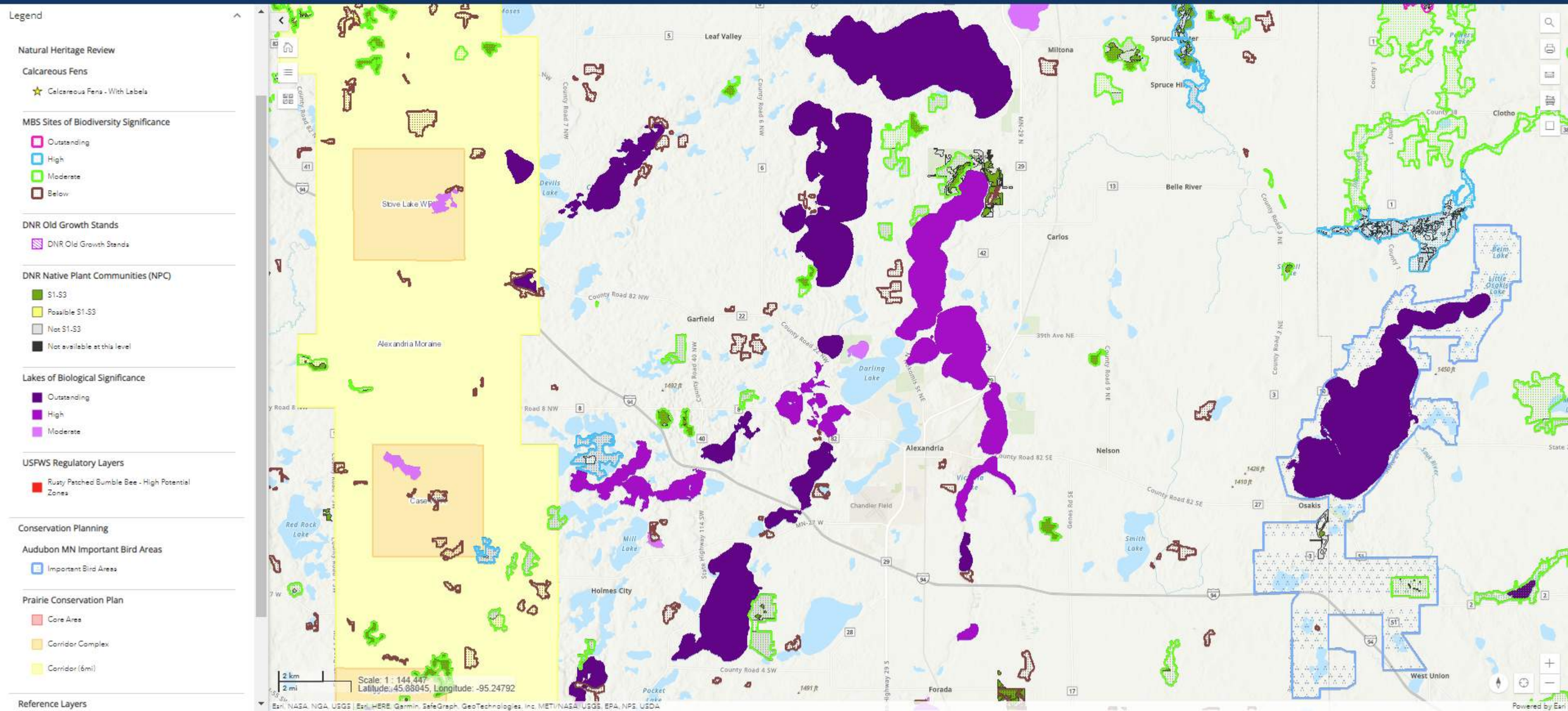

Legend
Natural Heritage Review
Calcareous Fens
Calcareous Fens - With Labels
MBS Sites of Biodiversity Significance
Outstanding
High
Moderate
Below
DNR Old Growth Stands
DNR Old Growth Stands
DNR Native Plant Communities (NPC)
S1-S3
Possible S1-S3
Not S1-S3
Not available at this level
Lakes of Biological Significance
Outstanding
High
Moderate
USFWS Regulatory Layers
Rusty Patched Bumble Bee - High Potential Zones
Conservation Planning
Audubon MN Important Bird Areas
Important Bird Areas
Prairie Conservation Plan
Core Area
Corridor Complex
Corridor (6mi)
Reference Layers
Leaf Valley
Miltona
Spruce Hill
Clotho
Belle River
Carlos
Garfield
Alexandria Moraine
Alexandria
Nelson
Osakis
Holmes City
Forada
West Union
Stove Lake WPA
Darling Lake
Chandler Field
Mill Lake
Smith Lake
Red Rock Lake
Pocket Lake
Little Osakis Lake
Beim Lake
County Road 82 NW
County Road 82 SE
County Road 4 SW
39th Ave NE
MN-27 W
MN-29 N
State Highway 114 SW
State Highway 29 S
Scale: 1 : 144,447
Latitude: 45.88045, Longitude: -95.24792
Esri, NASA, NGA, USGS | Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA
Powered by Esri

