



## **STAFF REPORT**

DATE: 07/24/2023

REGULAR

ITEM#: 4a – PUBLIC HEARING

MOTION

**TO:** Planning Commission  
**FROM:** Sophia Jensen, City Planner  
**AGENDA ITEM:** **Variance Request – 8286 Hidden Bay Court**

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### **INTRODUCTION:**

Jeff and Judy Otto (Applicants) submitted a variance application for three deviations from the City's Shoreland Management Overlay District Code Section 105.12.1260 Table 17-3. The three requests are: 1) an increase in impervious surface for unsewered shoreland lots 2) A reduced ordinary high water level setbacks for a new home 3) A reduced ordinary high water level setback for a new septic system. These requests are for the property located at 8286 Hidden Bay Court North (Subject Property).

Two of the variance requests are associated with the construction of a new single family home (3,583.33 sq. ft.) and driveway (1,775.72 sq. ft.). The existing home (2,055.59 sq. ft.) and driveway (1,775.72 sq. ft.) is considered a legal nonconformity because it is within the 100 foot ordinary high water level setback, and because the impervious surface maximum for unsewered shoreland lots is exceeded. The applicant could remodel and repair the existing home, within the existing footprint, without the need for the structure setbacks and impervious surface variance requests. The requests were made because of the applicants feel the home is outdated and it does not meet their desire to age-in-place with single level living. They are proposing to demolish the existing home and build a new larger house that would exceed the City Shoreland Requirements.

The third variance request is associated with the septic system. The system is currently failing and the applicant needs to replace it. The existing septic is considered a legal nonconformity because it is within the 75' ordinary high water level setback for septic systems. The applicant is proposing to move the new septic location closer to the water which would require a variance.

When legal nonconformities are expanded or intensified they should be brought into compliance with current code requirements, not further deviated from. Below is a table outlining the required criteria, the existing conditions, and what the applicant is proposing:

	Required	Existing	Proposed
Impervious Surface Coverage – Unsewered Lot	<b>15%</b>	18.3%	<b>21.8%</b>
Structure Setback from OHWL	<b>100'</b>	47.3'	<b>36.9'</b>
Septic Setback from OHWL	<b>75'</b>	51.3'	<b>38.3'</b>

### **ISSUE BEFORE PLANNING COMMISSION:**

The Planning Commission is being asked to hold a public hearing, review, and make a recommendation on the three variance requests.

**VARIANCE REQUEST DETAILS/ANALYSIS:**

<i>Address:</i>	8286 Hidden Bay Court North
<i>PID:</i>	09.029.21.23.0013
<i>Variance Requests:</i>	The applicant is seeking deviations from LEC 105.12.1260 Table 17-3 which allows unsewered lots a maximum impervious surface coverage of 15%, requires structure setback from the OHWL to be 100 feet, and requires septic system setbacks from the OHWL to be 75 feet.
<i>Existing Zoning:</i>	Rural Single Family, Shoreland Overlay District, Valley Branch Watershed District
<i>Surrounding Zoning:</i>	North: Rural Single Family South: Rural Single Family East: Rural Single Family West: Rural Single Family
<i>Deadline for Action:</i>	Application Complete – 6/9/2023 60 Day Deadline – 8/8/2023 120 Day Extension - 10/7/2023 Article V - Zoning Administration and Enforcement
<i>Applicable Regulations:</i>	Article XI – Rural Districts Article XIX – Shoreland Overlay District

**REVIEW AND ANALYSIS/DRAFT FINDINGS:**

An applicant must establish and demonstrate compliance with the variance criteria set forth in Lake Elmo City Code Section 105.12.320 before the City may grant an exception or modification to city code requirements. These criteria are listed below, along with comments from Staff about the applicability of these criteria to the applicant's request.

- 1) Practical Difficulties.** A variance to the provision of this chapter may be granted by the Board of Adjustment upon the application by the owner of the affected property where the strict enforcement of this chapter would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter. Definition of practical difficulties - "Practical difficulties" as used in connection with the granting of a variance, means that the property owner proposes to use the property in a reasonable manner not permitted by an official control.

***IMPERVIOUS SURFACE FINDINGS:*** *The applicant argues that the existing lot is too small to construct a new home and driveway that meets their desire to age-in-place and meet impervious surface requirements. Staff finds that the existing home/driveway could be remodeled or refurbished without the need for a variance since it is a legal nonconformity. Otherwise, the lot could fit a smaller home and driveway within impervious surface requirements. The discrepancy here is that the applicants are proposing a new larger home and driveway than code dictates, not that a home on this lot is not possible. **Practical Difficulties are not met.***

**REDUCED STRUCTURE SETBACK FINDINGS:** While a single family home is consistent with the zoning district. Staff finds that the complete demolition and reconstruction of a larger home and desire for a deck when an existing legal nonconforming home is already on site does not meet the practical difficulties requirement. **Practical Difficulties are not met.**

**REDUCED SEPTIC SETBACK FINDINGS:** The current system is failing and the applicant has had a septic designer review the property for a feasible septic location. Staff finds that the applicant has proven practical difficulties since a septic is needed given the current failing system and there is no other feasible area on site. **Practical Difficulties are met.**

- 2) **Unique Circumstances.** The plight of the landowner must be due to circumstances unique to the property not created by the landowner.

