ST. LOUIS COUNTY BOARD OF ADJUSTMENT STAFF REPORT

INSPECTION DATE: 2/21/2024 **REPORT DATE: 2/26/2024** **MEETING DATE: 3/14/2024**

APPLICANT INFORMATION

APPLICANT NAME: Matt Massie

APPLICANT ADDRESS: 4133 Nelson Rd, Rice Lake, MN 55803

OWNER NAME:
(IF DIFFERENT THAN ABOVE)

SITE ADDRESS: 4133 Nelson Rd, Rice Lake, MN 55803

LEGAL DESCRIPTION: E 1/2 OF NW 1/4 OF SE 1/4 OF NE 1/4, S28, T51N, R14W (Rice Lake)

PARCEL IDENTIFICATION NUMBER (PIN): 520-0017-00140

VARIANCE REQUEST: The applicant is requesting relief from St. Louis County SSTS Ordinance 61 adopted Technical Standards 7080.2150, Subpart 2 (F), to allow a subsurface sewage treatment system installation at a reduced shoreline setback.

PROPOSAL DETAILS: The applicant is proposing to install a new septic tank, as part of a full replacement system, at a reduced shoreline setback of 100 feet where 150 feet on a Trout Stream is required.

PARCEL AND SITE INFORMATION

ROAD ACCESS NAME/NUMBER: Nelson Road

ROAD FUNCTIONAL CLASS: Public

LAKE NAME: N/A

LAKE CLASSIFICATION: N/A

RIVER NAME: Amity Creek

RIVER CLASSIFICATION: Trout Stream (TRO)

DESCRIPTION OF DEVELOPMENT ON PARCEL: There is a principal dwelling, accessory structure (garage), existing septic, and well.

ZONE DISTRICT: RES 1

PARCEL ACREAGE: 5.00 ACRES

LOT WIDTH: 332 FEET

FEET OF ROAD FRONTAGE: 332 FEET

FEET OF SHORELINE FRONTAGE: 425 FEET

PARCEL AND SITE INFORMATION

VEGETATIVE COVER/SCREENING: The property has good vegetative screening from the shoreline, roadway, and neighboring properties.

TOPOGRAPHY: Property has a descending slope northward toward Amity Creek.

FLOODPLAIN ISSUES: There is floodplain on the property but will not be impacted by the replacement SSTS.

WETLAND ISSUES: There appears to be wetland on the property but it will not be impacted by the replacement SSTS.

ADDITIONAL COMMENTS ON PARCEL: N/A

FACTS AND FINDINGS

A. Official Controls:

1. Ordinance 61 states that all SSTS components must be setback in accordance with Table VII of the SSTS Technical standards. The required setback for a trout stream is 150 feet. The applicant is proposing to install the tank at a reduced setback of 100 feet.

B. Practical Difficulty:

1. The location of the principal dwelling, plumbing, and landscape require the replacement septic tank to be installed within the setback.

C. Essential Character of the Locality:

1. The parcel is located within the City of Rice Lake zoning authority and is listed as RES-1
2. There have been no other similar variances within the surrounding area.

BOARD OF ADJUSTMENT CRITERIA FOR APPROVAL OF A VARIANCE

1. **Is the variance request in harmony with the general purpose and intent of official controls?**
2. **Has a practical difficulty been demonstrated in complying with the official controls?**
3. **Will the variance alter the essential character of the locality?**
4. **What, if any, other factors should be taken into consideration on this case?**

CONDITIONS

Conditions that may mitigate the variance for relief from St. Louis County SSTS Ordinance 61 adopted Technical Standards 7080.2150 Subpart 2 (F) to allow a septic tank installation at a reduced shoreline setback as proposed include, but are not limited to:

1. All other Onsite Wastewater SSTS standards shall be met.
2. Following system installation, an inspection shall be performed by a qualified inspector to ensure setbacks are met prior to issuing Certificate of Compliance.
3. All other local, county, state and federal regulations shall be met.

ST. LOUIS COUNTY, MN
PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT
(On-Site Wastewater Division)

Duluth
Government Services Center

320 West 2nd Street, Suite 301
Duluth, MN 55802
Phone (218) 725-5200
Toll Free (800) 450-9278

Virginia
Government Services Center
201 South 3rd Avenue West
Virginia, MN 55792
Phone (218) 749-0625
Toll Free (800) 450-9278

Permit Construction Application Subsurface Sewage Treatment System

General

- This permit application form is used to apply for a Permit to Construct. Additional information: www.stlouiscountymn.gov/septic

Enter the Primary PIN and Associated PIN (if applicable) of the property to be reviewed.
PIN is found on your Property Tax Statement. For example, 123-1234-12345. Primary PIN: Parcel where Structure/SSTS are located. Associated PIN: Additional and/or adjacent property that you own or that is related to the project.
County Land Explorer: https://www.stlouiscountymn.gov/explorer
Property Lookup: http://apps.stlouiscountymn.gov/auditor/parcelInfo2005Iframe

Primary PIN	**520-0017-00140**
Associated PINs	

Enter Applicant Information

I am a:	**Landowner**
Are you an LLC Business?	**No**
Applicant Name:	**MASSIE, MATT**
Address:	**4133 NELSON ROAD**
	--
City:	**RICE LAKE**
State:	**MN**
Zip:	**55803**
Primary Phone:	**--**
Mobile Phone:	**(218)390-6961**
Email:	**--**
Preferred Contact Method:	**Any**
Contact Person Name:	**--**
Contact Person Phone:	**--**

Property Owner Name and Contact Information.

If the property owner information we have on file is not correct, please enter the current owner information.

Property Owner Name:	**PETERS RICHARD L**

Site Address:	**4133 NELSON ROAD**
	--
City:	**RICE LAKE**
State/Province:	**MN**
Zip:	**55803**
Primary Phone:	**--**
Mobile Phone:	**--**
Email:	**--**
Preferred Contact Method:	**Any**
Contact Person Name	**--**
Contact Person Phone	**--**

Mailing Address Information

This address can default from the address you selected. If the values defaulted are not correct, please enter the correct information.

Same as Property address?	☐ **Yes**
Same as Applicant address?	☐ **Yes**
Name:	**PETERS RICHARD L**
Address:	**4133 NELSON ROAD**
	--
City:	**RICE LAKE**
State/Province:	**MN**
Zip:	**55803**
Primary Phone:	**--**
Mobile Phone:	**--**
Email:	**--**

Provide additional email recipients	☐ **Yes**

SITE INFORMATION

Enter Site information

Do you need to request a 911 address number and sign?	**No**
Is this a leased property?	**No**

Is this for Residential or Commercial?

Residential

Is the property used year round or used seasonally?

Year round

Is this project within 300 feet of a river/stream or 1,000 feet of a lake?

Yes

River/Lake Name **AMITY CREEK**

Is this property connected to a Common Interest Community?

No

Is this serving multiple dwellings sharing a SSTS component?

No

Is this related to a Point of Sale Requirement?

No

Is the SSTS located in a floodplain?

No

APPLICATION REASON

What are you applying for?	**Replacing the existing SSTS**
Explain why:	**FAILURE**
Permit Number (being replaced, if known):	**--**

WORKSHEET

Select the System Type

Type I System

"Type I System" means an ISTS that follows a standard trench, bed, at-grade, mound, or graywater system design in accordance with MPCA rules, Minnesota Rules, Chapter 7080.2200 through 7080.2240.

No

Type II System

"Type II System" means an ISTS with acceptable modifications or sewage containment system that may be permitted for use on a site not meeting the conditions acceptable for a standard Type I system. These include systems on lots with rapidly permeable soils or lots in floodplains and privies or holding tanks.

No

Type III System

"Type III System" means a custom designed ISTS having acceptable flow restriction devices to allow its use on a lot that cannot accommodate a standard Type I soil treatment and dispersal system.

Yes

System Type	**Mound System < 12"**
Note:	**MPCA Type III Systems must be installed by a licensed septic installation contractor.**

Type IV System

"Type IV System" means an ISTS, having an MPCA registered pretreatment device and incorporating pressure distribution

and dosing, that is capable of providing suitable treatment for use where the separation distance to a shallow saturated zone is less than the minimum allowed.

No

Type V System

"Type V System" means an ISTS, which is a custom engineered design to accommodate the site taking into account pretreatment effluent quality, loading rates, loading methods, groundwater mounding, and other soil and other relevant soil, site, and wastewater characteristics such that groundwater contamination by viable fecal coliforms is prevented.

No

Select the gallons per day (GPD) for the system.

Gallons per Day	**Less than 2,500 GPD**

WELL INFORMATION

Enter information about the well.

Do you have a proposed water source?

No

Enter # of existing water sources on the property

1

After completing the following information for the 1st water source, please use the Add Another Water Source button to add the additional water source(s) information.

