Community Development
REQUEST FOR PROPOSAL

OWNER: **MILLE LACS BAND OF OJIBWE**
43408 OODENA DRIVE
ONAMIA, MN 56359

DATE ISSUED: August 31, 2017

BID DATE: September 20, 2017

PROJECT: 40243 Beach Rd, Wahkon On-Site Septic System Replacement

TO: Qualified Septic Contractors

THIS IS NOT A CHANGE ORDER NOR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED HEREIN.

The Mille Lacs Band of Ojibwe, Community Development office will be accepting sealed lump sum bids for the installation of a new on-site septic system; and abandonment of the existing system at 40243 Beach Rd, Wahkon. Bids will be due Wednesday September 20, 2017 at 3:00 PM. Bids received will be opened and qualified by the Mille Lacs Band of Ojibwe on Thursday September 21, 2017 at 8:30 AM.

A mandatory pre-bid site visit for this project will be held at 4pm on Thursday, September 7th. Directions to the site: Turn north onto Galloway Rd. Follow Galloway Rd .6 miles. Then turn left onto Beach Rd. Follow Beach Rd to "y". Then turn left and continue to 40243.

General Notes:

1. It is the Contractors responsibility to identify any and all discrepancies in the scope of work, not meeting Industry Standards or that which is inconsistent with the International Building Code (IBC), and Mille Lacs Band of Ojibwe 2016 MLB Project Specification Book.
2. All electrical wiring, apparatus and equipment for electric light, heat and power, technology circuits or systems shall comply with the rules of the Department of Commerce or the Department of Labor and Industry, as applicable, and be installed in conformity with accepted standards of construction for safety to life and property.
3. Contractor must reconnect all utilities, service panel or service feed. Also includes gas, propane. Include such equipment or materials identified in the pre-bid conference.
4. Contractor will secure all permits and fees.
5. Contractor is responsible for a thorough investigation of the scope of work.
6. Contractor will repair any damage to the property or structure created by the scope of work.
7. Contractor shall be responsible for all debris removal related to all work performed under this work scope.
8. NO WORK SHALL BE PERFORMED UNTIL ALL REQUIRED PERMITS HAVE BEEN ISSUED AND COPIES IN THE POSSESSION OF THE PROJECT COORDINATOR AND /OR MILLE LACS BAND BUILDING OFFICIAL.

COMMUNITY DEVELOPMENT WILL, TO THE GREATEST EXTENT FEASIBLE, GIVE PREFERENCE IN THE AWARD OF CONTRACT TO INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES.

Work Scope:

2016 MLB Spec Book, MN Chapter 7080 and Approved Septic Design by Septic Check.

Contractor shall provide all equipment, materials and labor to complete the work described or referenced in this rfp.

1. Replace on-site septic system per the approved septic design provided by Septic Check dated 8/7/2017. Contractor shall ensure complete and functional system.
2. Contractor will be responsible for having the existing tank and pump tank pumped by a licensed Maintainer; and crushing both. Contractor shall complete a Tank Abandonment Reporting Form, which shall be provided to the MLBO along with copies of the paid pumping invoices. Contractor shall assume both tanks to be 1,500 gallons each.
3. Contractor may utilize some of the existing system's materials for cover of the new system provided said materials are dry. MLB DNR inspector must give approval before any materials can be reused in construction of the new septic system. No rock nor wet materials will be permitted for reuse.
4. Contractor shall provide complete removal and off-site disposal of all materials from the old mound, which aren't approved for reuse. Contractor shall provide black dirt and seeding to restore grade and grass cover for old mound location.
5. Contractor shall be responsible for all required permitting and inspections through Mille Lacs County and the MLB DNR. Contractor shall submit to the Owner copies of permits and inspections. Contact Ryan Rupp for information on MLB DNR procedures at (320) 532-7442 or via email at Ryan.Rupp@millelacsband.com
6. Contractor shall provide an As-Built System drawing for submission to MLBO and permitting authority.
7. Contractor will not receive final payment until a Certificate of Compliance has been received from Mille Lacs County; MLB DNR completes a successful final inspection of the system; and Owner has been supplied with full lien waivers for all subcontractors and suppliers.
8. Contractor is responsible for cutting vegetation, brush and trees as required to install the system. Trees 6" in or larger DBH, shall be cut and left on site for MLBO DNR to collect. Branches, and brush shall be chipped on site. Contractor shall follow proper MN Chapter 7080 tree removal procedure, keeping stumps in place and keeping all traffic off the designated mound area. Contractor shall be responsible for the cost of any: compaction testing; re-design fees; or additional costs associated with system redesign or relocation; if these expenses are incurred due to contractor or subcontractor damaging the mound location.
9. Contractor shall be responsible for trenching the electric to the new pump tank.
10. Contractor shall be responsible for completing the alarm hook-up to the home, including trenching to home and making electrical connection for the alarm.
11. Contractor shall provide and install SJE Rhombus AB Duo alarm.
12. Contractor will be responsible for all yard repairs caused by trenching and system installation, including grading, black dirt cover and seeding. If system is installed too late in the season to establish full grass cover prior to freeze-up, contractor shall provide full hay cover of all new system components.
13. Also, provide and install an event counter along side the pump control box.
14. For bids totaling $25,000 or more, .5% TERO tax fee shall be included in the base bid and paid to the TERO office prior to receipt of final contract payment.

Specified Product Substitutions: No substitutions will not be allowed on products specified within the design. Only if the contractor receives written pre-approval from the Designer, Septic Check, can any approved equal product be installed. Contractor will be responsible for cost of design change fee, if applicable for product substitution approval. Said product substitution written pre-approval must be supplied to the Owner and MLB DNR inspector prior to installation.

Contacts:

Interested bidders shall contact Carla Dunkley, Project Management Compliance Officer at 320-532-7429 or by E-mail at carla.dunkley@millelacsband.com to be

included on the bidder's list in the event that any addendums are issued for this project.

Mobilization:

1. The Contractor shall be capable of mobilizing his equipment and crews within seven days of the receipt of Notice to Proceed.
2. Contractor shall provide means and methods for all building phases of construction.

COMMUNITY DEVELOPMENT/PROJECT MANAGEMENT RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS FOR ANY REASON.

Bidding notes:

1. Submit proposal in lump sum (supply and install), not to exceed amount
2. All Contractors (including subcontractors) must comply with Davis Bacon wage requirements.
3. All Contractors must provide the following along with their bid submittal:
    a. Completed and signed MLB Community Development Construction Bid Form
    b. A copy of Current MLB Vendor's License (or a copy of the submitted application)
    c. A copy of Current Insurance Certificate
    d. A copy of Subcontractor/Material Supplier list
    e. A copy of valid State of Minnesota Contractor's License (if applicable)
    f. A copy of Authorized Signature Sheet (submitted with first bid submittal)
4. All Contractors must comply with all Mille Lacs Band of Ojibwe American Indian Employment requirements (see 18 MLBSA § 5). Contact Craig Hansen at (320) 532-4778.

All proposals MUST be mailed and labeled as follows:

Mille Lacs Band of Ojibwe
Commissioner of Community Development
Sealed bid: Women's Shelter Septic Replacement
P.O. Box 509
Onamia, MN 56359

**Please note that the bids must be submitted via mail to the P.O. Box. FedEx and UPS will not deliver to a P.O. Box and the Onamia post office will not accept hand delivered items. Please plan accordingly to ensure the timely receipt of your bid submittal. **

****The Band reserves the right to reject any bid that it is unable to collect at the Onamia post office by the bid deadline date and time, provided that the Band has made diligent and reasonable efforts to collect the bid. The Band reserves this right even in the event that the bid has been postmarked before the deadline.**

PROPOSALS NOT SUBMITTED IN THIS MANNER WILL BE REJECTED.

Licensing:

1. Firms must be licensed with the Mille Lacs Band of Ojibwe. A copy of this license (or the license application) must accompany each bid. Licensing process can take several weeks. If you are not currently licensed with the MLBO, please submit a copy of your license application along with your proposal. Contact Jacquelyn Smith at (320) 532-8240 or via email at JSmith@mlcorporateventures.com with questions regarding licensing and for the license application.
2. Contractors must be MN licensed septic installers.

Permit and Contractor Requirements:

Permits: Contractors are responsible to attain all necessary permits for all work, including Mille Lacs Band of Ojibwe (MLBO) Permits.

Bonding Requirements: In accordance with 2016 MLB Project Specification Book.

MLBSA Section 17 Procurement Statue Ordinance 03-06 states the following:

Section 17. Bonding

A. For all Band funded residential construction projects, a performance bond is required for contracts in excess of $50,000.00. The performance bond shall be at a minimum twenty (20%) percent of the contract price, but not in excess of $500,000.00.

SECTION II – BIDDING FORMS

Bidding Requirements and Contract Forms

COMMUNITY DEVELOPMENT
PROJECT MANAGEMENT

FY 2016 CONSTRUCTION BID FORM
REQUIRED FOR ALL BIDS

FIRM NAME: _____

JOB/PROJECT: 40243 Beach Rd, Wahkon Septic Replacement

LUMP SUM PRICE:

_____ $_____
(Written Value) (Dollar Amount)

ALTERNATE #1: (IF APPLICABLE):

_____ $_____
(Written Value) (Dollar Amount)

ALTERNATE #2 (IF APPLICABLE):

_____ $_____
(Written Value) (Dollar Amount)

Acknowledgement of Addendum(s): 1) _____ **date 2)** _____ **date 3)** _____ **date**

BID GUARANTEE PERIOD:
I agree to hold this bid open for a period of **90 days** after the bid opening. If this bid is accepted I agree to execute a Contract and/or a Purchase Order with the Mille Lacs Band of Ojibwe along with furnishing all required bonding (if required) and insurances.

TERO COMPLIANCE:
I understand that this company, its subcontractors and all employees performing work on this project will be expected to comply with all Mille Lacs Band TERO Compliance Regulations. Upon being informed that I will be awarded a contract for this project, I will submit all required TERO Compliance Plans directly to the MLB TERO Office for review and approval.

Acknowledgement of TERO Compliance: _____

ATTACHMENTS REQUIRED: Failure to provide any of these attachments will result in bid disqualification.