**IMPERVIOUS SURFACE FINDINGS:** The applicant argues that they need the main level garage and hammerhead driveway exactly as they proposed for safe access which would cause the impervious surface to increase. Staff finds that the reasoning for the garage and hammerhead driveway insufficient; the residence is at the end of a road where ample or fast moving traffic does not appear to be an impending safety concern. The applicant has the opportunity to refurbish the existing home, garage, and driveway footprint without the need for a variance. By completely redesigning the garage and driveway the applicant is creating the plight which they are requesting flexibility from. **Unique Circumstances are not met.**

**REDUCED STRUCTURE SETBACK FINDINGS:** The applicant argues that the setbacks are excessively large on this property, and a portion of the property is below the ordinary high water level, leaving a small buildable area for a new home. Staff finds that these requirements are in place to protect the waterbody and prevent damage to structures. Many properties have land that fluctuates over or under the ordinary high water level based on environmental factors, these areas may be subject to flooding or act as a wetland buffer. The ordinary high water level setbacks apply to all properties on the designated water body and not unique to this lot. Given that the applicant is proposing to demolish the existing legal nonconforming home and is then requesting flexibility to move the structure closer they are creating the plight they are requesting flexibility from. **Unique Circumstances are not met.**

**REDUCED SEPTIC SETBACK FINDINGS:** The applicant is proposing to replace the septic in roughly the same area of the property as the existing system. Again due to the fact this is a failing system, and the only location for a septic on the property **Unique Circumstances are met.**

- 3) **Character of Locality.** The proposed variance must not alter the essential character of the locality in which the property in question is located.

**IMPERVIOUS SURFACE FINDINGS:** The applicant argues that the neighboring homes also exceed the imperious surface requirement and the single level house would be more accommodating to neighboring view sheds. Staff finds that many of the surrounding homes were build many years ago when different impervious surface and ordinary high water level regulations may have been in place. The request, if approved, would alter character of

locality by deviating from the City and DNR requirements put in place to protect the waterbody and structures built around them. **Character of Locality is not met.**

**REDUCED STRUCTURE SETBACK FINDINGS:** The applicant argues that that many of the neighboring homes are within the required structure setback from the ordinary high water level. Staff finds that many of the surrounding homes were build many years ago and different setback and ordinary high water level regulations may have been in place. The City's shoreland ordinance (105.12.1260(12)(c)) has exception for legal nonconforming buildings, where if structures exist on the adjoining lots on both sides of a proposed building site, structure setbacks may be altered without a variance to conform to the adjoining setbacks from the ordinary high water level. The existing home is already closer to the ordinary high water level than the adjacent structure to the west and the east side does not have a structure. The request, if approved, would alter character of locality by deviating from the City and DNR requirements put in place to protect the waterbody and the structures built around them. **Character of Locality is not met.**

**REDUCED SEPTIC SETBACK FINDINGS:** Given this area does not have access to City Sewer and all adjacent properties are on private systems; Staff finds that approval of this request would not alter essential character of the neighborhood. **Character of Locality is met.**

- 4) **Adjacent Properties and Traffic.** The proposed variance must not impair an adequate supply of light and air to properties adjacent to the property in question or substantially increase the congestion of the public streets or substantially diminish or impair property values within the neighborhood.

**IMPERVIOUS SURFACE FINDINGS:** The impervious surface increase should not increase congestion on a public street or negatively impair adjacent properties. **Adjacent properties and Traffic is met.**

**REDUCED STRUCTURE SETBACK FINDINGS:** The reduced structure setback should not increase congestion on a public street or negatively impair adjacent properties. **Adjacent properties and Traffic is met.**

**REDUCED SEPTIC SETBACK FINDINGS:** The proposed septic location should not increase congestion on a public street or negatively impair adjacent properties. **Adjacent properties and Traffic is met.**

#### **CITY AGENCY REVIEW:**

This request was distributed to several departments and agencies for review on June 12<sup>th</sup> 2023. The following departments provided comments on the variance request.

- City Engineer Email (6/20/2023) provided no additional comments.
- Fire Department Email (6/22/2023) provided comments regarding the address numbers of the home. This condition would be applied if the structure related variances are approved.