Figure 15 - APAC Review

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873

In Reply Refer To:
Project Code: 2023-0029405
Project Name: ALASD WWTF Expansion

December 30, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of "There are no listed species found within the vicinity of the project," then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

This species hibernates in caves or mines only during the winter. In Minnesota and Wisconsin, the hibernation season is considered to be November 1 to March 31. During the active season (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),

- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, please use the northern long-eared bat determination key in IPaC. This tool streamlines consultation under the 2016 rangewide programmatic biological opinion for the 4(d) rule. The key helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. No further review by us is necessary.

Please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the bat by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of northern long-eared bats after the new listing goes into effect this will first need to addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of

Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

Project Summary

Project Code: 2023-0029405
Project Name: ALASD WWTF Expansion
Project Type: Wastewater Facility - Maintenance / Modification
Project Description: Expansion of the ALASD WWTF for 2045 projected flows.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@45.87247105,-95.40940997151793,14z

Counties: Douglas County, Minnesota

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

NAME	BREEDING SEASON
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds May 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee

was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

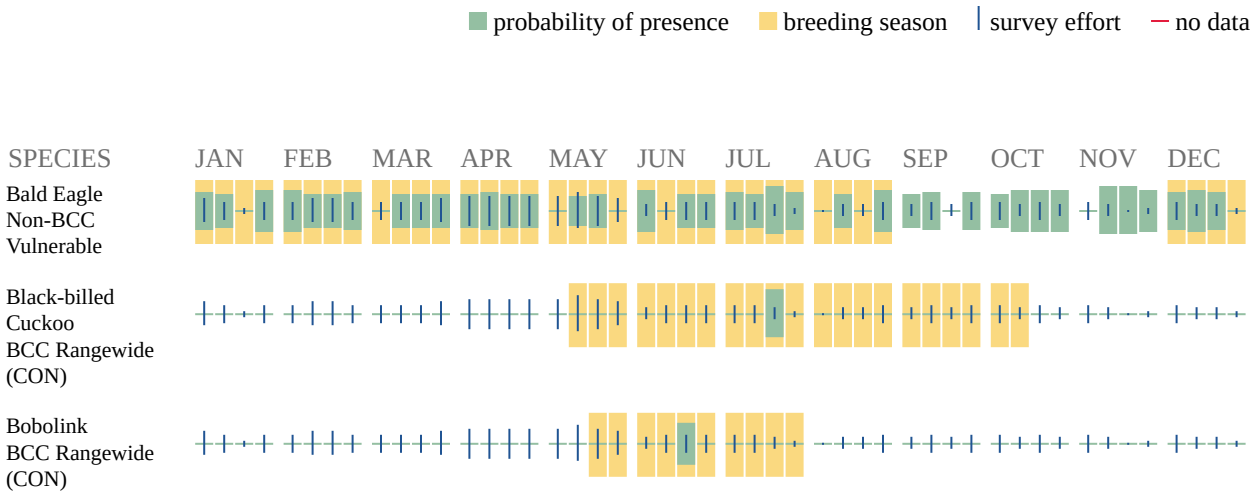
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