Water Source Type	**Well**
Well #	**--**
Well Depth (Feet)	**--**
Case Depth (Feet)	**--**
Well Type	**--**

DESIGNER & INSTALLER INFORMATION

Select the Designer

Licensed Business Name or Designer Name	**Northern Environmental Solutions LLC**
License #	**4072**
Certification #	**--**
Designer's Comments (To On-Site Wastewater Staff)	**--**

Select the Installer (if known)

Licensed Business Name or Installer Name	**--**
License #	**--**
Certification #	**--**
Installer's Comments (To On-Site Wastewater Staff)	**--**

STRUCTURE - RESIDENTIAL

Enter Building Type and Water Uses
Home, mobile home, hunting shack, cabin, RV

Dwelling	**Yes**

Dwelling

# of Bedrooms	**3**
Plumbing	☑ **Yes**
Basement Plumbing	☑ **Yes**
Garbage Disposal	☐ **Yes**
Clothes Washer	☑ **Yes**
Dishwasher	☑ **Yes**
Water Conditioning Unit	☐ **Yes**
Furnace w/Humidifier	☐ **Yes**
Bathtub > 40 gal.	☐ **Yes**
Sewer Grinder Pump	☐ **Yes**
Multi-Family	**No**
Accessory Dwelling	**No**
Accessory Structure w/water	**--**
Other	**No**

Other information to be considered for this application
--

Will this project require a Septic Variance?
Yes

VARIANCE WORKSHEET

Enter Variance information. About SSTS Variances Pursuant to Ordinance 61, Article V, Section 3.0 A property owner may request a variance from the standards specified in the Ordinance pursuant to county policies and procedures. Variances shall only be permitted when they are in harmony with the general purposes and intent of this Ordinance where there are practical difficulties or particular hardship in meeting the strict letter of this Ordinance, excluding the technical standards. Certain deviations may require the approval of the MPCA or the MN Department of Health.

Describe the specific provision(s) in the ordinance from which the variance is requested.
Septic tank will be within setback of Amity Creek which is 150 feet.

Describe the practical difficulty that prevents compliance with the rule.
House was built in approximately 1995 with fully finished 9ft basement. Current septic runs out the back of the house towards the Amity Creek which is 111 ft away.

Describe the alternative measures that will be taken to achieve a comparable degree of compliance with the purposes and intent of the applicable provisions.
The septic tank will be within the setback, but the mound system will meet the 150 ft required setback.

Identify cost considerations preventing reasonable use of the property under the terms of this ordinance
Not filled in by applicant

OFFICE USE ONLY

ES Area	**JO-VARIANCE**
Office	**Duluth**
Section	**28**
Township	**51**
Range	**14**
Variance Department Recommendation	**--**

Specify reasons for recommendation:
Hint: (Reference pertinent sections of the Ordinance and ISTS Construction Standards)

--

Hearing Info. and Outcome	**--**
Board of Adjustment Hearing Date	**--**
Permit #	**--**
Variance Granted	**--**
Case #	**--**

VARIANCE AGREEMENT

By submitting this request for variance from the Ordinance and the Construction Standards, I certify and agree that no substantial health hazard is likely to occur therefrom and an unnecessary hardship might result in strict compliance with the Ordinance and Standards.
I further agree to install a sewage treatment system in accordance with the permit application, plans, and specification that are made as part of this variance request, in addition to paying the Variance Fee associated with this request.

St. Louis County, MN

VARIANCE

Variance Worksheet

Subsurface Sewage Treatment System

Fee $685.00
St. Louis County auditor

Form **3090** Rev. 03-2021

JAN 18 2024

About SSTS Variances Pursuant to Ordinance 61, Article V, Section 3.0

A property owner may request a variance from the standards specified in the Ordinance pursuant to county policies and procedures. Variances shall only be permitted when they are in harmony with the general purposes and intent of this Ordinance where there are practical difficulties or particular hardship in meeting the strict letter of this Ordinance, excluding the technical standards. Certain deviations may require the approval of the MPCA or the MN Department of Health.

Please Complete the Following Sections

Describe the specific provision or provisions in the ordinance from which the variance is requested.

Septic Tank will be within setback of Amity Creek which is 150ft.

Describe the practical difficulty that prevents compliance with the rule.

House was built in approximately 1995 with fully finished, 9ft basement. Current Septic runs out the back of the house towards Amity Creek which is 111 ft away.

Describe the alternative measures that will be taken to achieve a comparable degree of compliance with the purposes and intent of the applicable provisions.

Septic tank will be within the setback, but the mound system will meet the 150ft. required setback.

Identify cost considerations preventing reasonable use of the property under the terms of this ordinance.

AGREEMENT

By submitting this request for variance from the Ordinance and the Construction Standards, I certify and agree that no substantial health hazard is likely to occur therefrom and an unnecessary hardship might result in strict compliance with the Ordinance and Standards. I further agree to install a sewage treatment system in accordance with the permit application, plans, and specification that are made as part of this variance request, in addition to paying the Variance Fee associated with this request.

Mail to

201 South 3rd ave west

Virginia MN 55792

Mail Variance and permit together and Make out two(2) Seperate checks for Variance and permit.

Check to Mike Parrott
for 1200.00 payable to (NES)

3867 Sandberg Rd Duluth MN 55810

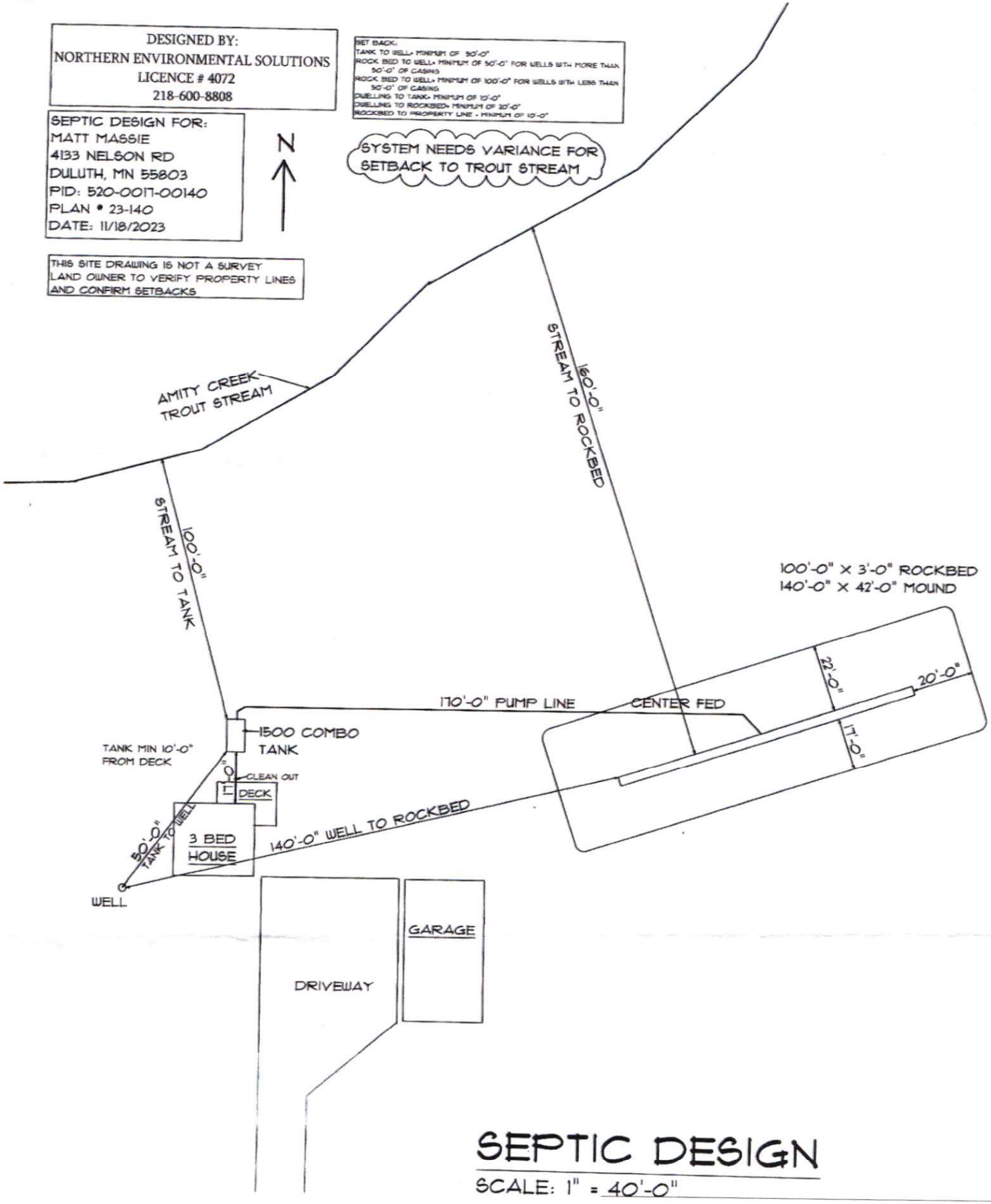
DESIGNED BY:
NORTHERN ENVIRONMENTAL SOLUTIONS
LICENCE # 4072
218-600-8808

SEPTIC DESIGN FOR:
MATT MASSIE
4133 NELSON RD
DULUTH, MN 55803
PID: 520-0017-00140
PLAN # 23-140
DATE: 11/18/2023

THIS SITE DRAWING IS NOT A SURVEY
LAND OWNER TO VERIFY PROPERTY LINES
AND CONFIRM SETBACKS

SET BACK:
TANK TO WELL- MINIMUM OF 50'-0"
ROCK BED TO WELL- MINIMUM OF 50'-0" FOR WELLS WITH MORE THAN 50'-0" OF CASING
ROCK BED TO WELL- MINIMUM OF 100'-0" FOR WELLS WITH LESS THAN 50'-0" OF CASING
DWELLING TO TANK- MINIMUM OF 10'-0"
DWELLING TO ROCKBED- MINIMUM OF 20'-0"
ROCKBED TO PROPERTY LINE - MINIMUM OF 10'-0"