- Valley Branch Watershed District (6/26/2023) provided comments scrutinizing the request. The applicants would need to raise the low floor elevation to be at least 2 feet higher than the OHWL. A minimum 35-foot-wide buffer strip measured perpendicular to the OHWL extending 35 feet inland is required. A mowed access path and shoreline are allowed but must not exceed 30% of the landowner's shoreline width or 30 feet, whichever is less. The watershed encourages stormwater management although it is not required. Lastly, they are requiring temporary erosion controls to be in place. These conditions related to the structure would be applied if the structure related variances are approved. The 35 foot buffer strip would be applied if any of the variances are approved.
- MN DNR Email (6/30/2023) provided commentary scrutinizing the proposal. The DNR was concerned regarding tree removal since the trees act as screening buffer and habitat for wildlife. The DNR was also concerned regarding the request for an increase in impervious surface and recommended the driveway remain as-is. (This recommendation would support staff's findings listed above on the impervious surface request). The tree replacement condition would be applied if the structure related variances are approved.

#### **PUBLIC COMMENT:**

A hearing notice was sent to surrounding properties on July 12<sup>th</sup> 2023. A hearing notice was published in the local newspaper on July 14<sup>th</sup> 2023. Public comment received is attached to the report.

#### **FISCAL IMPACT:**

None

#### **RECOMMENDED CONDITIONS OF APPROVAL – SEPTIC REQUEST ONLY**

1. The applicant must obtain all other necessary City, State, and other governing body permits and approvals prior to construction.
2. A minimum 35-foot-wide buffer strip measured perpendicular to the OHWL extending 35 feet inland must be provided. A mowed access path and shoreline are allowed but must not exceed 30% of the landowner's shoreline width or 30 feet, whichever is less.
3. This variance approval is only for a reduced septic setback from the ordinary high water level to 38.3 feet.
4. If approved, this variance shall expire if work does not commence within 12 months of the date of granting the variance.

#### **OPTIONS:**

The Planning Commission may:

- Recommend approval of the variances, citing recommended findings of fact for approval.
- Recommend approval of the variances with conditions citing recommended findings of fact for approval.
- Recommend denial of the variances, citing recommended findings of fact for denial.

#### **RECOMMENDATIONS:**

Staff recommends that the Planning Commission recommend denial of the structure setback and impervious surface variance request since they do not meet all four of the required criteria outlined above, and based upon agency review comments. Staff also recommends that the Planning

Commission recommend approval of the septic setbacks variance request since it does meet all four of the required criteria outlined above.

***“Move to recommend denial of the request from Jeff and Judy Otto for a variance to allow an impervious surface coverage of 21.8% for the property located at 8286 Hidden Bay Court based on the findings listed in the staff report.”***

***“Move to recommend denial of the request from Jeff and Judy Otto for a variance to allow a reduced structure setback of 36.9 feet from the ordinary high water level for the property located at 8286 Hidden Bay Court based on the findings listed in the staff report.”***

***“Move to recommend approval of the request, with conditions listed in the staff report, from Jeff and Judy Otto for a variance to allow a reduced septic system setback of 38.3 feet from the ordinary high water level for the property located at 8286 Hidden Bay Court based on the findings listed in the staff report.”***

**ATTACHMENTS:**

- 1) Location Map
- 2) Land Use Application
- 3) Certificate of Survey
- 4) Written Statement
- 5) Septic Design
- 6) City Engineer Email (6/20/2023)
- 7) Fire Department Email (6/22/2023)
- 8) VBWD Email (6/26/2023)
- 9) DNR Email (6/30/2023)
- 10) Public Comment

Date Received: \_\_\_\_\_  
Received By: \_\_\_\_\_  
Permit #: \_\_\_\_\_



651-747-3900  
3800 Laverne Avenue North  
Lake Elmo, MN 55042

## VARIANCE APPLICATION

Applicant: Jeff and Judy Otto

Address: 8286 Hidden Bay Court North, Lake Elmo, MN 55042

Phone # 612.325.0930

Email Address: baboootto@gmail.com

Fee Owner: Jeff and Judy Otto

Address: 8286 Hidden Bay Court North, Lake Elmo, MN 55042

Phone # 612.325.0930

Email Address: baboootto@gmail.com

Engineer: Architect: PLAAD, LLC.

Address: 1229 TYLER ST NE, MINNEAPOLIS, MN 55413

Phone # 651.336.1393

Email Address: MATT@PLAADOFFICE.COM

Property Location (Address): 8286 Hidden Bay Court North, Lake Elmo, MN 55042

Complete Legal Description: That part of Tract A lying Southerly and Westerly of a line described as beginning at the point of intersection of the Southeasterly line of Tract A and the most Westerly corner of Tract C; thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet; thence North parallel with the East line of Tract A and its extension a distance of 63.29 feet; thence Northwesterly, deflecting to the left 46 degrees 30 minutes a distance of 50 feet; thence Northwesterly, deflecting to the left 4 degrees, to the Westerly line of Tract A;

PID#: 0902921230013

Detailed Reason for Request: Please refer to supplemental documentation.

\*Variance Requests: As outlined in LEC Section 103.00.110 (c), the applicant must demonstrate practical difficulties before a variance can be granted. The practical difficulties related to this application are as follows: Please refer to supplemental documentation.