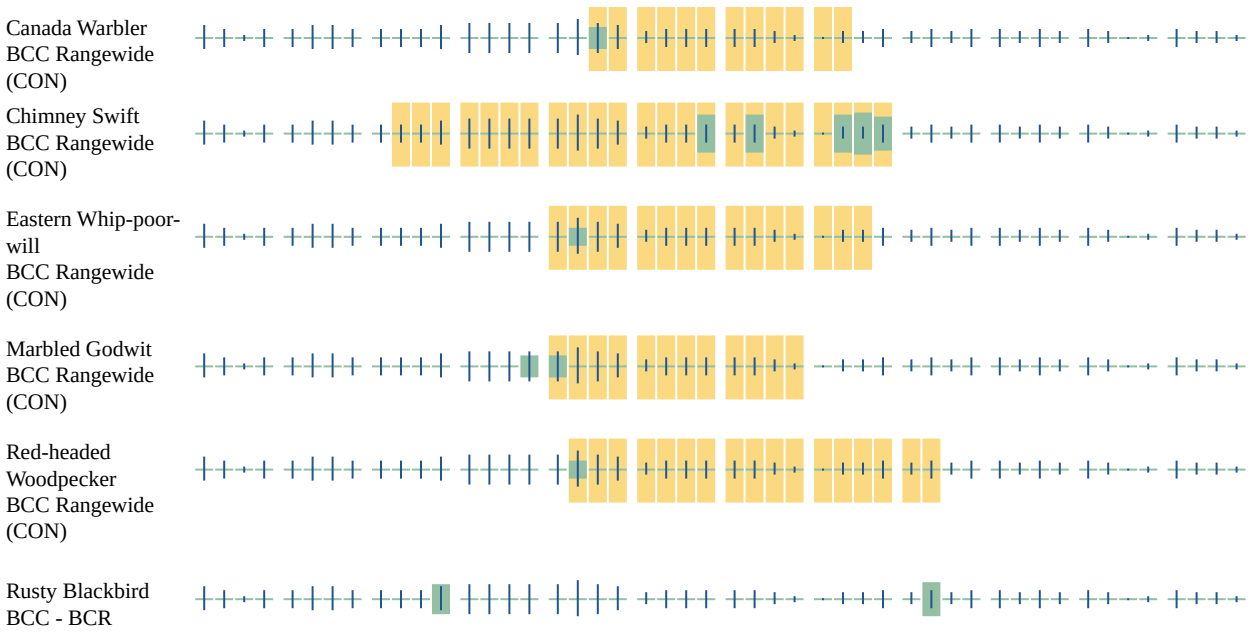
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1Ax
- PEM1C

LAKE

- L2UBH

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A
- PSS1A

FRESHWATER POND

- PUBFx

IPaC User Contact Information

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873

In Reply Refer To:
Project code: 2023-0029405
Project Name: ALASD WWTF Expansion

December 30, 2022

Subject: Consistency letter for the 'ALASD WWTF Expansion' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Kellie Schaefer:

The U.S. Fish and Wildlife Service (Service) received on December 30, 2022 your effects determination for the 'ALASD WWTF Expansion' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Additionally, please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the NLEB by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If

your project may result in incidental take of NLEB after the new listing goes into effect this will first need to be addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

The IPaC-assisted determination for the northern long-eared bat **does not** apply to the following ESA-protected species that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

ALASD WWTF Expansion

2. Description

The following description was provided for the project 'ALASD WWTF Expansion':

> Expansion of the ALASD WWTF for 2045 projected flows.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@45.87247105,-95.40940997151793,14z

Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule
This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   No

2. Will your activity purposefully **Take** northern long-eared bats?

   No

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/media/nleb-roost-tree-and-hibernacula-state-specific-data-links-0.

   Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

6. Will the action involve Tree Removal?

   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type ‘0’ in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type ‘0’ in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type ‘0’ in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type ‘0’ in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

IPaC User Contact Information

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Figure 16 - Notice of Public Hearing for ALASD Facility Plan

P: (320) 762-1135 • F: (320) 762-1108

ALASD
Alexandria Lake Area Sanitary District
Restoring Our Water for a Healthier Natural Environment

2201 Nevada St. • Alexandria, MN 56308

Alexandria Lake Area Sanitary District Public Hearing:

Wastewater Treatment Draft Facility Plan

February 8, 2023
4:30 PM

Alexandria Lake Area Sanitary District Meeting and Training Facility
2201 Nevada Street SW
Alexandria MN 56308

Notice is hereby given that the Alexandria Lake Area Sanitary District (ALASD) will hold a public hearing on the ALASD Wastewater Treatment Draft Facility Plan at 4:30 p.m. on February 8, 2023, at the ALASD Meeting and Training Facility.

ALASD's wastewater treatment facility (WWTF) was constructed from 1976 to 1978. Future regulations require additional treatment to meet permit limits and prevent degradation of receiving waters. Increased residential, commercial, and industrial flow and load to ALASD has caused the facility to operate near capacity. Future growth projections include commercial and industrial growth as well as increased residential population in the ALASD service area. In addition, much of the facility is 45 years old and requires rehabilitation or replacement.

The Draft Facility Plan outlines the issues at the WWTF, various alternatives studied, recommended improvements, and the reasons that support recommendations for the WWTF Improvements and Expansion Project.

The Wastewater Treatment Draft Facility Plan will be available after January 12, 2023, for review on online at alasdistrict.org. A copy of the Wastewater Treatment Draft Facility Plan will also be available for review during normal business hours at: ALASD offices located at 2201 Nevada St. SW., Alexandria, Minnesota.

If you cannot attend the public hearing and would like to submit written comments, please mail or email your comments to:

Attn: Scott Gilbertson, Executive Director
Alexandria Lake Area Sanitary District
2201 Nevada Street SW
Alexandria MN 56308

scott@alasdistrict.org