- MLB BID FORM (MUST BE SIGNED)
- MLBO VENDOR LICENSE
- COPY OF CURRENT INSURANCES
- LETTER FROM BONDING SURETY (If required)
- COPY OF MINNESOTA CONTRACTOR'S LICENSE (if applicable)
- SUB-CONTRACTOR LISTS (Include values)

NAME: _____ **TITLE:** _____

SIGNATURE: _____ **DATE:** _____

FIRM NAME: _____ **TELEPHONE:** _____

ADDRESS: _____

EMAIL ADDRESS: _____

SEPTIC CHECK

EXPERT SERVICE. LASTING VALUE. CLEAN WATER

INDIVIDUAL SEWAGE SYSTEM DESIGN SUMMARY

Property Owner: Mille Lacs Band of Ojibwe
Phone: 320-630-2638
Address: 40243 Beach Road
Township: South Harbor
City: Wahkon Zip: 56386
County: Mille Lacs

DESIGN USAGE

Single Family Home ____ Other Group Home
Number of Potential Bedrooms 30 Tenants
Garbage Disposal no
Sewage Lift Pump no

SITE CHARACTERISTICS

Soil type Fine Sandy Loam
Hydraulic Loading 0.78 GPD/ft2
Depth to restrictive layer 0"

DUPLEX PUMP INFORMATION

Pump GPM & TDH 60 GPM 29.4 TDH
Cycles per day 4 each
Gallons per cycle 160 gallons each
Perforation size & spacing ¼" every three feet
Number, spacing, & diameter of laterals 3 – 2" laterals every 3'
Forcemain Size 2"

CAPACITIES

Daily Water Use 1350 Est ____ Calc X
Septic Tank Capacity 5000 gallons
Pump Tank Capacity 2500 gallons

MOUND SYSTEM

Dimension of Rock Base (2) 10' by 57'
Depth of Rock Below Pipe 9"
Dimensions of Mound (2) 53.5' by 99.8'
% Slope of Soil Under Mound 6%
Upslope Dike Width 15.3'
Downslope Dike Width 28.1'
Sideslope Dike Width 21.4'

TRENCH SYSTEM

Type of trench ____
Maximum Depth of trench ____
Square Feet of bed Required ____
Square Feet of bed Proposed ____
Lineal Feet of bed Proposed ____

APPROVAL

By _____ Date 8/7/2017
Travis Johnson License #2624
See additional information sheet if checked ☒

Septic System Design
Additional Information

Property Owner: Mille Lacs Band of Ojibwe

Description of Wastewater Treatment and Dispersal System

This design is to replace an existing system. The current system is not large enough to handle the facilities flows and needs to be replaced. The existing tanks will not be reused in this design. They will need to be pumped, cleaned, and properly abandon.

The design is for a temporary housing facility for woman and children. They currently house 24 tenants but would like to increase this in the future to 30 tenants. The MPCA flow determinations for a rooming house are 45 gallons a day per tenant. This will require a design flow of 1350 gallons per day. Actual flows are anticipated to be less than half of this. Time dosing will be used as a precautionary measure in the event of a leaky faucet or abnormally high use to assure the mound systems do not get over loaded.

The mound system will be split into two 570 ft2 beds that will be time dosed with dual alternating pumps. Each mound will be dosed four times a day at 160 gallons per dose. The mounds are located in a heavily forested area; tree removal must be done with tracked equipment to prevent compaction. All trees will need to be cut down and stumps are to be left in the ground cut just above grade.

It is highly recommended that the systems effluent be tested once it is in operation. It is crucial that the CBOD be no higher than 125 mg/l. In the event the samples come back high, this system was designed to easily add a MBBR (moving bed bio reactor) into the second 2500 gallon septic tank. The MBBR is a high strength waste treatment product that is registered in the state of Minnesota. This would change the system from a type III to a type IV system and would require an operating permit. If test samples come back higher than 125 mg/l and pretreatment is not installed, the systems life expectancy will decrease significantly.

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.

Elevations are referenced to Bench Mark on the driveway (white spray painted X), see map.

Installer to verify all elevations, dimensions, and ensure proper fall to pipes. Pitch pump chamber outlet to ensure complete drainback to pump chamber.

Establish turf to prevent erosion and freezing.

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

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

All construction to be performed in accordance with MN Rule 7080.

Maintenance Requirements

See attached operating permit or management plan for details

Soil Profile Description

Last updated: 1/8/10

Date Completed :	8/7/2017	**Observation # :**	Soil Boring 1 - 2 & Soil Pit 1 - 2
Completed By :	Travis Johnson	**Equipment :**	Auger & Shovel
Client / Project :	Mille Lacs Band - Women's Shelter	**Limiting Layer :**	Concentrations at 8"
Landscape position :		**Vegitation :**	Wooded
Mapped soil type :	C11B	**Weather :**	Sunny

Observation # : Boring 1	*Primary or Alternate Site*	*Elevation:*				
Horizon Depth	**Soil Texture**	**Matrix Color**	**Redox features**	**Shape**	**Grade**	**Consistence**
0" - 11"	Fine Sandy Loam	10YR 3/3		Granular	Strong	Friable
11" - 16"	Fine Sandy Loam	10YR 4/6	Concentrations @ 11"	Granular	Strong	Friable

Observation # : Pit 1	*Primary or Alternate Site*	*Elevation:*				
Horizon Depth	**Soil Texture**	**Matrix Color**	**Redox features**	**Shape**	**Grade**	**Consistence**
0" - 8"	Fine Sandy Loam	10YR 3/3		Granular	Strong	Friable
8" - 10"	Fine Sandy Loam	10YR 6/4	Concentrations @ 8"	Granular	Strong	Friable

Observation # : Pit 2	*Primary or Alternate Site*	*Elevation:*				
Horizon Depth	**Soil Texture**	**Matrix Color**	**Redox features**	**Shape**	**Grade**	**Consistence**
0" - 10"	Fine Sandy Loam	10YR 3/3		Granular	Strong	Friable
10" - 13"	Fine Sandy Loam	7.5YR 4/4	Concentrations @ 10"	Blocky	Strong	Friable
Observation # : Boring 2	*Primary or Alternate Site*	*Elevation:*				
Horizon Depth	**Soil Texture**	**Matrix Color**	**Redox features**	**Shape**	**Grade**	**Consistence**
0" - 8"	Fine Sandy Loam	10YR 3/3		Granular	Strong	Friable
8" - 14"	Mound Sand	10YR 4/4		Single Grain	Structureless	Loose

Septic Check 6074 Keystone Rd Milaca, MN 56353
Phone: (320)-983-2447 Fax: (320)-983-2151 info@septiccheck.com www.SepticCheck.com

Mille Lacs County, Minnesota

C11B—Mora-Brennyville, wet, complex, 1 to 6 percent slopes, stony

Map Unit Setting

National map unit symbol: 1t8cw
Elevation: 980 to 1,640 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Mora, stony, and similar soils: 55 percent
Brennyville, wet, stony, and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mora, Stony

Setting

Landform: Drumlins, moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Dense loamy till

Typical profile

Ap - 0 to 8 inches: fine sandy loam
E - 8 to 12 inches: fine sandy loam
B/E, Bt - 12 to 36 inches: fine sandy loam
BC - 36 to 46 inches: fine sandy loam
BCd - 46 to 80 inches: fine sandy loam

Properties and qualities

Slope: 3 to 6 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.02 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C/D

Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Description of Brennyville, Wet, Stony

Setting

Landform: Drumlins, moraines
Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silt mantled dense loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
B/E - 8 to 11 inches: silt loam
Bt1 - 11 to 21 inches: silt loam
2Bt2, 2Bt3 - 21 to 38 inches: fine sandy loam
2BC - 38 to 45 inches: fine sandy loam
2BCd - 45 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 3 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: 40 to 60 inches to densic material
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.02 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Minor Components

Milaca, stony

Percent of map unit: 8 percent
Landform: Drumlins, moraines
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sloping Upland, Acid (G090XN006MN)
Hydric soil rating: No

Cebana, stony

Percent of map unit: 5 percent
Landform: Drumlins, moraines
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: Yes

Brennyville, stony

Percent of map unit: 5 percent
Landform: Drumlins, moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Giese, depressional, stony

Percent of map unit: 2 percent
Landform: Drumlins, moraines
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Ponded If Not Drained (G090XN013MN)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Mille Lacs County, Minnesota
Survey Area Data: Version 10, Sep 19, 2016

Minnesota Pollution Control Agency

OSTP Design Summary Worksheet

University of Minnesota

Property Owner/Client: Mille Lacs Band | Project ID: | v 07.14.15

Site Address: 40243 Beach Road Wahkon MN 56386 | Date: 8/7/17

1. DESIGN FLOW AND TANKS

A. *Design Flow:* 1350 Gallons Per Day (GPD)

Note: The estimated design flow is considered a peak flow rate including a safety factor. For long term performance, the average daily flow is recommended to be < 60% of this value.

B. *Septic Tanks:*

Minimum Code Required Septic Tank Capacity: 4050 Gallons, in 1 Tanks or Compartments

Recommended Septic Tank Capacity: 5000 Gallons, in 4 Tanks or Compartments

Effluent Screen: | Alarm:

C. *Holding Tanks Only:*

Minimum Code Required Capacity: | Gallons, in | Tanks

Designer Recommended Capacity: | Gallons, in | Tanks

Type of High Level Alarm:

D. *Pump Tank 1* Capacity (Code Minimum): 1350 Gallons — *Pump Tank 2* Capacity (Code Minimum): | Gallons

Pump Tank 1 Capacity (Designer Rec): 2500 Gallons — *Pump Tank 2* Capacity (Designer Rec): | Gallons

Pump 1: 60.0 GPM, Total Head: 29.4 ft — Pump 2: | GPM, Total Head: | ft

Supply Pipe Dia.: 2.00 in, Dose Volume: 160.0 gal — Supply Pipe Dia.: | in, Dose Volume: | gal

2. SYSTEM TYPE

○ Trench ○ Bed ◉ Mound ○ At-Grade ○ Gravity Distribution ◉ Pressure Distribution-Level ○ Pressure Distribution-Unlevel

○ Drip ○ Holding Tank ○ Other | * Selection Required

Benchmark Elevation: 100.00 ft

Benchmark Location: White X on driveway

System Type				
☐ Type I	☐ Type II	☑ Type III	☐ Type IV	☐ Type V

Type of Distribution Media:

☑ Drainfield Rock ☐ Registered Treatment Media:

3. SITE EVALUATION:

A. Depth to Limiting Layer: 8 in 0.7 ft

B. Measured Land Slope %: 6.0 %

C. Elevation of Limiting Layer: 95.4

D. Soil Texture: Fine Sandy Loam

E. Loc. of Restricive Elevation: grade at the highest rockbed loc.

F. Soil Hyd. Loading Rate: 0.78 GPD/ft²

G. Minimum Required Separation: 36 in 3.0 ft

H. Perc Rate: MPI

I. Code Maximum Depth of System: Mound in

Comments:

4. DESIGN SUMMARY

Trench Design Summary

Dispersal Area: ft² | Sidewall Depth: in | Trench Width: ft

Total Lineal Feet: ft | Number of Trenches | Code Maximum Trench Depth: in

Contour Loading Rate: ft | Designer's Max Trench Depth: in

Bed Design Summary

Absorption Area: ft² | Depth of sidewall: in | Code Maximum Bed Depth: in

Bed Width: ft | Bed Length: ft | Designer's Max Bed Depth: in

Minnesota Pollution Control Agency

OSTP Design Summary Worksheet

University of Minnesota

Mound Design Summary (Each of two mounds)

Absorption Bed Area	570.0	ft²	Bed Length	57.0	ft	Bed Width	10.0	ft
Absorption Width	15.0	ft	Clean Sand Lift	3.0	ft	Berm Width (0-1%)		ft
Upslope Berm Width	15.3	ft	Downslope Berm Width	28.1	ft	Endslope Berm Width	21.4	ft
Total System Length	99.8	ft	Total System Width	53.5	ft	Contour Loading Rate	12.0	gal/ft

At-Grade Design Summary

Absorption Bed Width		ft	Absorption Bed Length		ft	System Height		ft
Contour Loading Rate		gal/ft	Upslope Berm Width		ft	Downslope Berm Width		ft
Endslope Berm Width		ft	System Length		ft	System Width		ft

Level & Equal Pressure Distribution Summary (each of two)

No. of Perforated Laterals	3		Perforation Spacing	3	ft	Perforation Diameter	1/4	in
Lateral Diameter	2.00	in	Min. Delivered Volume	112	gal	Maximum Delivered Volume	338	gal

Non-Level and Unequal Pressure Distribution Summary

	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perforation Size (in)	Spacing (ft)	Spacing (in)
Lateral 1							
Lateral 2							
Lateral 3							
Lateral 4							
Lateral 5							
Lateral 6							

Minimum Delivered Volume _____ gal

Maximum Delivered Volume _____ gal

5. Additional Info for Type IV/Pretreatment Design

A. *Calculate the organic loading*

1. *Organic Loading to Pretreatment Unit = Design Flow X Estimated BOD* in mg/L in the effluent X 8.35 ÷ 1,000,000

_____ gpd X _____ mg/L X 8.35 ÷ 1,000,000 = _____ lbs BOD/day

2. Type of Pretreatment Unit Being Installed: _____

3. Calculate *Soil Treatment System Organic Loading: BOD concentration after pretreatment ÷ Bottom Area* = lbs/day/ft²

_____ mg/L X 8.35 ÷ 1,000,000 ÷ _____ ft² = _____ lbs/day/ft²

Comments/Special Design Considerations:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Travis Johnson		2624	08/07/17
(Designer)	(Signature)	(License #)	(Date)

Minnesota Pollution Control Agency

OSTP Mound Design Each of Two Mounds

University of Minnesota

1. SYSTEM SIZING:

Project ID:

v 07.14.15

A. Design Flow:	684	GPD
B. Soil Loading Rate:	0.78	GPD/ft²
C. Depth to Limiting Condition:	0.7	ft
D. Percent Land Slope:	6.0	%
E. Design Media Loading Rate:	1.2	GPD/ft²
F. Mound Absorption Ratio:	1.50	

Table I
MOUND CONTOUR LOADING RATES:

Measured Perc Rate	OR	Texture - derived mound absorption ratio		Contour Loading Rate:
≤ 60mpi	OR	1.0, 1.3, 2.0, 2.4, 2.6		≤12
61-120 mpi	OR	5.0		≤12
≥ 120 mpi*		>5.0*		≤6*

TABLE IXa

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA AND ABSORPTION RATIOS USING PERCOLATION TESTS

Percolation Rate (MPI)	Treatment Level C		Treatment Level A, A-2, B,	
	Absorption Area Loading Rate (gpd/ft²)	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft²)	Mound Absorption Ratio
<0.1	-	1	-	1
0.1 to 5	1.2	1	1.6	1
0.1 to 5 (fine sand and loamy fine sand)	0.6	2	1	1.6
6 to 15	0.78	1.5	1	1.6
16 to 30	0.6	2	0.78	2
31 to 45	0.5	2.4	0.78	2
46 to 60	0.45	2.6	0.6	2.6
61 to 120	-	5	0.3	5.3
>120	-	-	-	-

*Systems with these values are not Type I systems. Contour Loading Rate (linear loading rate) is a recommended value.

2. DISPERSAL MEDIA SIZING

A. Calculate Dispersal Bed Area: Design Flow ÷ Design Media Loading Rate = ft²

684 GPD ÷ 1.2 GPD/ft² = 570 ft²

If a larger dispersal media area is desired, enter size: 570 ft²

B. Enter Dispersal Bed Width: 10.0 ft *Can not exceed 10 feet*

C. Calculate Contour Loading Rate: Bed Width X Design Media Loading Rate

10 ft² X 1.2 GPD/ft² = 12.0 gal/ft *Can not exceed Table 1*

D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area ÷ Bed Width = Bed Length

570 ft² ÷ 10.0 ft = 57.0 ft

3. ABSORPTION AREA SIZING

A. Calculate Absorption Width: Bed Width X Mound Absorption Ratio = Absorption Width

10.0 ft X 1.5 = 15.0 ft

B. For slopes >1%, the Absorption Width is measured downhill from the upslope edge of the Bed.

Calculate Downslope Absorption Width: Absorption Width - Bed Width

15.0 ft - 10.0 ft = 5.0 ft

4. DISTRIBUTION MEDIA: ROCK

A. Media Volume: Media Depth X Length X Width

0.75 ft X 57.0 ft X 10.0 ft = 428 ft³ ÷ 27 = 16 yd³

5. DISTRIBUTION MEDIA: REGISTERED TREATMENT PRODUCTS: CHAMBERS AND EZFLOW

A. Enter Dispersal Media:

B. Enter the Component: Length: ft Width: ft Depth: ft

C. Number of Components per Row = Bed Length divided by Component Length (Round up)

ft ÷ ft = components/row

D. Actual Bed Length = Number of Components/row X Component Length:

components X ft = ft

E. Number of Rows = Bed Width divided by Component Width (Round up)

ft ÷ ft = rows *Adjust width so this is on whole number.*

F. Total Number of Components = Number of Components per Row X Number of Rows

X = components

6. MOUND SIZING

A. Calculate Minimum Clean Sand Lift: 3 feet minus Depth to Limiting Condition = Clean Sand Lift

3.0 ft - 0.7 ft = 2.3 ft Design Sand Lift (optional): 3 ft

B. Calculate Upslope Height: Clean Sand Lift + media depth + cover (1 ft.) = Upslope Height

3.0 ft + 0.8 ft + 1.0 ft = 4.8 ft

C. Select Upslope Berm Multiplier (based on land slope): 3.23

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Upslope Berm Ratio	3:1	3.00	2.91	2.83	2.75	2.68	2.61	2.54	2.48	2.42	2.36	2.31	2.26	2.21
	4:1	4.00	3.85	3.70	3.57	3.45	3.33	3.23	3.12	3.03	2.94	2.86	2.78	2.70

D. Calculate Upslope Berm Width: Multiplier X Upslope Mound Height = Upslope Berm Width

3.23 ft X 4.8 ft = 15.3 ft

E. Calculate Drop in Elevation Under Bed: Bed Width X Land Slope ÷ 100 = Drop (ft)

10.0 ft X 6.0 % ÷ 100 = 0.60 ft

F. Calculate Downslope Mound Height: Upslope Height + Drop in Elevation = Downslope Height

4.8 ft + 0.60 ft = 5.4 ft

G. Select Downslope Berm Multiplier (based on land slope): 5.26

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Downslope Berm Ratio	3:1	3.00	3.09	3.19	3.30	3.41	3.53	3.66	3.80	3.95	4.11	4.29	4.48	4.69
	4:1	4.00	4.17	4.35	4.54	4.76	5.00	5.26	5.56	5.88	6.25	6.67	7.14	7.69