In signing this application, I hereby acknowledge that I have read and fully understand the applicable provisions of the Zoning ordinance and current administrative procedures. I further acknowledge the fee explanation as outlined in the application procedures and hereby agree to pay all statements received from the City pertaining to additional application expense.

Signature of applicant: Jeff Otto, Judy Otto Date: 6/7/23

Signature of fee owner: Judy Otto, Jeff Otto Date: 6/7/23



**City of Lake Elmo**  
**Escrow Agreement for Municipal Review Services**  
**Deposit Agreement**

**THIS AGREEMENT** is made this 7 day of June, 2023, by the Applicant and Owner (hereinafter individually and collectively referred to as "Applicant") in favor of the City of Lake Elmo, a municipal corporation of Minnesota (hereinafter referred to as "City").

A. "Applicant" whose name and address is:

Jeff and Judy Otto

8286 Hidden Bay Court North

Lake Elmo, MN 55042

B. "Owner" whose name and address is:

Jeff and Judy Otto

8286 Hidden Bay Court North

Lake Elmo, MN 55042

**RECITALS**

**WHEREAS**, the Applicant has applied to the City for approval for one or more of the following: (Select All That Apply)

☐ Plat (Sketch, Preliminary, Final)

☐ PUD/OP-PUD (Pre-Application, Preliminary, Final)

☐ Vacation

☐ Conditional Use Permit

☐ Interim Use Permit

☐ Comprehensive Plan Amendment

☒ Variance

☐ Minor Subdivision

☐ EAW Review

☐ Zoning Text or Map Amendment

☐ Wind Generator

☐ Wireless Communication Permit (co-location)

**WHEREAS**, the Applicant acknowledges the receipt of benefit to the property, from the City's technical and compliance review of the application; and

**WHEREAS**, under authority granted to it, including Minnesota Statutes Chapters 412 and 462, the City will process the application on the condition that the Applicant enter into this Deposit Agreement, which agreement defines certain duties and responsibilities of the Applicant, as well as the City; and the Applicant shall provide cash to the City in the amount satisfactory to the City; and provide security to the City for the payment of all review costs incurred by the City.

**NOW THEREFORE**, the City and Applicant agree as follows:

1. **Requirement.** The Applicant is required to make the necessary deposits prior to the process of municipal planning, public works, legal & engineering review commences.
2. **Review Process.** Applicant acknowledges and agrees that the City shall commence to review and process the review request checked above at such a time that this Agreement is executed by all parties and the cash required for the specific review is deposited and posted by the City's Finance Department. The City may provide a review completion schedule to the Applicant at the time of deposit. The City reserves the right to modify the schedule based on the completeness of the application, the need for additional information for review, or revisions to the application that may occur during the scheduled review.
3. **Use of Deposited Funds.** The City may draw upon the deposits to pay the costs it incurs in connection with reviewing the application. The City shall determine all of its costs, including both administrative and consulting services, at the rates charged by the City or its consultants, determined according to the City's adopted fee schedule. A copy of the current administrative and consulting rates is attached as Exhibit "A", which rates are subject to change by the City, without notice to the Applicant. Exhibit "A" should not be construed as an exhaustive list of consultants and Applicants shall be responsible for all other consulting fees related to the application. The City shall provide Applicant with the applicable rates for consultants used in the review prior to commencement. This Agreement does not pertain to ancillary charges incurred by reviewing of other governmental bodies, including but not limited to, Soil & Water Conservation Districts, Washington County Government, Water Shed, or any other unit of government that may, by right, have review authority.
4. **Conditions of Deposit.** The following stipulations and conditions shall apply to the deposit account for review services contemplated under this Agreement.
  - a. Payment shall be made to City consultants, included but not limited to legal and planning, in the amounts billed to the City, according to consulting rates in effect at the time of the execution of the agreement. Such consulting deemed necessary for the proper review of the application shall be at a usual and customary rate as it relates to the subject matter of the application for payment as determined by the City.
  - b. The City shall reimburse itself from deposit accounts for all costs and expense incurred by the City in connection with the implementation and enforcement of this Agreement. Reimbursement shall occur on a monthly basis and the City's Finance Department shall notify Applicant of the reimbursement via account reconciliation report.
  - c. The City shall not be responsible for paying any interest on the money deposited under the Agreement.
  - d. If in the discretion of both the City's Finance Department and the Community Development Department, there is deemed to be an inadequate balance in the deposit account to pay for all fees and costs incurred by the City, the City will notify the Applicant for the need for an additional deposit. The total of the additional deposit shall be calculated by City staff based on the amount of work yet to be completed in the review of the application. Applicant

agrees to make the additional deposit within (10) days of a receipt of such notice. For purposes hereof, receipt of notice shall be deemed made upon the depositing of the notice in the U.S. Mail, postage paid. In the event, the Applicant fails to make the additional deposit with (10) days of receipt of the notice, the City will terminate its review process and not re-commence until the appropriate deposit is made and posted by the City's Finance Department.

e. No applications will be processed or forwarded to the appropriate governing reviewing body by the City until all amounts due under this Agreement have been paid in full.

