Pretreatment Replacement Design For:

East Lake Community Center



Project Information: Section 20, Township 47, Range 23 PID# 30-0-032700 36666 State Hwy 65 McGregor, MN 55760 Aitkin County

Septic System Design Completed By: Eric Otte Septic Check 6074 Keystone Road Milaca, MN 56353 Lic # 2624 Phone: 888-983-2447



Project Overview

The existing pretreatment system that serves the East Lake Community Center and the school cafeteria has failed and needs to be upgraded.

Existing Onsite Septic System Description:

The main mound lift station tank and mounds were just upgraded in 2021. The existing Septic, EQ, and Pump Tanks will be reused as a part of this upgrade. The leaking dual wall risers will need to be replaced with Ultra Rib and be sealed, watertight.

Proposed Onsite Septic System Description

Flow Estimates:

The original design had a flow rating of 2900 gallons per day for the community center and school cafeteria. This design is based on an average flow of no more than 3000 gallons per day with an average waste strength of 400 mg/l of BOD.

Loading Estimates:

The Restaurant will increase the waste strength of the effluent at this facility. The strength of the wastewater is estimated at 400 mg/I CBOD based on the estimated use at the facility, and experience with this type of facility. An effluent sample was collected to verify waste strength. See results attached. A pretreatment MBBR devise will be installed to reduce waste strength below level C effluent quality. Loading calculations are shown below:

2900 GPD x 400 mg/l x 8.34 (/1,000,000) = 9.67 lbs/CBOD/day

Proposed System Description:

The existing septic, EQ and pump tanks will be reused in this design and new treatment tanks will be added. Existing pumps and panels may be reused.

New:

- Core drill a 4" hole in the existing EQ tank compartment wall close to the floor to create a larger EQ volume.
- Remove the existing valve structure and re plumb using ball check valves in the EQ pump tank.
- Replace all existing dual wall risers with Ultra Rib Riser adhered to the tank in a watertight fashion.
- Plumb a single 2" forcemain into the new treatment tank.
- Install a W1665 MR treatment tank equipped with an Alpha Onsite MBBR.
- Install a W1250/750 MR two compartment clarifier tank with a sludge return pump and 2" return line back to the first septic tank.
- 24" insulated manhole covers to grade.
- Ultra-rib riser attached with ADH 100 or two-part epoxy
- All manholes will need to be installed 2" or greater above grade for ease of servicing.

Water supply / wells:

The deep well is more than 100 feet from any of the septic components.

Additional Notes:

Keep all vehicles and construction equipment off septic area. Rutting and/or compacting the soil will change the percolation rates and may lead to system failure.

Owner to verify all property lines.

Installer to verify all elevations, dimensions, and ensure proper fall to pipes.

Establish turf to prevent erosion and freezing. Final restoration includes seeding and straw mulch over the disturbed areas.

Each tank is to be pumped through the maintenance cover when serviced. Do not pump through inspection pipes.

Owner is responsible for all costs involved in servicing, monitoring, and mitigating the system.

All construction to be performed in accordance with MN Rule 7080 and approved by the Band.

Maintenance Requirements

Semi-Annual maintenance is recommended for this system. Level C treatment was used in this design. Below is a list of maintenance requirements to be completed by the service provider, maintainer, and owner.

Owner requirements:

- Hire a licensed service provider to complete the tasks below and maintain compliance with the operating permit.
- The owner is to maintain compliance with the operating permit at all times or follow the mitigation plan to make changes to get back into compliance if operating permit limits are not being met.
- Record water meter readings daily and provide this information to the service provider.
- Maintain vegetation around tanks and mound systems. It is suggested the sites be mowed and trimmed twice per year.
- Update the service provider, designer, and county if changes in water use are expected such as adding food service or expansion of the building.
- Maintain access points for service equipment to reach tanks and other components.

Maintainer requirements:

- Pump and clean tanks when solids levels reach 33% of tank capacity.
- Pump and clean lift tanks when sludge levels exceed 4" in depth.
- Inspect tank integrity when pumping to ensure tank compliance.
- Clean baffles and effluent screens at each tank pumping.
- Report any unsafe conditions to owner and service provider.
- Report and note any issues such as infiltration, seepage, or other non-compliance issues.
- Follow local and state regulations when disposing of septage.

Service Provider requirements:

- Use the maintenance checklist below as a reference for service to be completed on the system at which frequency.
- Adjust or recommend changes in maintenance tasks and frequency based on operational results.
- Schedule or complete tank maintenance pumping when solids reach critical levels.
- Follow the County operating permit and sampling requirements. Send maintenance reports to the County.
- For detailed maintenance tasks or troubleshooting information, refer to the attached installation and operation & maintenance manual provided the manufacture.