H. Calculate Downslope Berm Width: Multiplier X Downslope Height = Downslope Berm Width

5.26 x 5.4 ft = 28.1 ft

I. Calculate Minimum Berm to Cover Absorption Area: Downslope Absorption Width + 4 feet

5.0 ft + 4 ft = 9.0 ft

J. Design Downslope Berm = greater of 4H and 4I: 28.1 ft

K. Select Endslope Berm Multiplier: 4.00 *(usually 3.0 or 4.0)*

L. Calculate Endslope Berm X Downslope Mound Height = Endslope Berm Width

4.00 ft X 5.4 ft = 21.4 ft

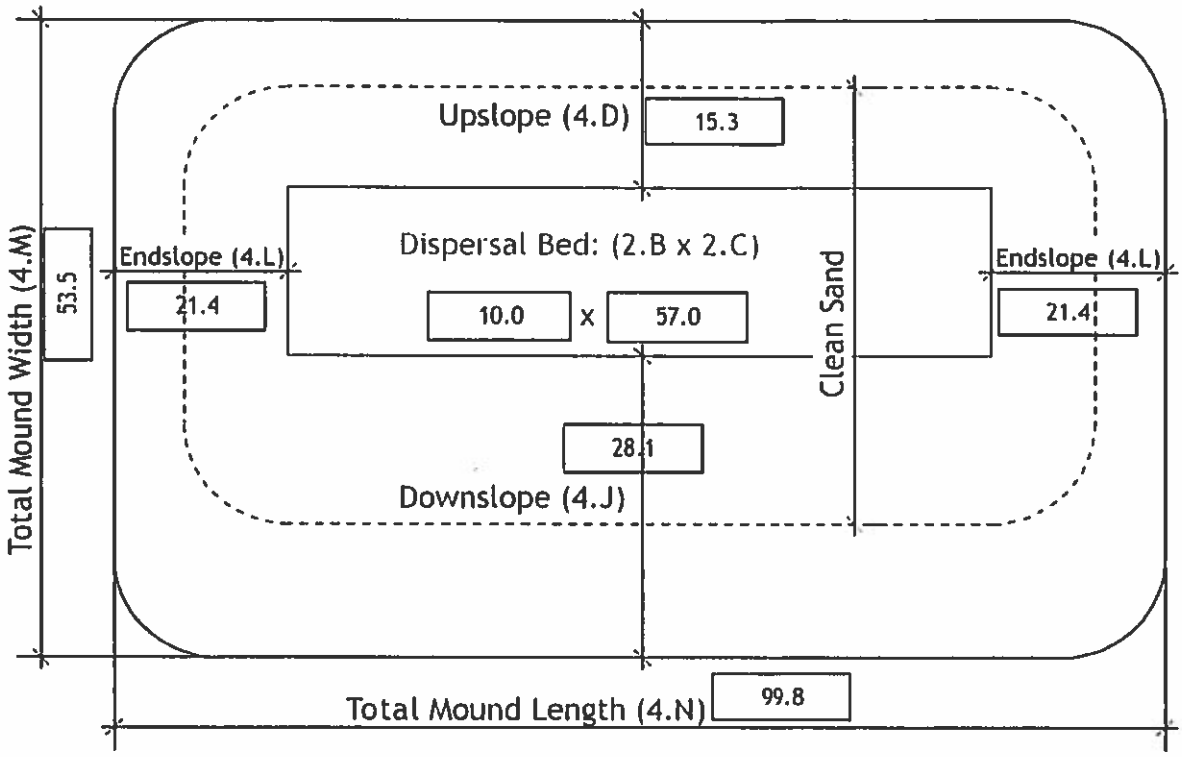
M. Calculate Mound Width: Upslope Berm Width + Bed Width + Downslope Berm Width

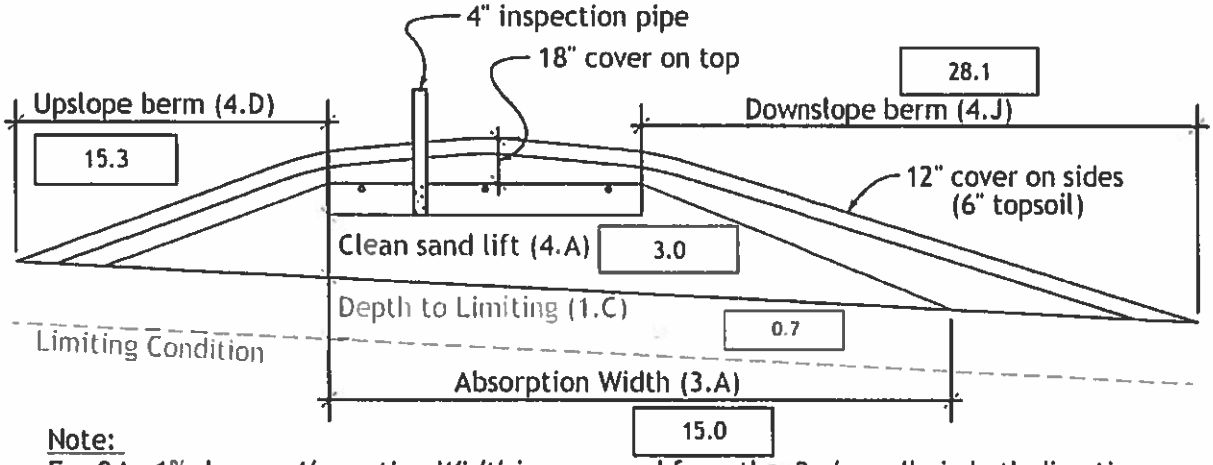
15.3 ft + 10.0 ft + 28.1 ft = 53.5 ft

N. Calculate Mound Length: Endslope Berm Width + Bed Length + Endslope Berm Width

21.4 ft + 57.0 ft + 21.4 ft = 99.8 ft

7. MOUND DIMENSIONS





Note:
For 0 to 1% slopes, *Absorption Width* is measured from the *Bed* equally in both directions.
For slopes >1%, *Absorption Width* is measured downhill from the upslope edge of the *Bed*.

Comments:

Minnesota Pollution Control Agency

OSTP Mound Materials Worksheet

University of Minnesota

Project ID: v 07.14.15

A. Calculate *Bed* (rock) *Volume*: *Bed Length* (2.C) X *Bed Width* (2.B) X *Depth* = *Volume* (ft^3)

57.0 ft X 10.0 ft X 1.0 = 570.0 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards:

570.0 ft^3 ÷ 27 = 21.1 yd^3

Add 20% for constructability: 21.1 yd^3 X 1.2 = 25.3 yd^3

B. Calculate *Clean Sand Volume:*

Volume Under Rock bed: *Average Sand Depth* x *Media Width* x *Media Length* = cubic feet

3.1 ft X 10.0 ft X 57.0 ft = 1738.5 ft^3

For a Mound on a slope from 0-1%

Volume from Length = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Length)

(ft - 1) X X ft =

Volume from Width = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Width)

(ft - 1) X X ft =

Total Clean Sand Volume: *Volume from Length* + *Volume from Width* + *Volume Under Media*

ft^3 + ft^3 + ft^3 = ft^3

For a Mound on a slope greater than 1%

Upslope Volume: ((*Upslope Mound Height* - *1*) x 3 x *Bed Length*) ÷ 2 = cubic feet

((4.8 ft - 1) X 3.0 ft X 57.0) ÷ 2 = 320.6 ft^3

Downslope Volume: ((*Downslope Height* - *1*) x Downslope Absorption Width x *Media Length*) ÷ 2 = cubic feet

((5.4 ft - 1) X 5.0 ft X 57.0) ÷ 2 = 619.9 ft^3

Endslope Volume: (*Downslope Mound Height* - *1*) x 3 x *Media Width* = cubic feet

(5.4 ft - 1) X 3.0 ft X 10.0 ft = 130.5 ft^3

Total Clean Sand Volume: *Upslope Volume* + *Downslope Volume* + *Endslope Volume* + *Volume Under Media*

320.6 ft^3 + 619.9 ft^3 + 130.5 ft^3 + 1738.5 ft^3 = 2809.5 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 2809.5 ft^3 ÷ 27 = 104.1 yd^3

Add 20% for constructability: 104.1 yd^3 X 1.2 = 124.9 yd^3

C. Calculate *Sandy Berm Volume:*

Total Berm Volume (approx): ((Avg. Mound Height - 0.5 ft topsoil) x Mound Width x Mound Length) ÷ 2 = cubic feet

(5.1 - 0.5)ft X 53.5 ft X 99.8) ÷ 2 = 12143.2 ft^3

Total Mound Volume - Clean Sand volume -Rock Volume = cubic feet

12143.2 ft^3 - 2809.5 ft^3 - 570.0 ft^3 = 8763.7 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 8763.7 ft^3 ÷ 27 = 324.6 yd^3

Add 20% for constructability: 324.6 yd^3 x 1.2 = 389.5 yd^3

D. Calculate *Topsoil Material Volume: Total Mound Width X Total Mound Length X .5 ft*

53.5 ft X 99.8 ft X 0.5 ft = 2668.8 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 2668.8 ft^3 ÷ 27 = 98.8 yd^3

Add 20% for constructability: 98.8 yd^3 x 1.2 = 118.6 yd^3

Minnesota Pollution Control Agency

OSTP Pressure Distribution Each of Two

University of Minnesota

Project ID: v 07.14.15

1. Media Bed Width: 10 ft

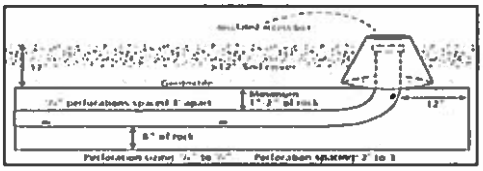
2. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width - 4) ÷ 3] + 1.

(10 - 4) + 1 = 3 laterals *Does not apply to at-grades*

3. Designer Selected *Number of Laterals*: 3 laterals
Cannot be less than line 2 (accept in at-grades)

4. Select *Perforation Spacing*: 3.0 ft

5. Select *Perforation Diameter Size:* 1/4 in



6. *Length of Laterals* = Media Bed Length - 2 Feet.

57 - 2ft = 55 ft *Perforation can not be closer then 1 foot from edge.*

7. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals* by the *Perforation Spacing* and round down to the nearest whole number.

Number of Perforation Spaces = 55 ft ÷ 3 ft = 18 Spaces

8. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces*. Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

Perforations Per Lateral = 18 Spaces + 1 = 19 Perfs. Per Lateral

Maximum Number of Perforations Per Lateral to Guarantee <10% Discharge Variation

1/4 Inch Perforations						7/32 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3		1	1¼	1½	2	3
2	10	13	18	30	60	2	11	16	21	34	68
2½	8	12	16	28	54	2½	10	14	20	32	64
3	8	12	16	25	52	3	9	14	19	30	60
3/16 Inch Perforations						1/8 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3		1	1¼	1½	2	3
2	12	18	26	46	87	2	21	33	44	74	149
2½	12	17	24	40	80	2½	20	30	41	69	135
3	12	16	22	37	75	3	20	29	38	64	128

9. *Total Number of Perforations* equals the *Number of Perforations per Lateral* multiplied by the *Number of Perforated Laterals.*

19 Perf. Per Lat. X 3 Number of Perf. Lat. = 57 Total Number of Perf.

10. Select *Type of Manifold Connection* (End or Center): ☑ End ☐ Center

11. *Select Lateral Diameter (See Table)*: 2.00 in

Minnesota Pollution Control Agency

OSTP Pressure Distribution
Each of Two

University of Minnesota

12. Calculate the *Square Feet per Perforation. Recommended value is 4-11 ft² per perforation.*
Does not apply to At-Grades

a. *Bed Area* = Bed Width (ft) X Bed Length (ft)

10	ft	X	57	ft	=	570 ft²

b. *Square Foot per Perforation* = *Bed Area* divided by the *Total Number of Perforations*.