5. **Positive Balance in Escrow Accounts.** Upon the happening of any of the following events, the balance in the deposit account less outstanding fees shall be paid to the Applicant within (90) days of receipt by the City of a written request by the Applicant for payment: (1) completion of the development process; or (2) the application is withdrawn by the Application; (3) the applicant is denied by the City for any reason.
6. **Deposit Amounts.** The initial deposit amount contemplated for each the purposes described under the Agreement, which may be revised by the City from time to time, are set forth for Exhibit "B" attached hereto.
7. **Accounting.** If there has been activity in the account, the City will provide a monthly accounting of all expenses charged against the account or when requested by the Applicant. An accounting will also be provided when the City notices the need for an additional escrow deposit.
8. **Terms of Breach.** In the event of any terms of this Agreement are breached by the Applicant, including, but not limited to failure to make additional deposits when required by the City, the City may cease processing any application submitted by the Applicant or order the Applicant to cease any further development or progress under the terms of this Agreement, or both. Applicant indemnifies and holds the City harmless from any liability, claim, action or suit by or any obligation to the Applicant arising from or in connection with the City exercising or enforcing the terms and conditions of this Agreement or action on the Application. The Applicant shall pay all costs and expenses, including reasonable attorney fees and suit costs, incurred by the City arising from or in connection with the City any terms and conditions of this Agreement.
9. **Validity.** If any portion, section, subsection, sentence, clause, paragraph or phrase of this Agreement is for any reason held to be invalid, such invalidity shall not affect the validity of the remaining portion of this Agreement.
10. **Binding Agreement.** The parties mutually recognize and agree that all terms and conditions of this Agreement shall run with the land herein described and shall be binding upon the heirs, successors, administrators and assigns of the parties referenced in this Agreement.
11. **Amendments.** The terms of this Agreement shall not be amended without the written consent of the City and all parties hereto.

[ Signature Page Follows ]



IN WITNESS WHEREOF, we have hereunto set our hands and seals.

APPLICANT

OWNER:

By: Judy Otto  
Its: \_\_\_\_\_

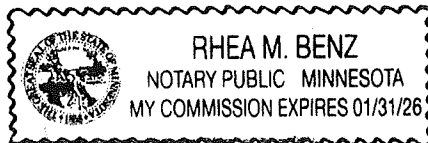
By: Judy Otto  
Its: \_\_\_\_\_

By: Jeffery Otto  
Its: \_\_\_\_\_

By: Jeffery Otto  
Its: \_\_\_\_\_

STATE OF MINNESOTA )  
                    *Ramsey* ss.  
COUNTY OF ~~WASHINGTON~~ )

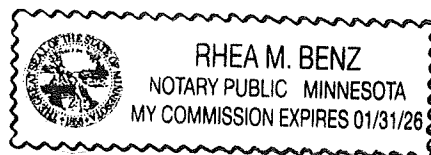
On this 7 day of JUNE, 2023, before me a Notary Public within and for said County, personally appeared JUDY OTTO and JEFFREY OTTO to me personally known, to be the person described in and who executed the foregoing instrument and acknowledged that he / she / they executed that same as his / her / their free act and deed.



*[Signature]*  
Notary Public

STATE OF MINNESOTA )  
                    *Ramsey* ss.  
COUNTY OF ~~WASHINGTON~~ )

On this 7 day of JUNE, 2023, before me a Notary Public within and for said County, personally appeared JUDY OTTO and JEFFREY OTTO to me personally known, to be the person described in and who executed the foregoing instrument and acknowledged that he / she / they executed that same as his / her / their free act and deed.



*[Signature]*  
Notary Public



651-747-3900  
3800 Laverne Avenue North  
Lake Elmo, MN 55042

## ACKNOWLEDGEMENT OF RESPONSIBILITY

This is to certify that I am making application for the described action by the City and that I am responsible for complying with all City requirements with regard to this request. This application should be processed in my name and I am the party whom the City should contact regarding any matter pertaining to this application.

I have read and understand the instructions supplied for processing this application. The documents and/or information I have submitted are true and correct to the best of my knowledge. I will keep myself informed of the deadlines for submission of material and of the progress of this application.

I understand that this application may be reviewed by City staff and consultants. I further understand that additional information, including, but not limited to, traffic analysis and expert testimony may be required for review of this application. I agree to pay to the City upon demand, expenses, determined by the City, that the City incurs in reviewing this application and shall provide an escrow deposit to the City in an amount to be determined by the City. Said expenses shall include, but are not limited to, staff time, engineering, legal expenses and other consultant expenses.

I agree to allow access by City personnel to the property for purposes of review of my application.