Maintenance requirements:

| Location | Description | Frequency |
|--------------|--|---------------|
| Septic tanks | Inspect manholes for infiltration | Semi-Annually |
| Septic tanks | Inspect inlet and outlet for infiltration | Semi-Annually |
| Septic tanks | Inspect and clean effluent filters | Semi-Annually |
| Septic tanks | Sample sludge and scum levels | Semi-Annually |
| Septic tanks | Pump tanks when solids level exceeds 33% of tank | As needed |
| Septic tanks | Inspect baffles, effluent screens and tank integrity | Semi-Annually |

| Location | Description | Frequency |
|---------------|--|---------------|
| Lift Stations | Inspect manholes for infiltration | Semi-Annually |
| Lift Stations | Inspect inlet and outlet for infiltration | Semi-Annually |
| Lift Stations | Inspect pumps and floats for proper operation | Semi-Annually |
| Lift Stations | Inspect panel and alarm system for proper | Semi-Annually |
| | operation | |
| Lift Stations | Record cycle counters and elapsed timer meters | Weekly |
| Lift Stations | Sample sludge and scum levels | Semi-Annually |
| Lift Stations | Pump tanks when solids level exceeds 6" in depth | As needed |
| Lift Stations | Sample effluent CBOD, TSS | As needed |

| Component D | Component Description: Alpha Onsite MBBR Aerobic Tanks | | | | | | |
|--------------|--|---------------|--|--|--|--|--|
| Location | Description | Frequency | | | | | |
| Pretreatment | Inspect effluent quality and odor. Effluent should | Semi-Annually | | | | | |
| tank | be clear and should have a musty odor. | - | | | | | |
| Pretreatment | Adjust blower based on effluent results. | Semi-Annually | | | | | |
| tank | | | | | | | |
| Pretreatment | Clean or replace air filter on blower. | Semi-Annually | | | | | |
| tank | | | | | | | |
| Pretreatment | Record pressure reading on blower. | Semi-Annually | | | | | |
| tank | | | | | | | |
| Pretreatment | Inspect and clean media retention sieve | Semi-Annually | | | | | |
| tank | | | | | | | |
| Pretreatment | Inspect media for plugging | Semi-Annually | | | | | |
| tank | | | | | | | |
| Pretreatment | Inspect manholes for infiltration | Semi-Annually | | | | | |
| tank | | | | | | | |
| Manhole | Inspect return pump for proper operation | Semi-Annually | | | | | |
| Panel | Inspect panel and alarm system for proper | Semi-Annually | | | | | |
| | operation | | | | | | |
| Panel | Record cycle counters and/or elapsed timer | Semi-Annually | | | | | |
| | meters. | | | | | | |
| Panel | Adjust timer settings based on treatment results | As needed | | | | | |
| Tank | IDO NOT PUMP THIS TANK!! | | | | | | |
| pumping not | | | | | | | |
| required | | | | | | | |

| Location | Description | Frequency |
|------------|--------------------------------|---------------|
| Drainfield | Inspect for ponding or seepage | Semi-Annually |
| Drainfield | Mow the drainfield area | As Needed |
| Drainfield | Clean lateral lines | As Needed |

Mitigation:

| Problem | Action | Mitigation Steps |
|--|---|---|
| Rockbeds ponding | Verify flow and effluent results are with in permit limits. Verify equal distribution in bed dosing. Inspect all beds to determine if it's isolated to one area or all beds. | If flow cannot be accepted by the beds, pump and haul excess effluent. Complete pump calibration to verify timer settings are correct. If dosing is not equal, adjust timer settings to each zone |
| Seepage below beds | Verify dosing volumes and equal distribution Inspect all beds to determine if it's isolated to one area or in all beds. Verify pump operation Review flow data Inspect piezometer levels | Adjust timer settings to reduce flow entering the bed with seepage. Complete pump calibration to verify timer settings are correct. Shut down some bed zones to reduce seepage by closing valves of shutting pumps down in panel. |
| Treatment levels not meeting operating permit limits | Verify flow, influent, and effluent results are with in permit limits. Verify dosing volumes from EQ tank to treatment tank. Adjust sludge return pump settings. Verify blower and aeration network are working properly | If treatment levels cannot be met, expand the treatment system by adding media, or adding more tankage Adjust dosing tank match long term daily flow averages as close as possible. Sample influent from EQ tank to verify loading. Sample dissolved oxygen and pH in EQ tank and Treatment tank. Check blower air filter, amperage and pressure. |
| Flow limit exceeded | Inspect for signs of infiltration in all tanks Inspect building plumbing for leak fixtures or toilets. Discuss water use patterns with the owner or mgmt. | Adjust timer settings within the permit limits and operating permit limits Pump and haul excess flow. |