570	ft²	÷	57	perforations	=	10.0 ft²/perforations

13. Select *Minimum Average Head*: 2.0 ft

14. Select *Perforation Discharge* (GPM) based on Table: 1.04 GPM per Perforation

15. Determine required *Flow Rate* by multiplying the *Total Number of Perfs.* by the *Perforation Discharge.*

57	Perfs	X	1.04	GPM per Perforation =		60 GPM

16. *Volume of Liquid Per Foot of Distribution Piping (Table II)*: 0.170 Gallons/ft

17. *Volume of Distribution Piping* =
= [*Number of Perforated Laterals* X *Length of Laterals* X (Volume of Liquid Per Foot of Distribution Piping]

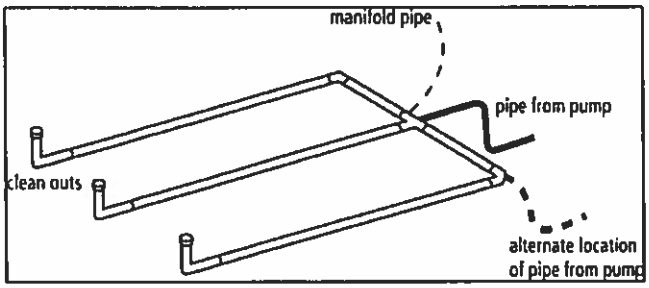
3	X	55	ft	X	0.170	gal/ft	=	28.1 Gallons

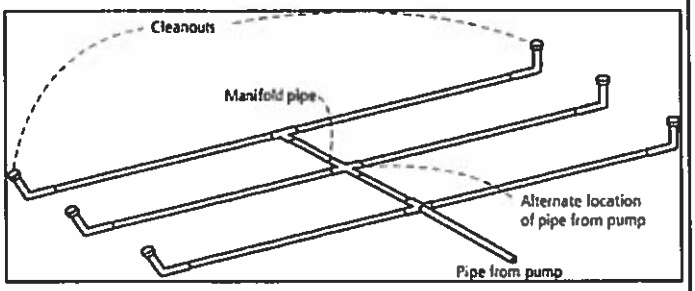
18. Minimum Delivered Volume = Volume of Distribution Piping X 4

28.1	gals	X	4	=	112.2 Gallons

Table II
Volume of Liquid in Pipe

Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661





Comments/Special Design Considerations:

Minnesota Pollution Control Agency

OSTP Basic Pump Selection Each of two pumps

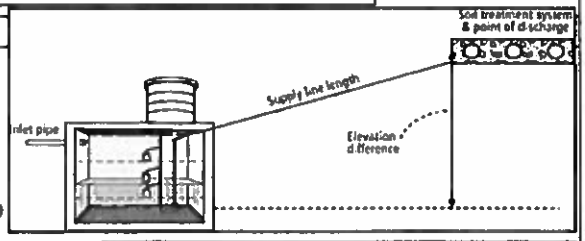
University of Minnesota

1. PUMP CAPACITY Project ID:

Pumping to Gravity or Pressure Distribution: ○ Gravity ◉ Pressure **Selection required**

1. If pumping to gravity enter the gallon per minute of the pump: _____ GPM *(10 - 45 gpm)*
2. If pumping to a pressurized distribution system: 60.0 GPM
3. Enter pump description: Demand Dosing Soil Treatment

2. HEAD REQUIREMENTS



A. Elevation Difference between pump and point of discharge: 10 ft

B. Distribution Head Loss: 6 ft

C. Additional Head Loss: _____ ft (due to special equipment, etc.)

Distribution Head Loss	
Gravity Distribution = 0ft	
Pressure Distribution based on Minimum Average Head Value on Pressure Distribution Worksheet:	
Minimum Average Head	**Distribution Head Loss**
1ft	5ft
2ft	6ft
5ft	10ft

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 125 ft

E. **Friction Loss in Plastic Pipe per 100ft** from Table I:

Friction Loss = 8.55 ft per 100ft of pipe

F. Determine *Equivalent Pipe Length* from pump discharge to soil dispersal area discharge point. Estimate by adding 25% to supply pipe length for fitting loss. *Supply Pipe Length (D.2)* X 1.25 = *Equivalent Pipe Length*

125 ft X 1.25 = 156.3 ft

Table I.Friction Loss in Plastic Pipe per 100ft

Flow Rate (GPM)	Pipe Diameter (inches)			
	1	1.25	1.5	2
10	9.1	3.1	1.3	0.3
12	12.8	4.3	1.8	0.4
14	17.0	5.7	2.4	0.6
16	21.8	7.3	3.0	0.7
18		9.1	3.8	0.9
20		11.1	4.6	1.1
25		16.8	6.9	1.7
30		23.5	9.7	2.4
35			12.9	3.2
40			16.5	4.1
45			20.5	5.0
50				6.1
55				7.3
60				8.6
65				10.0
70				11.4
75				13.0
85				16.4
95				20.1

G. Calculate *Supply Friction Loss* by multiplying *Friction Loss Per 100ft* (Line E) by the *Equivalent Pipe Length* (Line F) and divide by 100.

Supply Friction Loss =

8.55 ft per 100ft X 156.3 ft + 100 = 13.4 ft

H. *Total Head* requirement is the sum of the *Elevation Difference* (Line A), the Distribution Head Loss (Line B), Additional Head Loss (Line C), and the Supply Friction Loss (Line G)

10.0 ft + 6.0 ft + _____ ft + 13.4 ft = 29.4 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **60.0** GPM (Line 1 or Line 2) with at least **29.4** feet of total head.

Comments:

Minnesota Pollution Control Agency

OSTP Pump Tank Design Worksheet

University of Minnesota

DETERMINE TANK CAPACITY AND DIMENSIONS | Project ID: | v 07.14.15

1. A. *Design Flow (Design Sum 1A)*: 1350 GPD

   B. Min. required pump tank capacity: 1350 Gal C. Recommended pump tank capacity: 2500 Gal

   D. Pump tank description: Time to Pressure

MEASURED TANK CAPACITY (existing tanks):

2. A. Rectangle area = Length (L) X Width (W)

   ____ ft X ____ ft = ____ ft^2

   B. Circle area = $3.14r^2$ (3.14 X radius X radius)

   3.14 X ____ ^{2} ft = ____ ft^2

   C. Calculate Gallons Per Inch. Multiply the area from 1.A or 1.B, by 7.5 to determine the gallons per foot the tank holds and divide by 12 to calculate the gallons per inch.

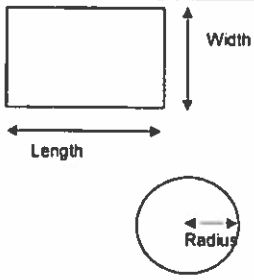
   ____ ft^2 X 7.5 gal/ft^3 ÷ 12 in/ft = ____ Gallons per inch

   D. Calculate *Total Tank Volume*

   Depth from bottom of inlet pipe to tank bottom: ____ in

   Total Tank Volume = *Depth from bottom of inlet pipe* (Line 4.A) X *Gallons/inch* (Line 2)

   ____ in X 43.9 Gallons Per Inch = ____ Gallons



MANUFACTURER'S SPECIFIED TANK CAPACITY (when available):

3. A. Tank Manufacturer: Brown Wilbert

   B. Tank Model: 2500 Gallon Single Compartment

   C. Capacity from manufacturer: 2500 Gallons

   D. Gallons per inch from manufacturer: 43.9 Gallons per inch

   E. Liquid depth of tank from manufacturer: 57.0 inches

Note: Design calculations are based on this specific tank. Substituting a different tank model will change the pump float or timer settings. Contact designer if changes are necessary.

DETERMINE DOSING VOLUME

4. Calculate *Volume to Cover Pump* (The inlet of the pump must be at least 4-inches from the bottom of the pump tank & 2 inches of water covering the pump is recommended)

   (Pump and block height + 2 inches) X *Gallons Per Inch* (2C or 3E)

   (14 in + 2 inches) X 43.9 Gallons Per Inch = 702 Gallons

5. *Minimum Delivered Volume* = 4 X Volume of Distribution Piping:

   - *Line 17 of the Pressure Distribution or Line 11 of Non-level* 112 Gallons (minimum dose)

6. Calculate *Maximum Pumpout Volume* (25% of Design Flow)

   Design Flow: 684 GPD X 0.25 = 171 Gallons (maximum dose)

7. *Select a pumpout volume that meets both Minimum and Maximum:* 160 Gallons

8. Calculate *Doses Per Day* = Design Flow ÷ *Delivered Volume*

   684 gpd ÷ 160 gal = 4 *Doses*

9. Calculate Drainback:

   A. *Diameter of Supply Pipe* = 2 inches

   B. Length of Supply Pipe = 125 feet

   C. *Volume of Liquid Per Lineal Foot of Pipe* = 0.170 Gallons/ft

   D. *Drainback* = *Length of Supply Pipe* X *Volume of Liquid Per Lineal Foot of Pipe*

   125 ft X 0.170 gal/ft = 21.3 Gallons

10. *Total Dosing Volume* = *Delivered Volume* plus *Drainback*

    160 gal + 21.3 gal = 181 Gallons

11. Minimum Alarm Volume = Depth of alarm (2 or 3 inches) X gallons per inch of tank

    ____ in X 43.9 gal/in = ____ Gallons

Volume of Liquid in Pipe	
Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661

Minnesota Pollution Control Agency

OSTP Pump Tank Design Worksheet

University of Minnesota

TIMER or DEMAND FLOAT SETTINGS

Select Timer or Demand Dosing: (•) Timer ( ) Demand Dose

A. Timer Settings

12. Required *Flow Rate*:

A. From Design (Line 12 of Pressure, Line 10 of Non-Level or Line 6 of Pump*): 60 GPM

B. Or calculated: GPM = Change in Depth (in) x Gallons Per Inch / Time Interval in Minutes

[ ] in X [43.9] gal/in ÷ [ ] min = [ ] GPM

*Note: This value must be adjusted after installation based on pump calibration.