Signature of applicant Jeff Otto, Judy Otto Date 6/7/23  
Name of applicant Jeff and Judy Otto Phone 612.325.0930  
(Please Print)

Name and address of Contact (if other than applicant) \_\_\_\_\_

8286 Hidden Bay Court North, Lake Elmo, MN 55042

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



651-747-3900  
3800 Laverne Avenue North  
Lake Elmo, MN 55042

## **AFFIRMATION OF SUFFICIENT INTEREST**

I hereby affirm that I **am the fee title owner** of the below described property or that I have written authorization from the owner to pursue the described action.

Name of applicant Jeff and Judy Otto  
(Please Print)

Street address/legal description of subject property \_\_\_\_\_  
8286 Hidden Bay Court North, Lake Elmo, MN 55042

That part of Tract A lying Southerly and Westerly of a line described as beginning at the point of intersection of the Southeasterly line of Tract A and the most Westerly corner of Tract C; thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet; thence North parallel with the East line of Tract A and its extension a distance of 63.29 feet; thence Northwesterly, deflecting to the left 46 degrees 30 minutes a distance of 50 feet; thence Northwesterly, deflecting to the left 4 degrees, to the Westerly line of Tract A;

Jeff Otto Judy Otto \_\_\_\_\_  
Signature Date 6/7/23

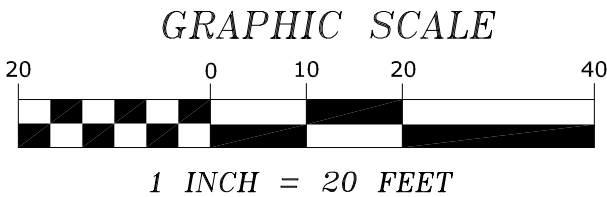
**If you are not the fee owner**, attach another copy of this form which has been completed by the fee owner or a copy of your authorization to pursue this action.

**If a corporation is fee title holder**, attach a copy of the resolution of the Board of Directors authorizing this action.

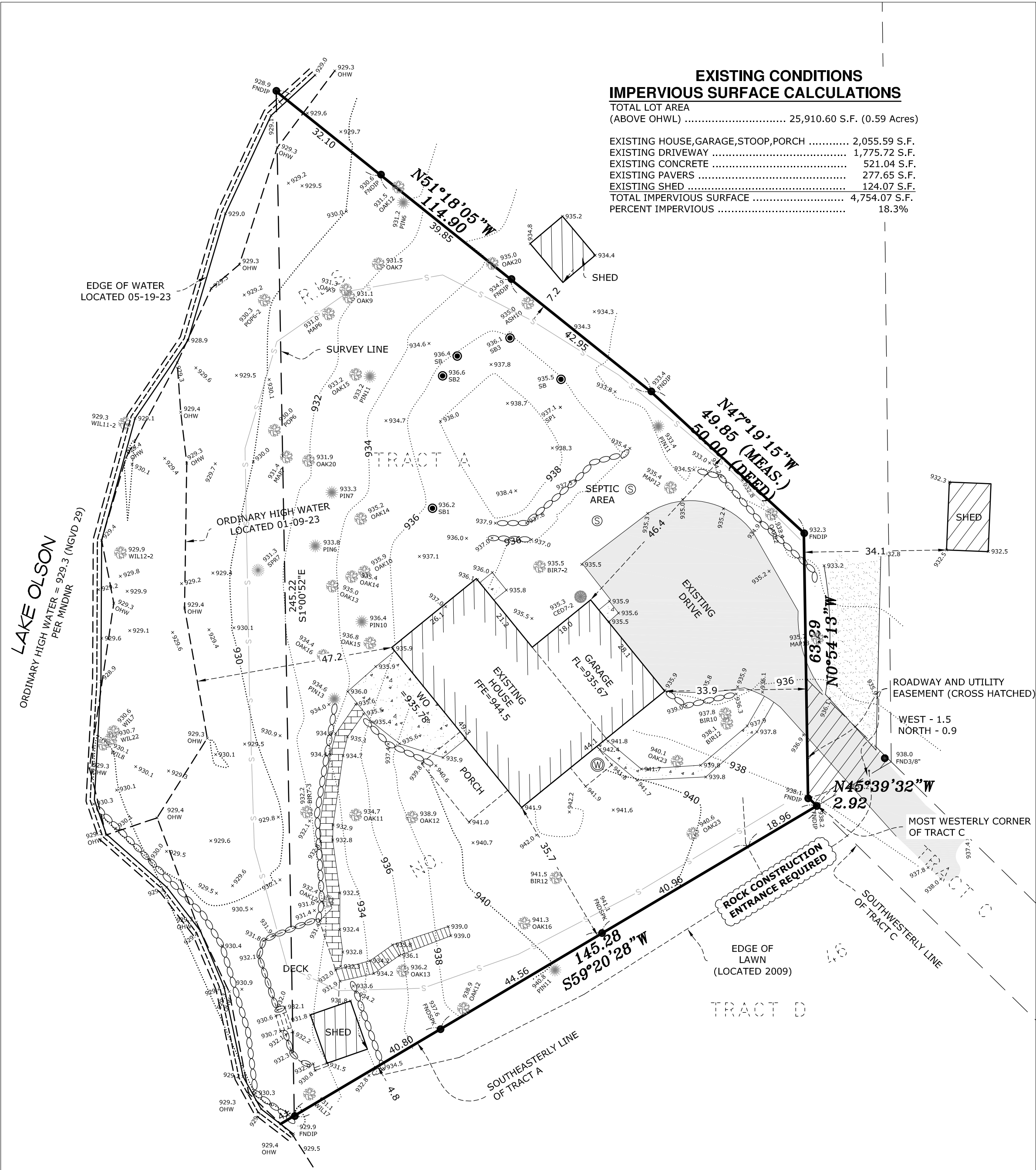
**If a joint venture or partnership is the fee owner**, attach a copy of agreement authorizing this action on behalf of the joint venture or partnership.