Preliminary Evaluation Worksheet



| 1. Contact | Information | | | | | | V | 04.01.2021 |
|--|---|--------------------|--------------------------|-------------|-----------------------|-------------------------|----------------|------------------------|
| Proper | Property Owner/Client: Mille Lacs Band Date Completed: 5/20/2025 | | | | | | | |
| Site Address: 36666 State Highway 65, McGregor, MN 55760 | | | | | | Project ID: | | |
| | Email: carla.dunkley@millelacsband.com | | | | | | Phone: | 320-532-7429 |
| | Mailing Address: | | - | | | | Alt Phone: | |
| | egal Description: | | | | | | | |
| | | 20 0 02270 | 20 | | | T)//D: | | |
| 2 Flow an | | Joformation | | SEC: | | TWP: | | KNG: |
| Z. Flow and | d General System | Information | 1 | | | | | |
| A. Clic Pro P | ent-Provided Infor oject Type: [Project Use:] Res | mation New Constru | uction] Other Establ | Replacer | nent Schoo | Expansion [(with cafet | eria, gym, a | Repair and showers) |
| Resi | idential use: # | Bedrooms: | | Dwelling S | q.ft.: | U | Infinished So | q. Ft.: |
| | | # Adults: | | # Chil | dren: | | # Teena | agers: |
| | In-home busin | ess (Y/N): | | If yes, des | cribe: | | | |
| Addi | Garbage Disposal/Grinder Dishwasher Hot Tub* Water-using devices: Sewage pump in basement Water Softener* Sump Pump* (check all that apply) Large Bathtub >40 gallons Iron Filter* Self-Cleaning Humidifier* Clothes Washing Machine High Eff. Furnace* Other: * * Clear water source - should not go into system | | | | | | | |
| Anti | icipated non-dome | stic waste: | Pretreatm | nent system | replacemen | t to reduce of | organic load | ing |
| The abo | ove is complete & | accurate: | | | | | | |
| B Do | signor dotormino | d flow Infor | mation | Attach addi | Client sig | gnature & da | te | |
| D. De | | | 2000 | | Anticin | atod Wasto | | bor Est - HSW |
| | De | | 2900 | | | | | |
| | | BOD: | 400 | mg/L ISS | 100 | mg/L C | nt & Grease | 15 mg/L |
| 3. Prelimina | ry Site Informatio | n | | | | | | |
| A. Water Su | | | | | | | | |
| # | Descriptio | on | Mn. ID# | Well Depth | Casing Depth (ft.) | Confining Laver | STA Setback | Source |
| 1 | | | | (100) | 2000 (10) | | Jetbuch | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| | Additional Well In | formation: | | | | | | |

| UNIVERSITY OF MINNESOTA ONSITE SEWAGE TREATMENT PROGRAM | Preliminary Evaluation Worksheet | OLLUTIO | | |
|---|--|---------|--|--|
| Sit | te within 200' of noncommunity transient well (Y/N) No Yes, source: | | | |
| Site wit | thin a drinking water supply management area (Y/N) No Yes, source: | | | |
| Site in Well Head | d Protection inner wellhead management zone (Y/N) No Yes, source: | | | |
| Buried water | r supply pipes within 50 ft of proposed system (Y/N) No | | | |
| B. Site loca | ated in a shoreland district/area? No Yes, name: | | | |
| | Elevation of ordinary high water level: NA ft Source: | | | |
| Classific | cation: Tank Setback: ft. STA Setbk: | ft. | | |
| C. Site loca | ated in a floodplain? No Yes, Type(s): N/ | A | | |
| | Floodplain designation/elevation (10 Year): N/A ft Source: N/ | A | | |
| | Floodplain designation/elevation (100 Year): N/A ft Source: N/ | A | | |
| D. Property | ry Line Id / Source: Owner Survey 🖓 County GIS Plat Map Other: | | | |
| E. ID distar | nce of relevant setbacks on map: Water Easements Well(s) | | | |
| | Building(s) Property Lines OHWL Other: | | | |
| 4. Preliminary S | Soil Profile Information From Web Soil Survey (attach map & description) | | | |
| | Map Units: TANKS ONLY, EXISTING STA Slope Range: | % | | |
| List | t landforms: | | | |
| Landform | n position(s): | | | |
| Paren | nt materials: | | | |
| | Depth to Bedrock/Restrictive Feature:in Depth to Watertable: | in | | |
| | Septic Tank Absorption Field- At-grade: | | | |
| Map Unit Ratings | Septic Tank Absorption Field- Mound: | | | |
| | Septic Tank Absorption Field- Trench: | | | |
| 5. Local Govern | ment Unit Information | | | |
| | Name of LGU: Mille Lacs Band | | | |
| | LGU Contact: Carla Dunkley | | | |
| | LGU-specific setbacks: | | | |
| LGU-specific design requirements: | | | | |
| LGU-specific ins | stallation requirements: | | | |
| Notes: | | | | |