SYSTEM NEEDS VARIANCE FOR SETBACK TO TROUT STREAM



SEPTIC DESIGN

SCALE: 1" = 40'-0"

Northern Environmental Solutions

SEPTIC DESIGNS | INSPECTIONS | INSTALLATIONS | LAND CLEARING | WATER TESTING

LICENSE #4072 PHONE 218-600-8808

Client: Matt Massie

Address: 4133 Nelson Rd

Duluth MN 55803

PID# 520-0017-00140

System Type: III Mound

Construction Notes: Septic site and alternative site must be protected. Prior to installation the County Must verify the soils and proposed septic site for this design to be valid. Gopher one must be called to locate utilities, all required setbacks must be met and verified prior to installation. All manhole covers must be to grade. It is the responsibility of the installer to verify that all required setbacks will be met prior to installing the system in this design. It is up to property owner to protect septic drain field sites (primary site and alternate site) from damage. Rope off area to be protected. Do not drive on sites with a wheeled vehicle of any type. Only a track type vehicle can be used. **All**

sewer pipe that runs under or through a driveway must be insulated and protected from frost. A clean out must be installed by the building and one added every 100 ft of pipe installed.

Please review the stakes I have placed on your property. The stakes indicate the location of drain field and tank area. I request that the property lines be verified to be 10 feet or more from the stakes.

It is up to property owner to preform maintenance on tank system by pumping

This design must be submitted for permit. Once local regulatory authority has issued a permit our responsibility for design is done.

Stakes are in place for the primary drain field area and marked. Any changes to be made should be done before approval of design.
Call 218- 600-8808 for changes.

Any changes to design will be at a cost for new design.

Any tree removal is up to homeowner to have removed. If this design is for a mound trees need to be cut to grade. Do not remove roots or stumps.
Before digging get locates! Gopher state one call 1-800-252-1166
Any results and /or information in this report are strictly the interpretation of the licensed individual issuing the report. All field work and test results are done to the best of the individual's ability, and under no circumstances is any work to be performed or action taken as a result of this report prior to full review and approval by the proper governing authorities.

Northern Environmental Solutions LLC
3869 Sandberg RD
Duluth MN 55810
LIC # 4072
218-600-8808

Construction notes: prepared for Matt Massie

This system is going to be a type III Mound.

Tank size: A new 1000 /500 combo septic/pump tank with alarm and block. All electric wiring needs to be protected around the pump and septic tanks. An event counter must be installed when type III is used.

All manhole lids bring to grade and secure.

Install inspection pipes all inspection must be 4" in diameter. Where needed, also install a clean out where needed in the supply line and end of laterals.

Pump: GPM 19 total head 21 feet:

All pumps piping, and controls must have access for servicing or replacement without entering the pump tank.

Piping: SCH 40 4'' or 3: house to septic tank 17' FT= field verify
SCH, 40 2'' pump tank to rock bed: 170' FT= field verify
From pump to tank place 2''SCH. 40 inside 4''SCH 40 help protect sagging of 2'' (5-10 FT)

Install insulated pipe across driveway, also place straw on all new construction to help prevent freezing.

MONITERING WILL NEED TO BE DONE:

SOILS MUST BE VERIFIED WITH THE COUNTY PRIOR TO THE INSTALLATION OF THIS SYSTEM!

It is up to the installer to receive and place clean material for mound and pressure bed construction accepting substandard material can cause the finished system to fail sooner!! Note: as built form, send to country. Fill out elevation form send to lug. Fill out abandonment form send to lug.

Make sure all water is diverted from mound and tanks,

All paperwork is included to send to LUG!!!!

Northern Environmental Solutions LLC
3869 Sandberg RD
Duluth MN 55810
LIC#4072
218-600-8808

Maintenance tips for new systems

The new system should be pumped after he first year.
(reason to see how your system is working and the pumping company can recommend how often your system should be pumped)

Alarms are put on systems for a reason to help the system owner avert back up into the home. Alarms should be checked each year when you change your smoke detectors battery. Ask your installer to show you how to check alarms (when an alarm goes off call for maintenance) \
Keep from driving on your system. (a riding lawn mower is excepted)
This is an option if you can put it somewhere else.
Do not put water softener water back wash into septic.
Do not put drain tile water into septic.
Do not put 90% furnace water into septic.

The last pages of design has information on management tasks of your new system.

St. Louis County, MN

PERMIT

Residential Construction Application

Subsurface Sewage Treatment System

Form **3000** Rev. 12-28-2021

This permit application form is used to apply for a Permit to Construct. Additional Information: www.stlouiscountymn.gov/septic.

PROPERTY IDENTIFICATION NUMBER (PIN) and **SITE**

Primary PIN	5 2 0 - 0 0 1 7 - 0 0 1 4 0	Associated PIN	- -

PIN is found on your Property Tax Statement (E.g. 123-1234-12345), searching the County Land Explorer at https://gis.stlouiscountymn.gov/landexplorer/, or searching the Property Lookup at http://apps.stlouiscountymn.gov/auditor/parcelInfo2005Iframe/.

Site Address **4133 Nelson Rd**	City **Duluth**	Zip **55803**

☐ Check to request a 911 address number and sign. Visit https://www.stlouiscountymn.gov/departments-a-z/sheriff/emergency/911-emergency#5143571-obtaining-a-911-address for addressing information.

APPLICANT (Property Owner)

Name **Matt Massie**			Date **11/18/2023**
Address **4133 Nelson Rd**	City **Duluth**	State **MN**	Zip **55803**
Email	Phone **218-390-6961**	Phone	

CONTACT (If Different than Applicant Above)

Name		
Email	Phone	Phone

MAILING INFORMATION (If Different than Site Address)

✓ US Mail	Address	City	State	Zip
☐ Email	Email			

REASON FOR APPLICATON

☐ New SSTS ✓ Replacing the Existing SSTS **Why Failed** ☐ Point of Sale Requirement

SYSTEM TYPE (refer to design summary) and **PERMIT FEES**

Type I		Type II		Type III		Type IV		Type V	
☐ Non-Shoreland	$310	☐ Holding Tank	$255	☐ System	$350	☐ System	$400	☐ System	$500
✓ Shoreland	$535	☐ Privy/Outhouse	$105	☐ Component Add/Replace	$205	☐ Component Add/Replace	$205	☐ Component Add/Replace	$205
☐ Component Add/Replace	$205	☐ Floodplain-Shoreland	$315						
		☐ Component Add/Replace	$205						

Please make checks payable to: St. Louis County Auditor

SITE INFORMATION *(Check all that apply)*

✓ Yes	☐ No	Is the SSTS within 1,000 feet of a lake or 300 feet of a river? **Lake/River Name Amity Creek**
✓ Yes	☐ No	Is the property used year round?
☐ Yes	✓ No	Is the property part of a CIC (Common Interest Community)? If yes, include the Associated PIN on this Application.
☐ Yes	✓ No	Is this property serving multiple dwellings sharing a SSTS component?
☐ Yes	✓ No	Is this leased property? If yes, you must obtain & attach the Lessor's written authorization for this project.

Leased From	☐ MN Power	☐ St. Louis County	☐ MN DNR	☐ US Forest Service	☐ Other

WELL INFORMATION *(Check all that apply)*

Water Source	☐ Proposed Well	✓ Existing Well	☐ Hand Carried	☐ Surface/Lake Water	☐ Municipal
Well Type	✓ Drilled	☐ Sandpoint	☐ Dug	Is there one or more wells? ✓ Yes ☐ No	
Well #		Well Depth Feet		Case Depth Feet	

St. Louis County, MN

PERMIT

Residential Construction Application

Subsurface Sewage Treatment System

Form **3000**

Rev. 12-28-2021

DESIGNER

Licensed Business Name **Northern Environmental Solutions**

License # **4072** | Certification # **1789**

Designer's Comments *(To On-Site Wastewater Staff)*

STRUCTURE

Building Type and Water Uses Check all that apply		# of Bedrooms	Seasonal Use Only	Plumbing	Basement Plumbing	Garbage Disposal	Clothes Washer	Dishwasher	Water Conditioning Unit	Furnace w/Humidifier	Bathtub > 40 gal	Sewer Grinder Pump
✓ Dwelling	Home, mobile home, hunting shack, cabin, RV	**3**	☐	✓	✓	☐	✓	✓	☐	☐	☐	☐
☐ Multi-Family	Multiple units		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐ Accessory Dwelling	Guest cottage, bunk house		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐ Accessory Structure	Garage, pole building, shed, sauna, gazebo screen-house	**0**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐ Other			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Other information to be considered for this application

AGREEMENT

By submitting this application, the entire contents of which are considered to be public data, I certify and agree that I am the owner or the authorized agent of the owner of the above property, and that all uses will conform to the provisions of St. Louis County. I further certify and agree that I will comply with all conditions imposed in connection with the approval of the application. Applicants may be required to submit additional property descriptions, property surveys, site plans, building plans and other information before the application is accepted or approved. ***Intentional or unintentional falsification of this application or any attachments thereto will make the application, any approval of the application and any resulting permit invalid.*** I authorize St. Louis County staff to inspect the property to review the application and for compliance inspections. Furthermore, by submitting this application, I release St. Louis County and its employees from any and all liability and claims for damages to person or property in any manner or form that may arise from the approval of the application or any related plans, the issuance of any resulting permit or the subsequent location, construction, alteration, repair, extension, operation or maintenance of the subject matter of the application.