CERTIFICATE OF SURVEY

~for~ JUDY OTTO  
~of~ 8286 HIDDEN BAY COURT NORTH  
LAKE ELMO, MN

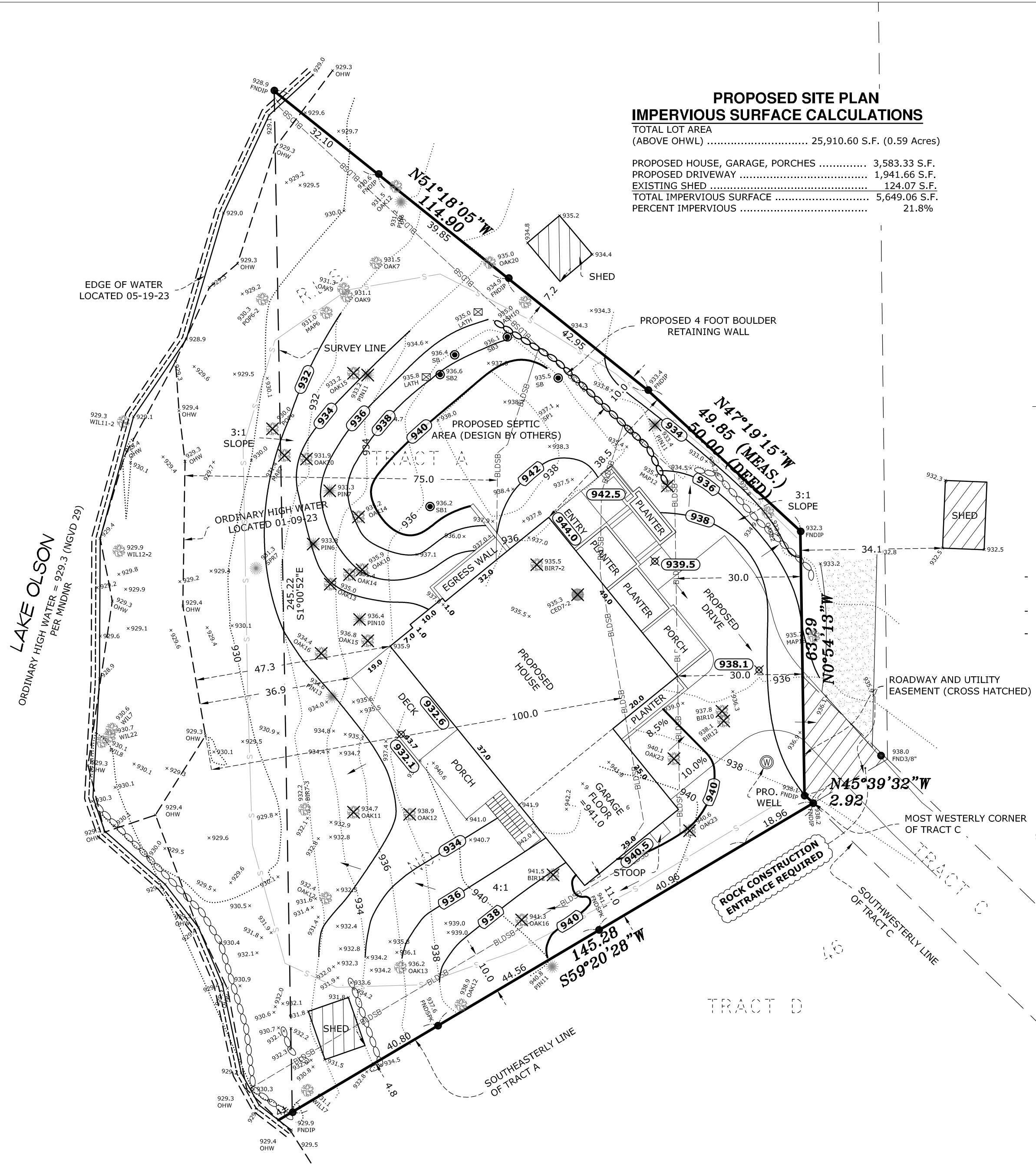


NORTH



**EXISTING CONDITIONS  
IMPERVIOUS SURFACE CALCULATIONS**

TOTAL LOT AREA (ABOVE OHWL)	25,910.60 S.F. (0.59 Acres)
EXISTING HOUSE, GARAGE, STOOP, PORCH	2,055.59 S.F.
EXISTING DRIVEWAY	1,775.72 S.F.
EXISTING CONCRETE	521.04 S.F.
EXISTING PAVERS	277.65 S.F.
EXISTING SHED	124.07 S.F.
TOTAL IMPERVIOUS SURFACE	4,754.07 S.F.
PERCENT IMPERVIOUS	18.3%



**PROPOSED SITE PLAN  
IMPERVIOUS SURFACE CALCULATIONS**

TOTAL LOT AREA (ABOVE OHWL)	25,910.60 S.F. (0.59 Acres)
PROPOSED HOUSE, GARAGE, PORCHES	3,583.33 S.F.
PROPOSED DRIVEWAY	1,941.66 S.F.
EXISTING SHED	124.07 S.F.
TOTAL IMPERVIOUS SURFACE	5,649.06 S.F.
PERCENT IMPERVIOUS	21.8%

- LEGEND**
- DENOTES IRON MONUMENT FOUND
  - DENOTES IRON MONUMENT SET
  - ⊗ 800.0 DENOTES PROPOSED ELEVATION
  - ↖ x 1011.2 DENOTES EXISTING ELEVATION
  - ↖ DENOTES DIRECTION OF DRAINAGE
  - ⊙ DENOTES SANITARY SEWER MANHOLE
  - ⊙ DENOTES SOIL BORING. (BY OTHERS)
  - ⊙ DENOTES WELL
  - DENOTES SILT FENCE
  - DENOTES EXISTING CONTOURS
  - DENOTES PROPOSED CONTOURS
  - DENOTES BUILDING SETBACK LINE
  - DENOTES BITUMINOUS SURFACE
  - DENOTES CONCRETE SURFACE
  - DENOTES PAVER SURFACE

- SURVEY NOTES**
- Field survey was completed by E.G. Rud and Sons, Inc. on 10-26-09, 01-09-23, 05-19-23, and 06-01-23.
  - Bearings shown are on Washington County datum.
  - This survey was prepared without the benefit of title work. Additional easements, restrictions and/or encumbrances may exist other than those shown hereon. Survey subject to revision upon receipt of a current title commitment or an attorney's title opinion.

- TREE DETAIL**
- DENOTES ELEVATION
  - DENOTES TREE QUANTITY
  - DENOTES TREE SIZE IN INCHES
  - DENOTES TREE TYPE
  - ⊗ DENOTES TREE TO BE REMOVED

**BENCHMARK**  
MNDOT BENCHMARK: MICHAEL MN163  
ELEVATION: 919.42 (NGVD 29)