13. Flow Rate from Line 12.A or 12.B above. 60 GPM

14. Calculate TIMER ON setting:

Total Dosing Volume / GPM

[181] gal ÷ [60.0] gpm = 3.0 Minutes ON

15. Calculate TIMER OFF setting:

Minutes Per Day (1440) / *Doses Per Day* - Minutes On

1440 min ÷ [4] doses/day - [3.0] min = 357.0 Minutes OFF

16. Pump Off Float - Measuring from bottom of tank:

Distance to set Pump Off Float = Gallons to Cover Pump / Gallons Per Inch:

[701.76] gal ÷ [43.9] gal/in = 16.0 Inches

17. Alarm Float - Measuring from bottom of tank:

Distance to set Alarm Float = Tank Depth(4A) X 90% of Tank Depth

[57] in X 0.90 = 51.3 in

B. DEMAND DOSE FLOAT SETTINGS

18. Calculate *Float Separation Distance* using *Dosing Volume*.

Total Dosing Volume / Gallons Per Inch

[ ] gal ÷ [ ] gal/in = [ ] Inches

19. Measuring from bottom of tank:

A. *Distance to set Pump Off Float* = Pump + block height + 2 inches

[ ] in + [ ] in = [ ] Inches

B. *Distance to set Pump On Float = Distance to Set Pump Off Float + Float Separation Distance*

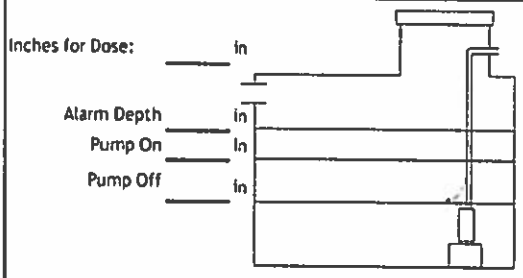
[ ] in + [ ] in = [ ] Inches

C. *Distance to set Alarm Float = Distance to set Pump-On Float + Alarm Depth* (2-3 inches)

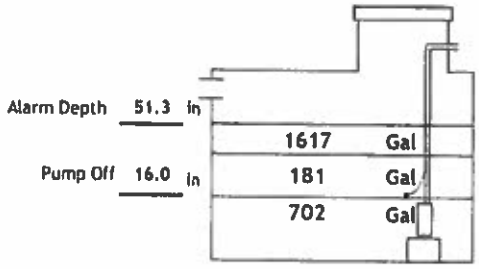
[ ] in + [ ] in = [ ] Inches

FLOAT SETTINGS

DEMAND DOSING



TIMED DOSING



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Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

This **management plan** will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

Proper septic system design, installation, operation and maintenance means safe and clean water!

Property Owner	Mille Lacs Band of Ojibwe	Email	
Property Address	40243 Beach Road Wahkon MN 56386	Property ID	17-414-0050
System Designer	Septic Check	Contact Info	320-983-2447
System Installer	Septic Check	Contact Info	320-983-2447
Service Provider/Maintainer	Septic Check	Contact Info	320-983-2447
Permitting Authority	Mille Lacs County	Contact Info	320-983-8308
Permit #		Date Inspected	

Keep this Management Plan with your Septic System Owner's Guide. The Septic System Owner's Guide includes a folder to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities, or water-use appliances.

For a copy of the *Septic System Owner's Guide*, visit www.bookstores.umn.edu and search for the word "septic" or call 800-322-8642.

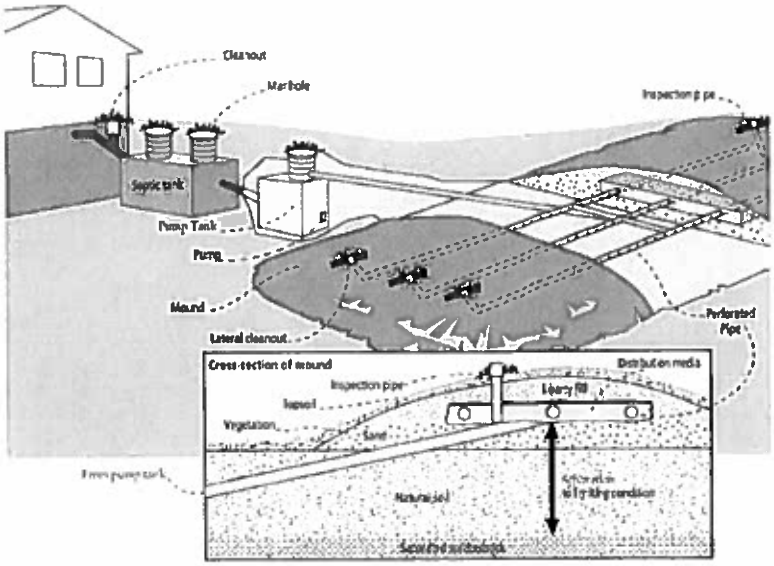
For more information see http://septic.umn.edu

Version: August 2015

UNIVERSITY OF MINNESOTA

Septic System Management Plan for Above Grade Systems

Your Septic System



Septic System Specifics

System Type: ○ I ○ II ◉ III ○ IV* ○ V*

(Based on MN Rules Chapter 7080.2200 – 2400)

**Additional Management Plan required*

☐ System is subject to operating permit*

☐ System uses UV disinfection unit*

Type of advanced treatment unit _____

Dwelling Type

Number of bedrooms: up to 30 tenants

System capacity/ design flow (gpd): 1350

Anticipated average daily flow (gpd): 650

Comments _____

Business? : ◉ Y ○ N What type? Shelter

Well Construction

Well depth (ft): Deep Well

☒ Cased well Casing depth: _____

☐ Other (specify): _____

Distance from septic (ft): >100'

Is the well on the design drawing? ◉ Y ○ N

Septic Tank

☐ First tank *Tank volume:* 2500 *gallons*

Does tank have two compartments? ◉ Y ○ N

☐ Second tank *Tank volume:* 2500 *gallons*

☐ Tank is constructed of Concrete

☐ Effluent screen: ○ Y ◉ N Alarm ○ Y ◉ N

☐ Pump Tank 2500 *gallons*

☐ Effluent Pump *make/model:* Champion CPSTEP5

Pump capacity 60 GPM

TDH 29.4 Feet of head

☐ Alarm location Outdoor Powerpost

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 53.5 ft x 99.8 ft

Rock bed size (width x length): 10 ft x 57 ft

Location of additional STA: _____

Type of distribution media: 1 1/2" Washed Rock

☑ Inspection ports ☑ Cleanouts

☑ Surface water diversions

☐ Additional STA not available

Homeowner Management Tasks

These op*eration and maintenance* activities are your responsibility. *Chart on page 6 can help track your activities.*

Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!

The system and septic tanks needs to be checked every 12 months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

Annually

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days).* Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

During each visit by a service provider or pumper/maintainer

- Make sure that your service professional services the tank through the manhole. (NOT though a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.

Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. At each visit a written report/record must be provided to homeowner.

Plumbing/Source of Wastewater

- Review the Water Use Appliance Chart on Page 5 with homeowner.
  Discuss any changes in water use and the impact those changes may have on the septic system.
- Review water usage rates (if available) with homeowner.

Septic Tank/Pump Tanks

- *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and caps.
- *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump tank, pump if needed.

Pump

- *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- *Alarm.* Verify that the alarm works.
- *Drainback.* Check to make sure it is draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: 160 gallons: Pump run time: 29 Minutes

Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

All other components – evaluate as listed here: _____

_____

Water-Use Appliances and Equipment in the Home

Appliance	Impacts on System	Management Tips
Garbage disposal	• Uses additional water. • Adds solids to the tank. • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Use of a garbage disposal is not recommended. • Minimize garbage disposal use. Compost instead. • To prevent solids from exiting the tank, have your tank pumped more frequently. • Add an effluent screen to your tank.
Washing machine	• Washing several loads on one day uses a lot of water and may overload your system. • Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.	• Choose a front-loader or water-saving top-loader, these units use less water than older models. • Limit the addition of extra solids to your tank by using liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners. • Install a lint filter after the washer and an effluent screen to your tank • Wash only full loads and think even – spread your laundry loads throughout the week.
Dishwasher	• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area. • New models promote "no scraping". They have a garbage disposal inside.	• Use gel detergents. Powdered detergents may add solids to the tank. • Use detergents that are low or no-phosphorus. • Wash only full loads. • Scrape your dishes anyways to keep undigested solids out of your septic system.
Grinder pump (in home)	• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Expand septic tank capacity by a factor of 1.5. • Include pump monitoring in your maintenance schedule to ensure that it is working properly. • Add an effluent screen.
Large bathtub (whirlpool)	• Large volume of water may overload your system. • Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.	• Avoid using other water-use appliances at the same time. For example, don't wash clothes and take a bath at the same time. • Use oils, soaps, and cleaners in the bath or shower sparingly.
Clean Water Uses	**Impacts on System**	**Management Tips**
High-efficiency furnace	• Drip may result in frozen pipes during cold weather.	• Re-route water directly out of the house. Do not route furnace discharge to your septic system.
Water softener Iron filter Reverse osmosis	• Salt in recharge water may affect system performance. • Recharge water may hydraulically overload the system.	• These sources produce water that is not sewage and should not go into your septic system. • Reroute water from these sources to another outlet, such as a dry well, draintile or old drainfield. • When replacing, consider using a demand-based recharge vs. a time-based recharge. • Check valves to ensure proper operation; have unit serviced per manufacturer directions
Surface drainage Footing drains	• Water from these sources will overload the system and is prohibited from entering septic system.	

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Septic System Management Plan for Above Grade Systems

Homeowner Maintenance Log

Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.

Activity	Date accomplished									
Check frequently:										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
Check annually:										
Water usage rate (maximum gpd ____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

*Monthly

**Quarterly

***Bi-Annually

Notes: If flow exceeds system capacity, check for and repair any leaks into the system, including household plumbing fixtures. If system ponds or otherwise cannot handle flow, repair options include; adjust time dosing, adding pre-treatment, or expanding the system.