| ALPHA MAXX | | | | |
|-------------------|-------------------|--|--|--|
| MODEL: | ALPHA MAXX 10.0 | | | |
| MAX FLOW: | 3000 GPD | | | |
| MAX BOD LOAD: | 17.0 LBS./DAY | | | |
| REMOVAL RATE: | UP TO 98% | | | |
| TREATMENT VOLUME: | 1600 GAL. | | | |
| BLOWER SIZE: | 2.0 HP | | | |
| VOLTAGE: | 230 V | | | |
| FLA: | 9.9 AMPS | | | |
| SCFM/PSI: | 55 CFM / 2.06 PSI | | | |
| REACTOR FILL: | 40% | | | |
| DIFFUSERS: | DF-26-3-8 | | | |

TO DELIVERY ONSITE. THE INSTALLER IS RESPONSIBLE FOR

ALL PIPING OUTSIDE THE TANK. 2. THE TANK SHALL BE BEDDED WITH 4" MIN. AND

BACKFILLED UP THE THE CENTER SEAM WITH GRANULAR AGGREGATE. SEE TANK SPECIFICATIONS AND INSTALLATION MANUAL FOR ADDITIONAL INFORMATION. MAXIMUM BURIAL DEPTH IS 48 in., MINIMUM BURIAL DEPTH S 6 in.

IS 6 In. 4. A POLYLOK PL 625 EFFLUENT FILTER IS REQUIRED FOR THE OUTLET OF THE CLARIFIER TANK AND WILL BE SUPPLIED BY THE MANUFACTURE. EXTEND A 1" T HANDLE TO 12" FROM FINAL GRADE FOR REMOVAL AND SERVICE OF THE FII TER

5. PLUMB THE AIR LIFT RETURN PUMP USING A 2" GRAVITY LINE WITH 2% MIN. FALL TO THE INLET OF THE SEPTIC TANK

ABOVE THE NORMAL OPERATING LEVEL OF THE TANK. 7. THE BLOWER AND ENCLOSURE FOR THE ALPHA MAXX

SYSTEM IS TO BE INSTALLED WITHIN 50 FEET OF THE TANK LOCATION.

WEXCO ENVIRONMENTAL 6074 KEYSTONE ROAD MILACA, MN 56353 (800) 983-2447 ALPHA MAXX 11.0 TANK CONFIGURATION

awn by: BRK





HIGH STRENGTH WASTE TREATMENT



1. EFFLUENT FILTER**2.** AIR DIFFUSER**3.** BLOWER & HOUSING**4.** MEDIA SEIVE**5.** AIR LIFT SLUDGE RETURN PUMP**6.** SLUDGE RETURN LINE**7.** DOSE PUMP(S)

Gravity flow systems are ideal for small or consistent flow applications due to their simplicity. An air lift return pump recycles effluent to create a consistent flow through the system while improving effluent quality.



Flow equalization features a tank that holds wastewater for a specific period of time. A timer controlled pump doses a specific amount of the wastewater into the treatment system each day, providing a steady feed rate and ensuring optimal treatment.

THE BENEFITS OF HIGH STRENGTH WASTE TREATMENT

Small footprint.

Quick, economical installation.

Large surface area of biofilm carriers compared to other treatment technologies. (Means you can do more

in a smaller space)



Biofilm growth on media surface Retrofit capabilities. (in existing tanks)

Can be designed for high strength and variable BOD loading.

Self-regulating biofilm ensures stability under shock loading conditions. Operator friendly, and virtually maintenance free.

Passive denite with return sludge pump.

Can pretreat ahead of existing treatment if loading is too high.

THE **SMARTER** TREATMENT SOLUTION

ALPHAMAXX

The Alpha Maxx MBBR (moving bed bioreactor) utilizes small biofilm carriers which provide a stable home for large populations of bacteria to grown and treat the wastewater. That, coupled with time tested aeration equipment, creates an **efficient treatment process** which can be used in most applications.