CONTACT Planning and Community Development (On-Site Wastewater Division)

Duluth Office		**Virginia Office**	
Government Services Center 320 W 2nd Street, Suite 301 Duluth, MN 55802	Phone (218) 725-5200 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic	Government Services Center 201 South 3rd Avenue West Virginia, MN 55792	Phone (218) 749-0625 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic

OFFICE USE ONLY

Amount Paid	Paid by	Cash	Check #	Permit #
Revenue Code	Received By	☐ Mail ☐ IP	Date RIO	

St. Louis County, MN

PERMIT

SSTS Dwelling Classification Worksheet

Subsurface Sewage Treatment System

Form **3011**

Rev. 12-28-2021

This form is used to complete a SSTS Design. Additional Information: www.stlouiscountymn.gov/septic

SITE INFORMATION

Site Address **4133 Nelson Rd**	City **Duluth**	Zip **55803**	Parcel ID **520-0017-00140**

DWELLING INFORMATION

Dwelling dimensions (ft) **26** x **34**	Finished Square Feet **1768**
Number of Bedrooms **3**	Finished Square Feet per Bedroom **589**
Information provided by **owner**	

WATER USING DEVICES (check all that apply)

✓ Clothes Washing Machine	☐ Bathtub > 40 gallons
✓ Dishwasher	☐ Garbage Disposal
☐ Water Conditioning Unit	☐ Self-cleaning Humidifier in Furnace

CLASSIFICATION

☐ I	More than 800 finished square feet per bedroom and/or more than 2 water using devices
✓ II	Between 500 and 800 finished square feet per bedroom and not more than 2 water using devices
☐ III	Less than 500 finished square feet per bedroom and not more than 2 water using devices
☐ IV	Dwellings with wastewater systems designed under part 7080.2240

Extracted from SLC Ordinance 61 Technical Standards

7080.1860 DESIGN FLOW (GALLONS PER DAY).

TABLE IV

Classification of dwelling

	I**	II	III	IV
Number of bedrooms	Gallons per day			
2 or less	300	225	180	*
3	450	300	218	*
4	600	375	256	*
5	750	450	294	*
6	900	525	332	*

* Flows for Classification IV dwellings are 75 percent of the values as determined for Classification I, II, or III systems.

** Design flows for Class I dwellings wastewater systems with design flows at a minimum 100 gallons per day per bedroom must meet the requirements of 7080.2300, Item I.

For more than six bedrooms, the design flow is determined by the following formulas:

Classification I: Classification I dwellings are those with more than 800 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, or where more than two of the following water-use appliances are installed or anticipated: clothes washing machine, dishwasher, water conditioning unit, bathtub greater than 40 gallons, garbage disposal, or self-cleaning humidifier in furnace. The design flow for Classification I dwellings is determined by multiplying 150 gallons by the number of bedrooms.

Classification II: Classification II dwellings are those with 500 to 800 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, and where no more than two of the water-use appliances listed in Classification I are installed or anticipated. The design flow for Classification II dwellings is determined by adding one to the number of bedrooms and multiplying this result by 75 gallons.

Classification III: Classification III dwellings are those with less than 500 square feet per bedroom, when the dwelling's total finished floor area is divided by the number of bedrooms, and where no more than two of the water-use appliances listed in Classification I are installed or anticipated. The design flow for Classification III dwellings is determined by adding one to the number of bedrooms, multiplying this result by 38 gallons, then adding 66 gallons.

Classification IV: Classification IV dwellings are dwellings with wastewater systems designed under part 7080.2240.

St. Louis County, MN

PERMIT

SSTS Design Summary

Subsurface Sewage Treatment System

Form **3002** Rev. 07-27-2022

This form is used to complete a SSTS Design. Additional Information: www.stlouiscountymn.gov/septic

SITE INFORMATION

Site Address **4133 Nelson Rd**	City **Duluth**	Zip **55803**	Parcel ID **520-0017-00140**

DESIGNER

Name **Northern Environmental Solutions**		Date **11/18/2023**
Email **mparrott.nes@gmail.com**	Phone **218-600-8808**	Phone

SYSTEM INFORMATION

MPCA Type ☐ Type I ☐ Type II ✓ Type III ☐ Type IV ☐ Type V				Dwelling Classification ☐ I ✓ II ☐ III ☐ IV	
✓ Residential ☐ Commercial ☐ Seasonal ☐ Other				Well Casing Depth	**0**
# Bedrooms **3**	# Water using devices **2**	Total Finished Sq ft	**1768**	Sq ft / Bedroom	**589**
Design Flow **300**	Water Meter **No**	Pressure Test	**No**	Grinder or Disposal	**No**
CLR **3**	SLR **,6**	Limiting Soil Type	**Loam**	Limiting Layer Depth (in)	**6**

SSTS Flow Description

House to 1500 Combo tank to 3x100 ft rockbed

TANK INFORMATION

Type (Septic, Pump, Holding etc.)	Size (gallons)	Status (New, Existing)	Material (Precast, Plastic)	Alarm (Yes, No)	Insulated (Yes, No)	Bedded (Yes, No)	Building Sewer (Gravity, Pressure, Both)
Sreptic/pump	**1000/500**	**New**	**Precast**	**yes**	**no**	**Yes**	**Gravity**

Gallons per inch of pump tank **11.36**

Tank Installation & Pumping comments

DISTRIBUTION INFORMATION

☐ Gravity	☐ Drop Box ☐ Distribution Box				
✓ Pressure	Gal/Min **19**	Ft Head **21**	Pump Model **Must meet pump curve**		
✓ Event Counter ☐ ETM	Time Dose Panel **NO**		Timer On	Timer Off	
Max Dose **75**	Min. Dose **41.6**	Drainback **29.6**	Dose + Drainback **99.6**	Float Tether (in) **8.76**	

Manifold		Laterals	
Location ✓ Center	☐ End	Number **2**	Length (ft) **49**
Size (in) **2**		Size (in) **1.5**	
Insulated **NO**		Orifices	
		Size (in) **5/36**	# Per lateral **17**
		Spacing (in) **36**	Shields **no**

DRAINFIELD INFORMATION

Trench

Number	Width (ft)	Length (ft)	Media Type
Max Depth (in)	Rock (in)	Cover (in)	Sand Liner (in)

Bed

Number	Width (ft)	Length (ft)	Media Type
Max Depth (in)	Rock (in)	Cover (in)	Sand Liner (in)

At-Grade

Width (ft)	Length (ft)	Number	Up Berm (ft)	Down Berm (ft)

Mound

Number	**1**	Bed Width (ft)	**2**	Bed Length (ft)	**100**	Media Type	**rock**
Sand (in)	**36** to **37**	Rock (in)	**10**	Cover (in)	**18**	Total Width (ft)	**42**
Up Berm (ft)	**17**	Down Berm (ft)	**22**	Sand (yd^3)	**576**	Total Length (ft)	**140**

Registered Filter Product

Filter Class	☐ Intermittent/Single Pass	☐ Recirculating	☐ Subsurface Flow	☐ Other
Media Type	☐ Sand	☐ Peat	☐ Textile/Synthetic	☐ Constructed Wetlands

No. of Filters	Rock Bed Dimensions (ft) x	Bed Media Depth (in)

Manufacturer

Registered Aerobic Treatment System

Type	☐ Suspended Growth	☐ Fixed Film	☐ Sequencing Batch	☐ Other

Gallons/day	No. of Units	Disinfection (yes or no)	If yes, chermical or UV

Manufacturer

Designer Comments

CONTACT Planning and Community Development (On-Site Wastewater Division)

Duluth Office		**Virginia Office**	
Government Services Center 320 W 2nd Street, Suite 301 Duluth, MN 55802	Phone (218) 725-5200 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic	Government Services Center 201 South 3rd Avenue West Virginia, MN 55792	Phone (218) 749-0625 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic

Pump Selection for a Pressurized System - Single Family Residence Project

Parameters

Discharge Assembly Size	2.00	inches
Transport Length	170	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	None	
Max Elevation Lift	10	feet
Manifold Length	0	feet
Manifold Pipe Class	40	
Manifold Pipe Size	2.00	inches
Number of Laterals per Cell	2	
Lateral Length	49	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.50	inches
Orifice Size	5/32	inches
Orifice Spacing	3	feet
Residual Head	3.5	feet
Flow Meter	None	inches
'Add-on' Friction Losses	5	feet

Calculations

Minimum Flow Rate per Orifice	0.57	gpm
Number of Orifices per Zone	34	
Total Flow Rate per Zone	19.3	gpm
Number of Laterals per Zone	2	
% Flow Differential 1st/Last Orifice	1.5	%
Transport Velocity	1.9	fps

Frictional Head Losses

Loss through Discharge	0.7	feet
Loss in Transport	1.2	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.0	feet
Loss in Laterals	0.1	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	5.0	feet

Pipe Volumes

Vol of Transport Line	29.6	gals
Vol of Manifold	0.0	gals
Vol of Laterals per Zone	10.4	gals
Total Volume	39.9	gals

Minimum Pump Requirements

Design Flow Rate	19.3	gpm
Total Dynamic Head	20.5	feet

300 ÷ 4 = 75 GAL MAX Dose
use 70 GAL Dose

MIN Dose 41.6 GAL
DRAIN BACK 29.6 GAL
GPM 19
TDH 21

PumpData

Legend

System Curve:
Pump Curve:
Pump Optimal Range:
Operating Point:
Design Point:

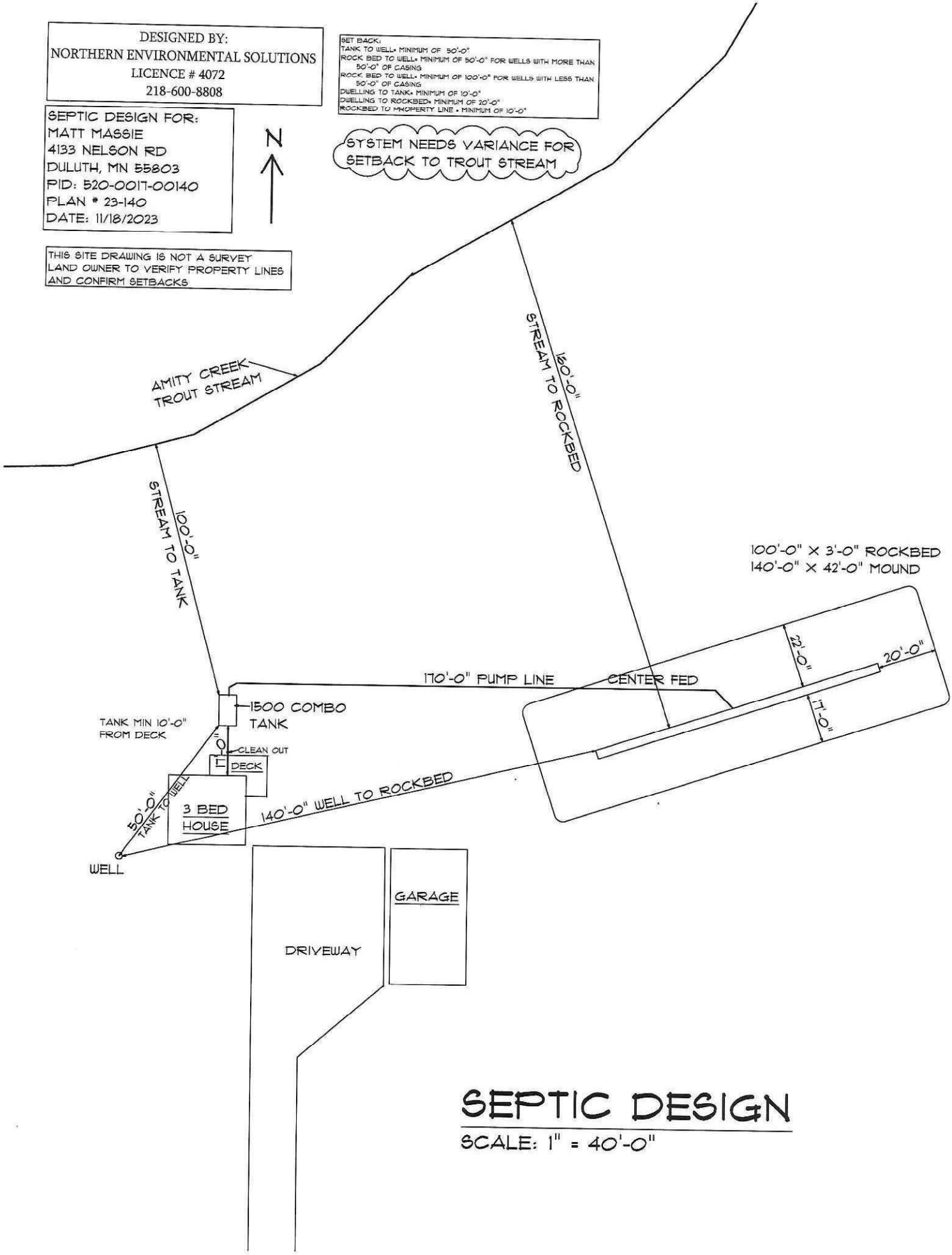
Orenco SYSTEMS
PROTECTING THE WORLD'S WATER

DESIGNED BY:
NORTHERN ENVIRONMENTAL SOLUTIONS
LICENCE # 4072
218-600-8808

SET BACK:
TANK TO WELL= MINIMUM OF 50'-0"
ROCK BED TO WELL= MINIMUM OF 50'-0" FOR WELLS WITH MORE THAN 50'-0" OF CASING
ROCK BED TO WELL= MINIMUM OF 100'-0" FOR WELLS WITH LESS THAN 50'-0" OF CASING
DWELLING TO TANK= MINIMUM OF 10'-0"
DWELLING TO ROCKBED= MINIMUM OF 20'-0"
ROCKBED TO PROPERTY LINE = MINIMUM OF 10'-0"

SEPTIC DESIGN FOR:
MATT MASSIE
4133 NELSON RD
DULUTH, MN 55803
PID: 520-0017-00140
PLAN # 23-140
DATE: 11/18/2023

THIS SITE DRAWING IS NOT A SURVEY
LAND OWNER TO VERIFY PROPERTY LINES
AND CONFIRM SETBACKS



SEPTIC DESIGN

SCALE: 1" = 40'-0"

Mound Calculations (Speadsheet)

Adjusted for Ordinance 61

Updated: 5/1/2023

Name of Applicant: Matt Massie

A. SITE CONDITIONS

Evaluate the site and soils report for the following:

>Type and occupancy of facility.
>Quality of wastewater distributed.
>Dimensions and configuration of suitable on site area.
>Treatment and hydraulic limitation of the soil
>Surface water movement.
(Note: shaded boxes to be filled in by designer)

Slope 3.0 %

Occupancy: One or two family dwelling # of bedrooms = 3 **Integer only**

Public facility (i.e. non-residential). Daily wastewater flow: gpd
(Provide details on flow estimate on separate sheet)

Wastewater: Typical residential BOD_5 Y/N = Y
Or other BOD_5 = mg/L

Suitable area: Cross slope distance = 200 Feet
Width = 100 Feet

Soil limiting factor = Concentration Depth to limiting factor = 0 inches

Contour loading rate = 3.0 gpd / linear foot Soil Loading Rate: 0.60

Berm Slope = 4.0 to 1.0

B. DESIGN WASTEWATER FLOW (DWF)

One or two family dwelling (7080 Flow by Class)

DWF = **gal/day/bedroom (SEE CHART I)** x # of bedrooms

100.00 gal/day/bedroom x 3 # of bedrooms

DWF = 300 gal/day **(use integer)**

OR:

Non-residential flow (Residential strength wastewater)

ATTACH flow analysis.

DWF GPD

OR:

Average Daily Flow (For Class I residences only)

ADWF = Average daily waste water flow (Generally 100 GPD)

ADWF = gal/day x bdrms # of bedrooms

ADWF = 0 Standard daily flow 0 gpd

C. DESIGN OF THE DISTRIBUTION CELL (ROCK BED)

1. Size of the Distribution Cell

a. Infiltration rate of fill material = [1] (generally < 1.0 gal/sf/day)

b. Bottom area of distribution cell = Design wastewater flow divided by infiltration rate (1.0 gal/sf/day)

Area = [300] gal/day divided by [1] gal/sf/day [300] sq. ft.