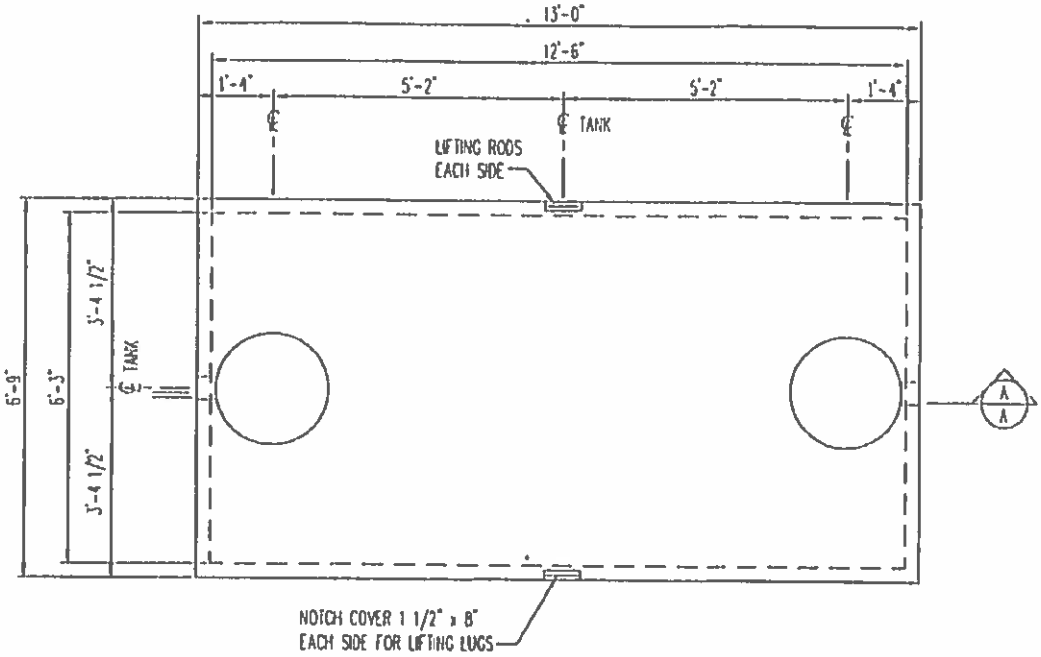
"As the owner of this SSTS, I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in this Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: _____ Date _____

Management Plan Prepared By: Travis Johnson Certification # 2624

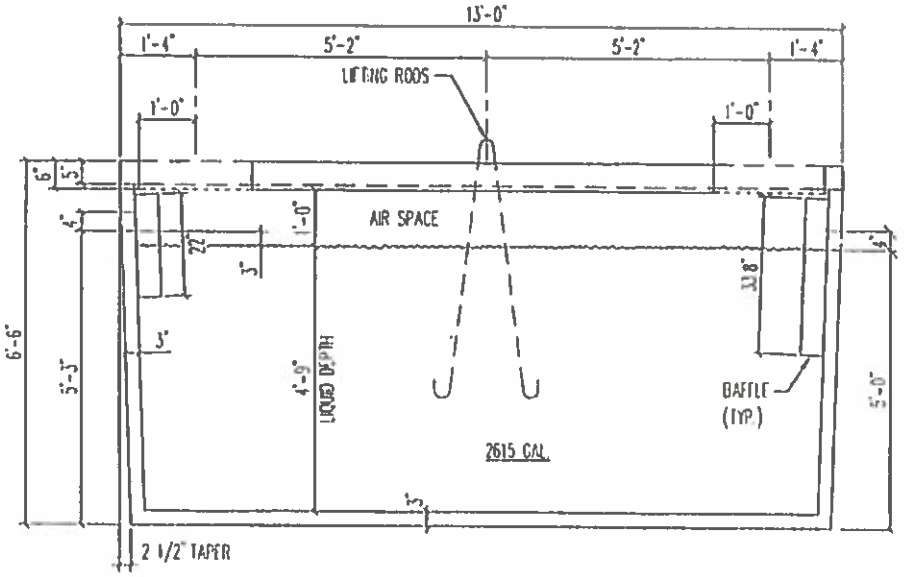
Permitting Authority: Mille Lacs County

(1) Pump Tank



2500 GALLON TANK

1/2" = 1'-0"



A/A SECTION

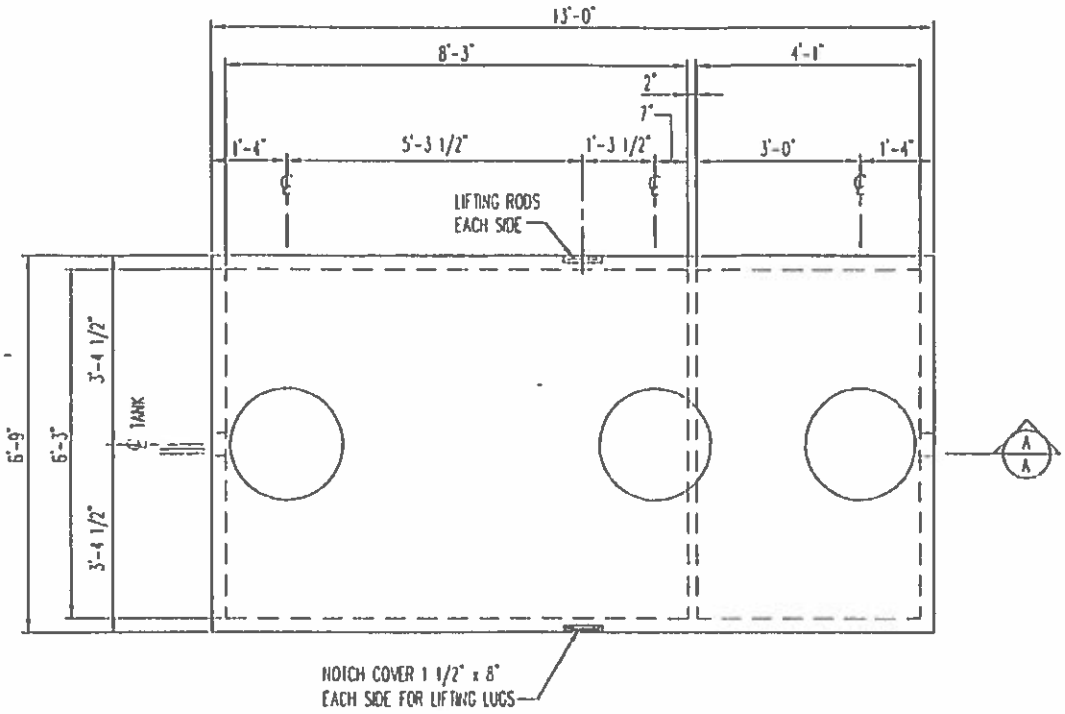
1/2" = 1'-0"

NOTE:

1. PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID

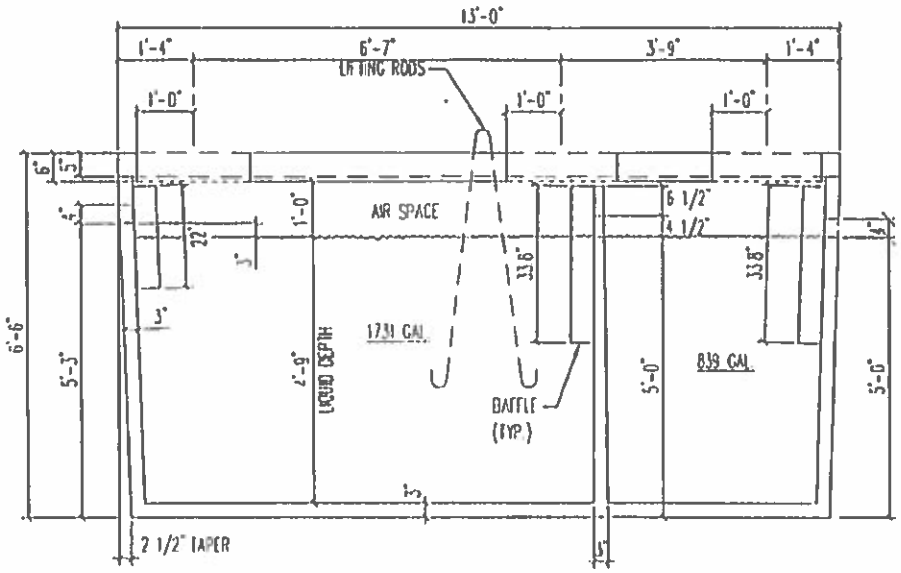
2500 GALLON SEPTIC TANK (2500 ST)	Brown & Wilbert	WEIGHT = 18,800 # MAX. SOIL COVER = 4'-0"

(2) Septic Tanks



2500 GALLON 2 COMP. TANK

1/2" = 1'-0"



A/A SECTION

1/2" = 1'-0"

NOTE:

1. PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID

2500 GALLON 2 COMP. SEPTIC TANK (2500 2C)	Brown Wilbert	WEIGHT=19,500# MAX. SOIL COVER= 6'-0" TOTAL LIQUID VOLUME= 2570 GAL.