WHY USE MBBR?

Can work for small flows (hundreds of gallons per day) and **easily scales** to large flows (million gallons per day).

Flexible install,

below ground fiberglass or concrete tanks, above ground steel, concrete, or fiberglass tanks. High density of bacterial growth due to large surface area of media.

Expandable if flows or loading increases.

Add pretreatment to or expand existing systems without tank installation.

Works well in **cold climates**.

SIMPLE. EFFICIENT. CLEAN WATER.



Call

320.983.2447 WEXCOENVIRO.COM

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W1250/750-MR TANK SPECIFICATIONS -POUR: ц. DIMENSIONS: WALL: 2 1/2" BOTTOM: 3" COVER: 6" DATE: MANHOLE: 24" I.D. PRECAST CONCRETE RISER HEIGHT: 66" LENGTH: 12'-11" REV. WIDTH: 7'-2" BELOW INLET: 53" °, LIQUID LEVEL: 48" WEIGHT: BOTTOM 8,740 LBS. 00/00/00 WCP П COVER 6,120 LBS. SCALE: 1/4" ВҮ: INLET AND OUTLET: DRAWN 4" CAST-A-SEAL BOOT OR EQUAL GASKET INLET AND OUTLET BAFFLE AND FILTER: WISCONSIN, SEE DETAIL #10 (OTHER STATES SEE CHART) LIQUID CAPACITY: 27.66 GAL/IN (SEPTIC) 22 **8456** 16.12 GAL/IN (PUMP) LOADING DESIGN: 8'-0" UNSATURATED SOIL TANK CAN BE USED AS: SEPTIC/SEPTIC, SEPTIC/SIPHON, OR SEPTIC/SIPHON HWY 1 800-COVER: MIX DESIGN #8 (NO FIBER) TANK: MIX DESIGN #10 (STRUCTURAL FIBER) CUSTOMIZED TANKS: FOR CUSTOM TANKS CONTACT WIESER CONCRETE

POST-POUR

DATE:

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| REVIEWED BY REVIEW DATE | 1250-750-1 | EPTIC MANU |
|------------------------------------|------------|------------|
| DRAWINGS SUBMITTED FOR APPROVAL | 3 | S |
| APPROVED BY: | SHE | ET NO |
| APPROVAL DATE: | 1 | |
| PRODUCTS NEEDED BY: | | OF 1 |

TANKS ARE MANUFACTURED TO MEET OR EXCEED ASTM C-1227 REQUIREMENTS



Analysis Report

May 06, 2025

REPORT TO:

Septic Check, Inc.

6074 Keystone Road Milaca MN 56353

INVOICE TO:

Septic Check, Inc. Brian 6074 Keystone Road Milaca MN 56353-

| Date Rcvd-Brnd: | 4/29/2025 | Sampled By: | Eric Otte | LOCATION: |
|-----------------|-----------|--------------|------------|-----------|
| Time Rcvd-Brnd: | 16:43 | Sample Type: | WW | East Lake |
| | | Recv Temp°C: | 4.8 on ice | |

| SITE / ANALYTE | Sample Date/Time | Analyzed Value | Units | Reporting Limit | Analytical Method | Analysis Date/Time | Analyst | Code # |
|---------------------------------|---------------------|-------------------|-------|--------------------|---------------------------|-----------------------|---------|--------|
| East Lake Inf | 4/29/2025 @ 12 | :30 | | | | | | |
| Biochemical Oxygen Demand (BOD) |) | 199 | mg/L | 2 | HACH 10360 REV 1.2 (2011) | 4/30/25 13:52 | SB | 108750 |
| Residue-Nonfilterable (TSS) | | 44 | mg/L | 1 | USGS I-3765-85 | 5/1/25 11:24 | BS | 108750 |

Approved By:

Septania Kund

Date Approved: 5/6/2025

Stephanie Kuesel, Laboratory Manager

A.W. Research Laboratories, Inc. is accredited by the MNELAP and follows approved methods and procedures. MN State Laboratory ID: 027-035-135 and EPA Lab Code: MN00098. All data generated using non-accredited methods noted as -NC, and all analytes for which accreditation is unavailable -NA. The results above relate only to the samples tested. This report must not be reproduced, except in full, without the written approval of the laboratory. We appreciate your feedback, please email us at awlab@awlab.com with questions or comments. Thank you!

~End of Analysis Report~





Looking north from pump tank



Valves to be removed and replumbed in the EQ pump tank.



Looking south from septic tank



Power Source Panel