2. Standard Distribution Cell Configuration

a. Distribution cell length (B) = Design wastewater flow (DWF) divided by Contour Loading Rate (CLR)

Length = DWF [300] gals divided by CLR [3.0] gals/ft = [**100**] **ft = B**

b. Distribution cell width (A) = Bottom area of distribution cell divided by Distribution cell length (B)

Width = Bottom area [300] sf divided by length (B) [100] ft = [**3.0**] **ft = A**

(Note: A will generally be the same as the contour loading rate)

Length = [100] **Width =** [3.0] **Feet (Do Not exceed 10 feet)**

Cell dimensions when width ***exceeds*** 10 feet

Length = [0] **Width =** [0.0] **Feet**

Distribution Cell final size Standard Design

Length [**100**] **Feet** **Width=** [**3.0**] **Feet**

Width and length adjusted not to *EXCEED* 10 foot width

DISTRIBUTION CELL FOR AVERAGE FLOW DESIGN

a. Distribution cell length (B) = Average design wastewater flow (ADWF) divided by contour loading rate (CLR)

Length = ADWF [0] gals divided by CLR [3.0] gals/ft = [0] **ft = B**

b. Distribution cell width (A) = Bottom area of distribution cell divided by Distribution cell length (B)

Length = [**0**] **Feet** **Width =** [**0.0**] **Feet (Do Not exceed 10 feet)**

Cell dimensions when width ***exceeds*** 10 feet

Length = [**0**] **Feet** **Width =** [**0.0**] **Feet**

Distribution cell final size for Average Flow Design

Length = [**0**] **Feet** **Width =** [**0.0**] **Feet**

Width and length adjusted not to *EXCEED* 10 foot width

D. SAND FILL DESIGN

1. Fill depth

a. Fill depth below distribution cell (at least 6 inches)

1) Minimum depth at up slope edge of distribution cell (D) = [36] inches (minimum 36 inches for treatment and 12 inches for dispersal) minus distance in inches to limiting factor.

Required separation distance [36] (36 inches or 12 inches minimum)

minus [**0**] inches to saturated soil depth (from soils worksheet) =

sand depth requirement **D =** [**36**] **inches**

2) Depth at down slope edge of distribution cell (E)

E = depth at up slope edge of distribution cell (D) + (% natural slope expressed as a decimal x distribution cell width (A)

E = D + (% natural slope expresses as a decimal x A)

E = 36 Inches + (0.03 x 3.0 feet x 12 inches/foot)

E = 37 inches

b. Distribution Cell Depth of Aggregate (Rock Bed Depth)

Distribution cell depth (F) for aggregate distribution cell = amount of aggregate below distribution laterals (6 inches min.) + nominal outside diameter of largest lateral + amount of aggregate over distribution laterals (2 inches min.)

F = 6 6" min. + 2 inches + 2 (>2)inches

F= 10 inches

Aggregate under laterals: minimum 6 inches to 12 inches

c. Cover Material

1) Depth at distribution cell center (H) > 13 inches (crown)

2) Depth at distribution cell edges (G) = 12 inches

2. Mound Dimensions, fill length and width

a. End berm width (K) = Total fill at center of distribution cell x horizontal gradient of side slope.

K={([(D+E)divided by 2]+F+H)xhorizontal gradient of side slope}divided by 12inches/foot

K = 36.54 + 23 x 4.0 divided by 12

K = 20 feet

b. Mound Length (L) = Distribution cell length + (2 x end berm width)

L = B + 2K

L = 100.0 feet + 2 x 20 feet

L = 140

c. Up slope berm width (J) = Fill depth at upslope edge of distribution cell (D + F + G) x horizontal gradient of side slope x slope correction factor {100/[100 + (gradient of side slope x % of slope)]}

J = (36 inches + 10 Inches + 12 inches) divided by 12 inches/ft x 4.0 x 100 divided by 100 + (4.0 x 3.0)

J = 17 feet

d. Down slope berm width (I) = Fill depth at downslope edge of distribution cell (E + F + G) x Horizontal gradient of side slope x downslope correction factor 100/[100 - (gradient of side slope x % of slope)]

I = (E + F + G) x Horizontal gradient of side slope x downslope correction factor 100 divided by [100 - (gradient of side slope x % of slope)]

I = 37.08 inches + 10 Inches + 12 Inches) divided by 12in/ft x 4.0 x 100 divided by [100 -(4.0 x 3.0)]

I = 22 feet

e. Mound width (W) = Up slope width (J) + Distribution cell width (A) + Downslope width (I)

W = J + A + I

W = 17 ft + 3.0 ft + 22 ft

W = 42 feet

3. Check the basal area

a. Basal area required = Daily wastewater flow divided by infiltration rate of in-situ soil

300 gal/day divided by [ ] gal/sf/day

#DIV/0! square feet required

b. Basal area available

1) **Sloping site** = Cell length x (Distribution cell width + Down slope width)

Basal area = B (A + I)

Basal area = 100 ft x (3.0 ft + 22 ft)

Basal area = 2500.0 sf

2) **Level site** = Distribution cell length x Fill width

Level site = B x W

Level site = 100 ft x 42 ft

Level site = 4200.0 sf

c. Is available basal area sufficient? [ ] yes or [ ] no

Basal area required < Basal area available

#DIV/0! sf < [ ] sf

4. Determine the location of observation pipes along the length of distribution cell.

Distance from end of distribution cell to end observation pipes = B divided by 6

Distance = 17.0 ft from ends of distribution cell.

E. SAND VOLUME CALCULATIONS

1. Estimated Sand = [sand beneath rock bed]+ [sand in downhill berm] + [sand in uphill berm]
+ [sand in end berms] x (1cubic yard/27 cubic feet)

2. Estimated Sand = (D + E ÷ 12 x B x A ÷ 2) + (E+12 ÷ 12 x L x I) + (D ÷ 12 x J x L ÷ 2) + (D ÷ 12 x A x K) ÷ 27

3. Estimated Sand = 461 cubic yards

4. Adjusted Sand Volume = Estimated sand x correction factor.

5. Adjusted Sand Volume = 461 x1.25 = 576 cubic yards

MOUND ABSORPTION

Mound Absorption Ratio = Mound Design Loading Rate ÷ Soil Loading Rate

1.00 ÷ 0.60 = 1.67

Mound Absorption Width = (bed width or contour loading rate) x Mound Absorption Ratio

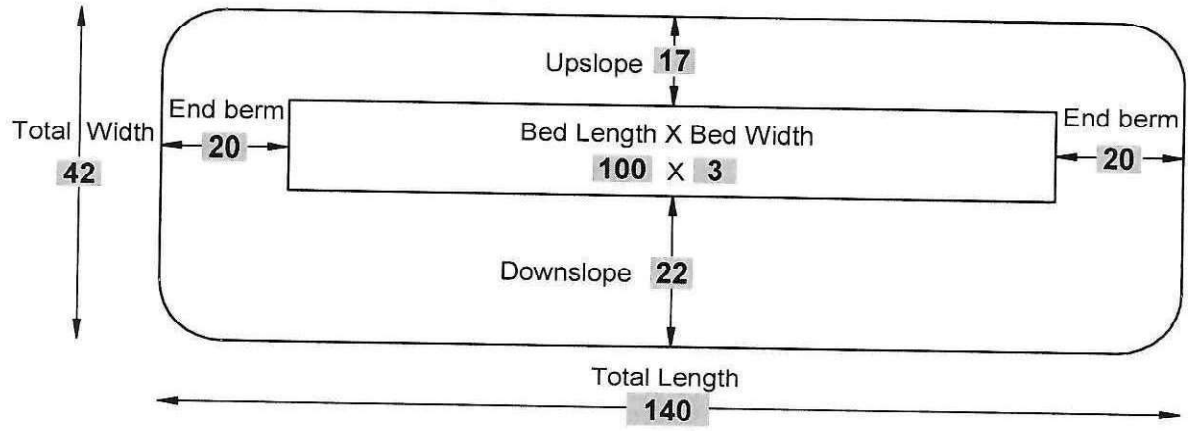
3.0 X 1.67 = **5.00 Feet**

<1% Slope absoprtion length on both sides of bed width = **1.00 Feet**

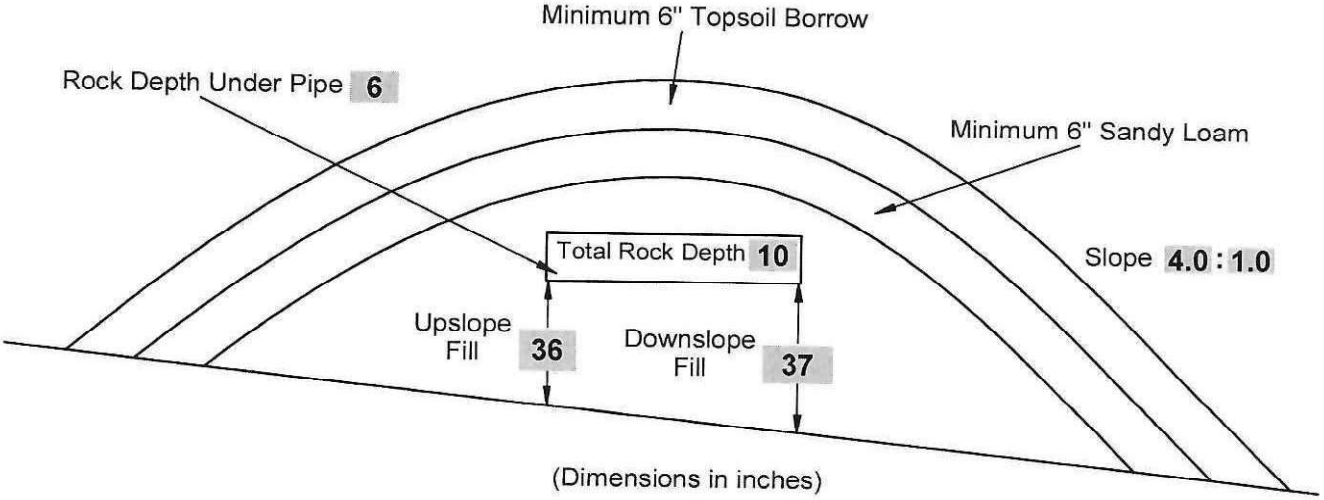
>1% Slope absorption length on downslope = **2.00 Feet**