Champion Pump

CPSTEP 1/2 - 2HP

EFFLUENT

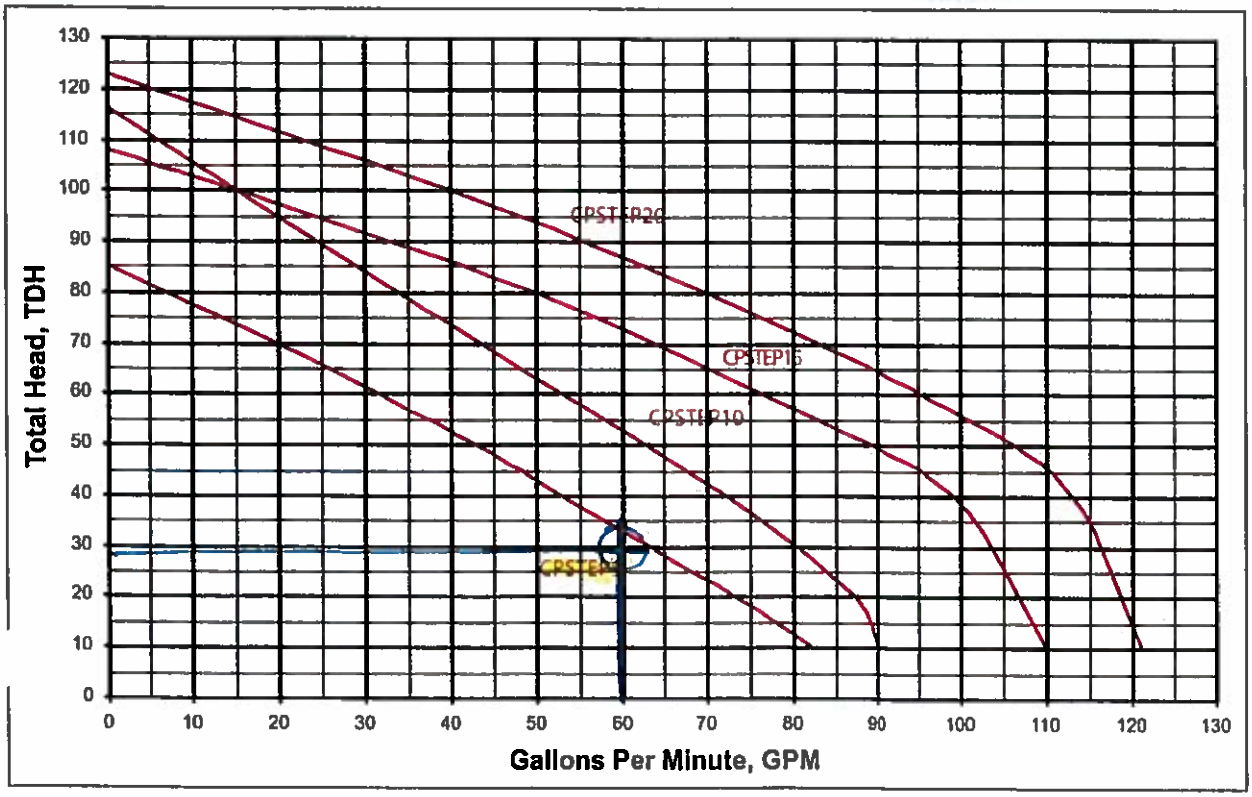
FEATURES/BENEFITS

- Performances
  - Heads Up To 122' TDH
  - Flows Up To 122 GPM
- Oil Filled High Efficient Motor With Upper & Lower Ball Bearings
  - Maximum Motor Cooling
  - Runs Cooler & Last Longer
  - Internal Overload Protection
- Cast Iron Impeller
  - Pass 3/4" Solids
- Quick Disconnect Power Cord & (Seal Failure Cord) Optional
  - Prevents Water From Entering The Motor Housing
  - Easy To Replace
  - Up To 50' Available
- Heavy Duty Cast Iron Construction
- Piggy-Back Switch Design
  - Defective Switches Can Be Diagnosed By Phone
  - Pump Can Be Operated Manually By Overriding The Switch
- Every Pump Is Performance Tested In Water
  - Ensures That The Pump Meets Head & Flow Requirements
- Optional Double Seal Design With Seal Failure
- Easy To Install
- Quick Delivery
- Complete Packages With Or Without Rail Systems

APPLICATIONS

- Residential Developments, Residential & Commercial STEP Systems, Dewatering, Elevator Pits, Septic Systems

CHAMPION PUMP - PUMP PERFORMANCE CURVE



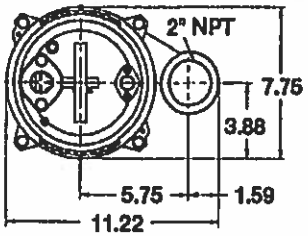
Champion Pump Company, Inc • P.O. Box 528 • Ashland, OH 44805
Phone 419-281-4500 • Toll Free 800-659-4491 • Fax 419-616-1100

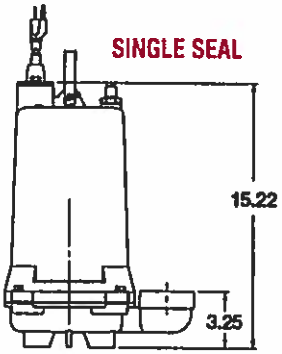
Champion Pump

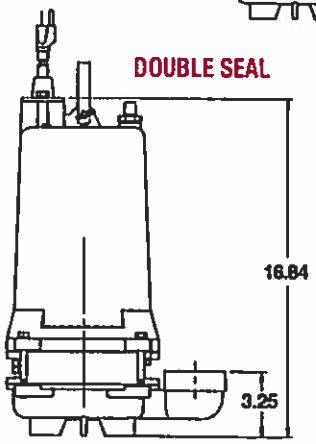
CPSTEP 1/2 - 2HP

EFFLUENT

DISCHARGE	2" NPT. Vertical Standard
SOLIDS HANDLING	3/4"
LIQUID TEMPERATURE	140 Degrees F. (Intermittent)
MOTOR HOUSING	Cast Iron
VOLUTE	Cast Iron
SEAL PLATE	Cast Iron
IMPELLER	Cast Iron
SHAFT	416 Stainless Steel
SHAFT SEAL (SINGLE SEAL)	Carbon – Ceramic/ Buna-N-Elastomer 300 Series Stainless Steel – Hardware
SHAFT SEAL (DOUBLE SEAL)	Tandem Double Mechanical Upper & Lower/ Carbon-Ceramic Buna-N-Elastomer 300 Series Stainless Steel - Hardware
BEARING (UPPER & LOWER)	Single Row, Ball, Oil Lubricated
HARDWARE	300 Series Stainless Steel
O-RINGS	Buna-N
CORD	20' Length Standard UL/CSA (SJOW) 14/3 (.375 OD) Quick Disconnect Pin Terminals *UL/CSA (SO) 14 Ga. (.60 OD) Up To 50' Available
MOTOR (SINGLE PHASE)	3450 RPM. 60 Hz Includes Overload Protection In The Motor. Oil Filled, Class F PSC Permanent Split Capacitor
OPTIONAL SEAL FAILURE	20' Length Standard UL/ CSA (SJTW) 16/3 (.3300D)







Model	HP	Volts	Phase	Amps	Cord Length	Switch	Wt.
CPSTEP512(A)	1/2	115	1	13.8	20	Manual (Automatic)	72
CPSTEP522(A)	1/2	230	1	6.9	20	Manual (Automatic)	72
CPSTEP532	1/2	230	3	4.6	20	Manual	72
*CPSTEP542	1/2	460	3	2.3	20	Manual	72
CPSTEP1022(A)	1	230	1	10.4	20	Manual (Automatic)	75
CPSTEP1032	1	230	3	7.6	20	Manual	75
*CPSTEP1042	1	460	3	3.8	20	Manual	75
CPSTEP1522(A)	1-1/2	230	1	12.0	20	Manual (Automatic)	75
CPSTEP1532	1-1/2	230	3	8.4	20	Manual	75
*CPSTEP1542	1-1/2	460	3	4.2	20	Manual	75
CPSTEP2022(A)	2	230	1	14.8	20	Manual (Automatic)	75
CPSTEP2032	2	230	3	11.0	20	Manual	75
*CPSTEP2042	2	460	3	5.5	20	Manual	75

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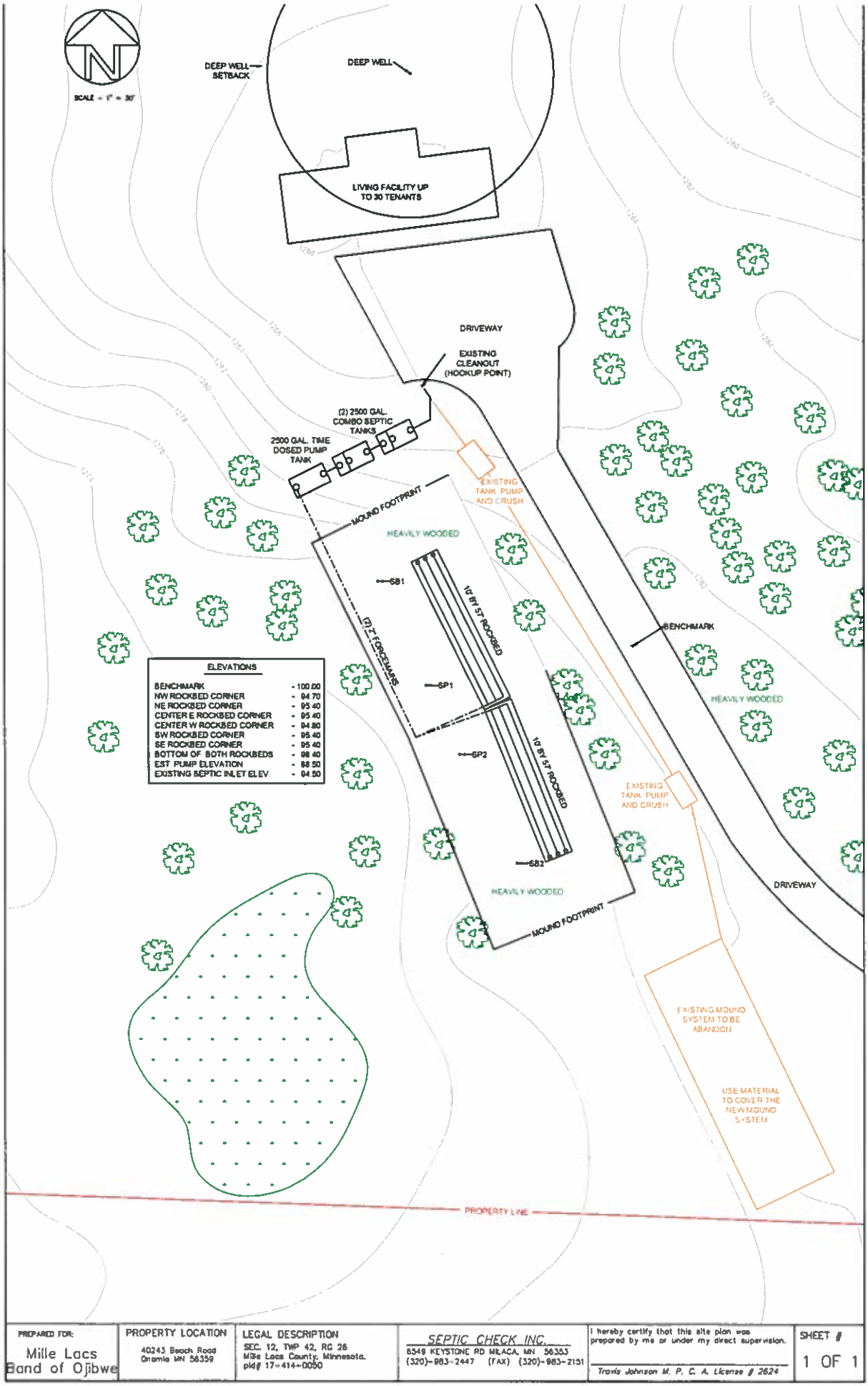

PREPARED FOR:	PROPERTY LOCATION	LEGAL DESCRIPTION			SHEET #
Mille Lacs Band of Ojibwe	40243 Beach Road Onamia MN 56359	SEC. 12, TWP 42, RG 26 Mille Lacs County, Minnesota. pid# 17-414-0050	SEPTIC CHECK, INC. 8548 KEYSTONE RD MILACA, MN 56353 (320)-983-2447 (FAX) (320)-983-2131	I hereby certify that this site plan was prepared by me or under my direct supervision. Travis Johnson M. P. C. A. License # 2624	1 OF 1