Mound Dimensions

Name of Applicant: Matt Massie



(Dimensions in feet)



(Dimensions in inches)

Estimated Sand Volume: 576 Cubic Yards

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2019

Client:	Matt Massie	Location / Address:	4122 Nelson Rd Duluth MN 55803

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope		Slope shape	Linear, Concave
Vegetation: Forest	Soil survey map units: h2tb	Slope %: 3.0	Elevation:
Weather Conditions/Time of Day:	Sunny 3:00 PM	Date	11/18/23
Observation #/Location:	SP1	Observation Type:	Auger

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-6	Sandy Loam	<35%	7.5YR 3/3		None	None	Blocky	Moderate	Friable
6-8	Sandy Loam	<35%	7.5YR 3/4	7.5YR 4/6	Concentrations	S1	Blocky	Moderate	Friable

Comments

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

Mike Parrott/ NES		4072	11/18/2023
(Designer/Inspector)	(Signature)	(License #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.01.2019

Client:	Matt Massie	Location / Address:	4122 Nelson Rd Duluth MN 55803

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope | Slope shape: Linear, Concave

Vegetation:	Forest	Soil survey map units: h2tb	Slope %: 3.0
Elevation:			

Weather Conditions/Time of Day:	Sunny 3:15 PM	Date	11/18/23
Observation #/Location:	SP2	Observation Type:	Auger

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-6	Sandy Loam	<35%	7.5YR 3/3		None	None	Blocky	Moderate	Friable
6-8	Sandy Loam	<35%	7.5YR 3/4	7.5YR 4/6	Concentrations	S1	Blocky	Moderate	Friable

Comments

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

Mike Parrott/ NES		4072	11/18/2023
(Designer/Inspector)	(Signature)	(License #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2019

Client:	Matt Massie	Location / Address:	4122 Nelson Rd Duluth MN 55803

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope | Slope shape: Linear, Concave

Vegetation: Forest	Soil survey map units: h2tb	Slope %: 3.0	Elevation:

Weather Conditions/Time of Day:	Sunny 3:30 PM	Date	11/18/23

Observation #/Location:	SP3	Observation Type:	Auger

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-6	Sandy Loam	<35%	7.5YR 3/3		None	None	Blocky	Moderate	Friable
6-8	Sandy Loam	<35%	7.5YR 3/4	7.5YR 4/6	Concentrations	S1	Blocky	Moderate	Friable

Comments

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

Mike Parrott/ NES		4072	11/18/2023
(Designer/Inspector)	(Signature)	(License #)	(Date)

St. Louis County, Minnesota, Duluth Part

F135A—Hermantown-Canosia-Giese, depressional, complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: h2tb
Elevation: 1,150 to 1,800 feet
Mean annual precipitation: 28 to 31 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 80 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hermantown and similar soils: 40 percent
Canosia and similar soils: 35 percent
Giese, depressional, and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hermantown

Setting

Landform: Flats on moraines, rises on moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy material over dense loamy till

Typical profile

A - 0 to 4 inches: silt loam
E - 4 to 7 inches: silt loam
Bw - 7 to 31 inches: gravelly sandy loam
2Bw,2BC - 31 to 53 inches: gravelly sandy loam
2BCd - 53 to 80 inches: gravelly sandy loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 30 to 60 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F093AY013MN - Loamy Upland

Forage suitability group: Level Swale, Acid (G093AN005MN)
Other vegetative classification: Level Swale, Acid (G093AN005MN)
Hydric soil rating: No

Description of Canosia

Setting

Landform: Depressions on moraines, flats on moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy material over dense loamy till

Typical profile

A - 0 to 5 inches: loam
Bw - 5 to 25 inches: gravelly sandy loam
2Bw,2BC - 25 to 34 inches: gravelly sandy loam
2BCd - 34 to 80 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 30 to 60 inches to densic material
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F093AY007MN - Wet Loamy - correlated to F093AY006MN
Forage suitability group: Level Swale, Acid (G093AN005MN)
Other vegetative classification: Level Swale, Acid (G093AN005MN)
Hydric soil rating: Yes

Description of Giese, Depressional

Setting

Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy material over dense loamy till

Typical profile

Oa - 0 to 1 inches: muck
A - 1 to 6 inches: silt loam
Eg,E - 6 to 11 inches: silt loam
Bg,Bw - 11 to 30 inches: gravelly sandy loam

2Bw,2BC - 30 to 36 inches: gravelly sandy loam
2BCd,2Cd - 36 to 80 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 30 to 60 inches to densic material
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F093AY006MN - Depressional Wet Hardwood Forest
Forage suitability group: Not Suited (G093AN024MN)
Other vegetative classification: Not Suited (G093AN024MN)
Hydric soil rating: Yes

Minor Components

Twig, depressional

Percent of map unit: 5 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F093AY006MN - Depressional Wet Hardwood Forest
Other vegetative classification: Not Suited (G093AN024MN)
Hydric soil rating: Yes

Normanna

Percent of map unit: 5 percent
Landform: Rises on moraines
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F093AY014MN - Clayey Upland
Other vegetative classification: Sloping Upland, Acid (G093AN006MN)
Hydric soil rating: No

Data Source Information

Soil Survey Area: St. Louis County, Minnesota, Duluth Part
Survey Area Data: Version 21, Sep 10, 2023

UNIVERSITY
OF MINNESOTA

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	Matt Massie	Email	
Property Address	4133 Nelson Rd Dulut MN 55803	Property ID	520-0017-00140
System Designer	Mike Parrott/ NES	Contact Info	218-600-8808
System Installer	Medows Inc	Contact Info	218-428-6664
Service Provider/Maintainer		Contact Info	
Permitting Authority	St Louis County	Contact Info	218-725-5200
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.

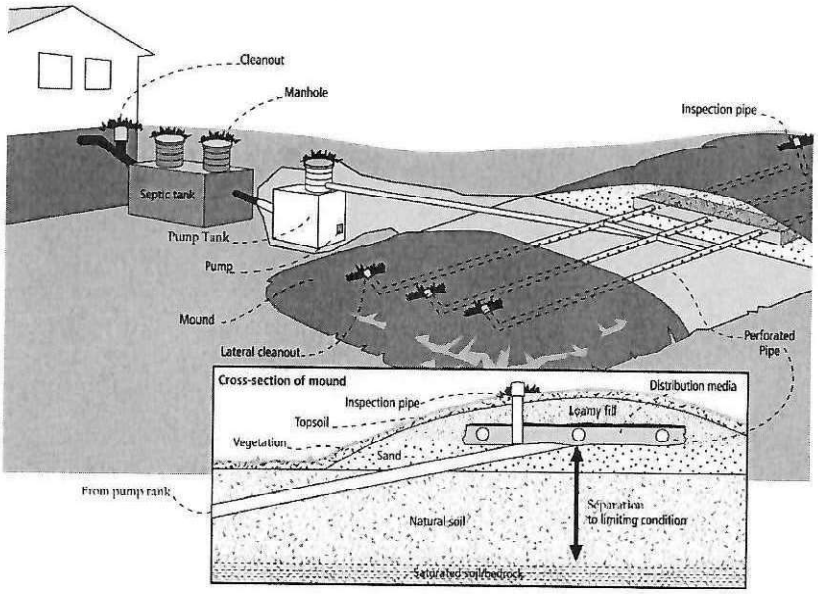
For more information see http://septic.umn.edu

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: 3

System capacity/ design flow (gpd): 300

Anticipated average daily flow (gpd): 210

Comments _____

Business? : ◉ Y ○ N What type? _____

Well Construction

Well depth (ft): NA

- ☐ Cased well Casing depth: NA
- ☐ Other (specify): _____

Distance from septic (ft): 140

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

Septic Tank

- ☐ First tank *Tank volume:* 1000 *gallons*
  Does tank have two compartments? ○ Y ◉ N
- ☐ Second tank *Tank volume:* _____ *gallons*
- ☐ Tank is constructed of _____
- ☐ Effluent screen: ◉ Y ○ N Alarm ◉ Y ○ N

- ☐ Pump Tank 500 *gallons*
- ☐ Effluent Pump *make/model:* _____
  Pump capacity 19 GPM
  TDH 21 Feet of head
- ☐ Alarm location at pump

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 3 ft x 100 ft

Rock bed size (width x length): 42 ft x 140 ft

Location of additional STA: _____

Type of distribution media: rock

☑ Inspection ports ☑ Cleanouts

☐ Surface water diversions

☐ Additional STA not available

Homeowner Management Tasks

These op*eration and maintenance ac*tivities 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 36 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: 99.6 gallons: Pump run time: 5.2 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:

"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: Mlke Parrott/ NES Certification # 1789

Permitting Authority: St Louis County

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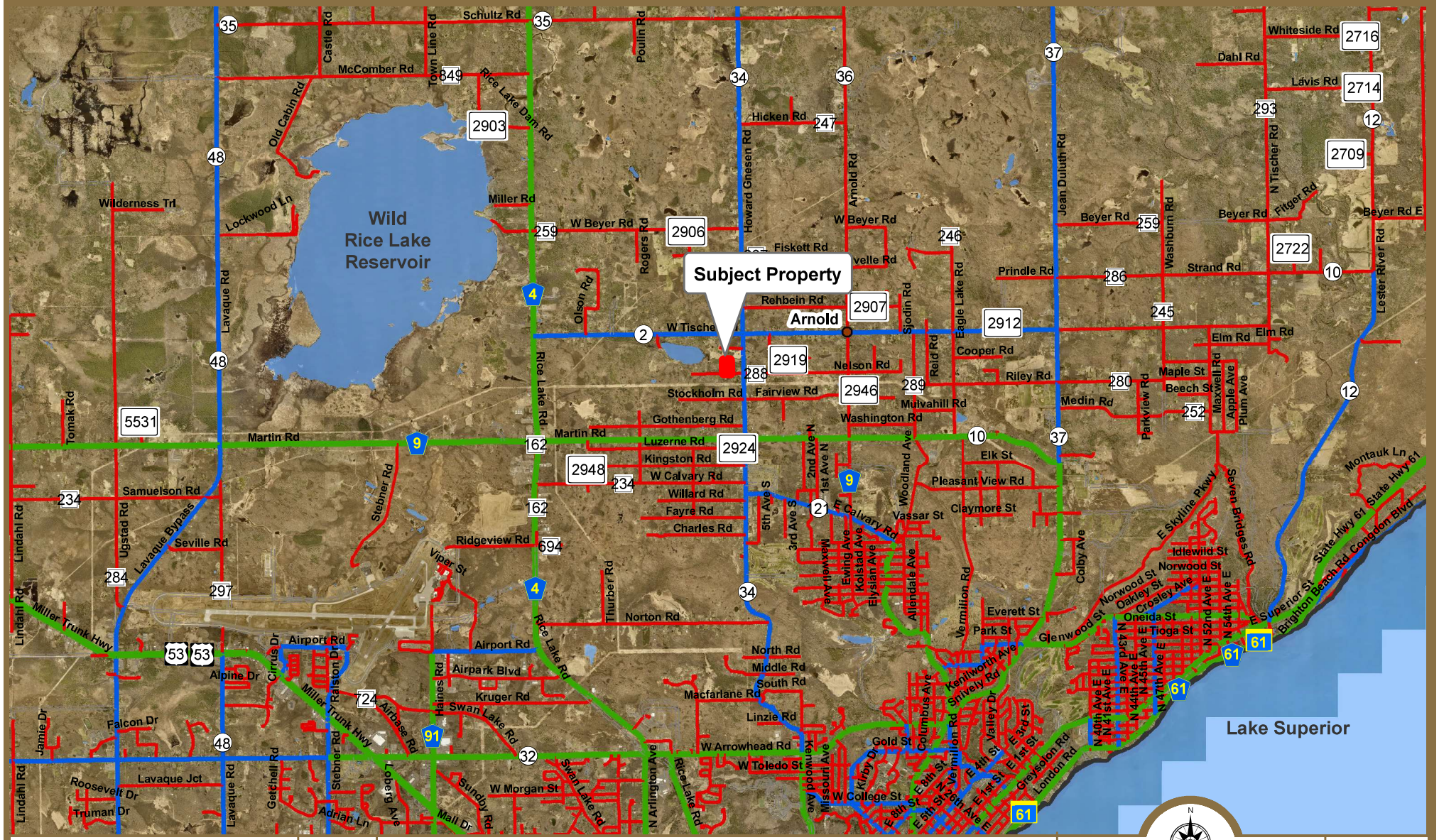
St. Louis County

March BOA Meeting



Prepared By: **Planning & Zoning Department**
(218) 725-5000
www.stlouiscountymn.gov

Source: St. Louis County

Map Created: 2/15/2024

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Matt Massie

Location Map

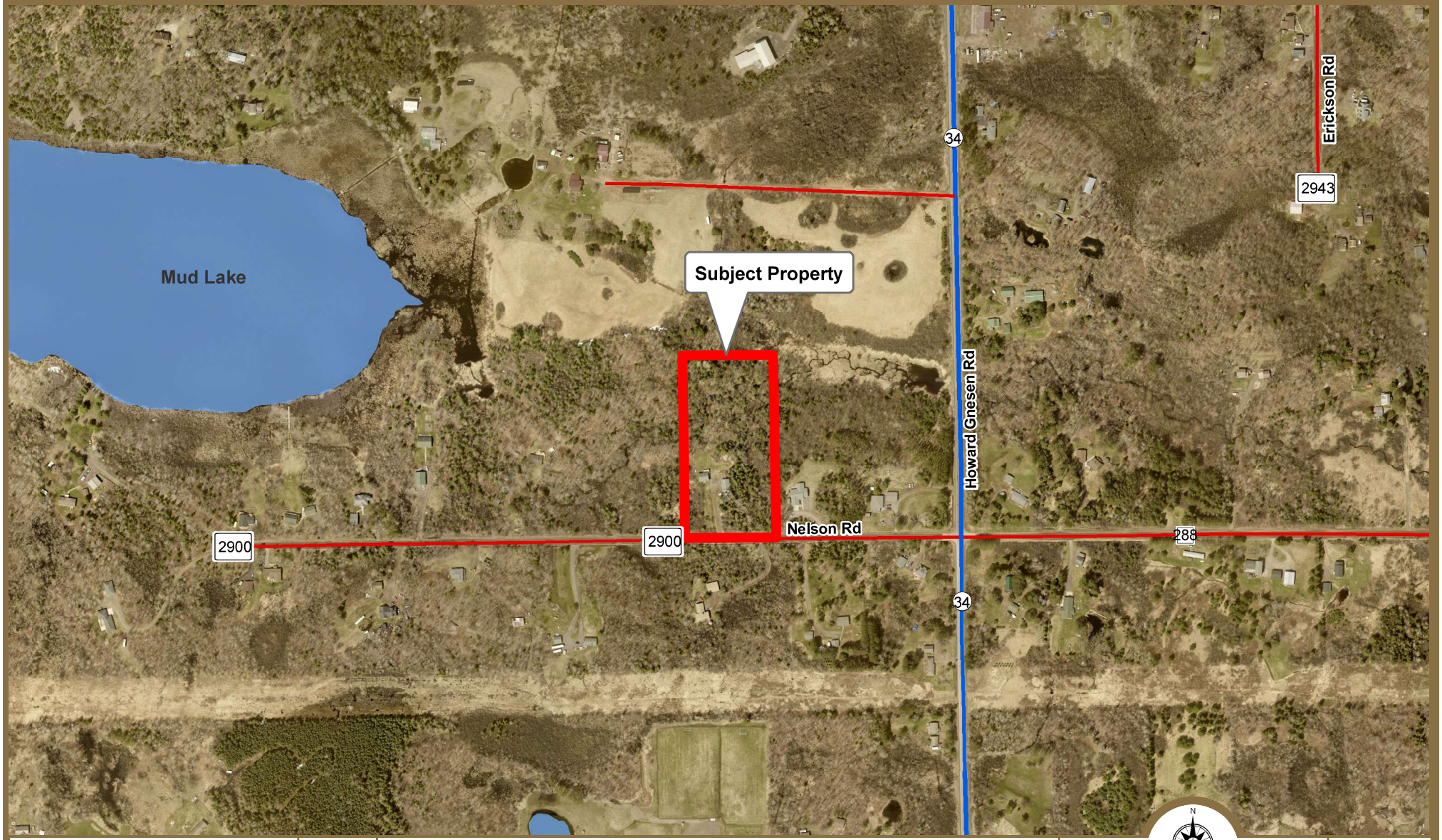
520-0017-00140

0 0.75 1.5
Miles

St. Louis County MN

St. Louis County

March BOA Meeting



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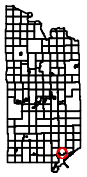

Matt Massie

Location Map

520-0017-00140

N

0 300 600

Feet

St. Louis County MN

St. Louis County

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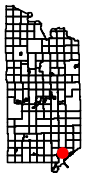

Matt Massie

Site / Elevation Map

520-0017-00140

0 80 160

Feet

St. Louis County MN