(11 FOOT POURED WALL WALKOUT)  
**PROPOSED ELEVATIONS**  
TOP OF FOUNDATION = 943.56  
GARAGE FLOOR = 941.0  
LOWEST FLOOR = 933.06  
TOP OF FOOTING = 932.56

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

Date: 6/9/2023 License No. 41578

DRAWN BY: RAF	JOB NO: 220858BS	DATE: 01-16-23
CHECK BY: JER	FIELD CREW: DT/CT	
1	06-02-23	ADDED FIELD INFO. RAF
2	06-09-23	ADDED PROPOSED HOUSE RAF
3		
NO.	DATE	DESCRIPTION BY

That part of Tract A lying Southerly and Westerly of a line described as beginning at the point of intersection of the Southeasterly line of Tract A and the most Westerly corner of Tract C; thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet; thence North parallel with the East line of Tract A and its extension a distance of 63.29 feet; thence Northwesterly, deflecting to the left 46 degrees, to the Westerly line of Tract A;

All in REGISTERED LAND SURVEY No. 46, as surveyed and platted and now on file and of record in the office of the Registrar of Titles of said County of Washington, State of Minnesota.

Together with a roadway and utility easement over that part of Tract A described as beginning at the point of intersection of the Southeasterly line of Tract A and the most Westerly corner of Tract C, thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet, thence North parallel with the East line of Tract A and its extension to the intersection with the extension Northwesterly of the Northeastly line of Tract C, thence Southeasterly to the Southeast corner of Tract A, thence Southwesterly along the Southeasterly line of Tract A to the point of beginning; all in REGISTERED LAND SURVEY No. 46, which easement is an appurtenant easement to that part of Tract A described above; also

Together with a roadway and utility easement over Tract C, REGISTERED LAND SURVEY No. 46, which easement is an appurtenant easement to Tracts A, B, and D, REGISTERED LAND SURVEY No. 46; also

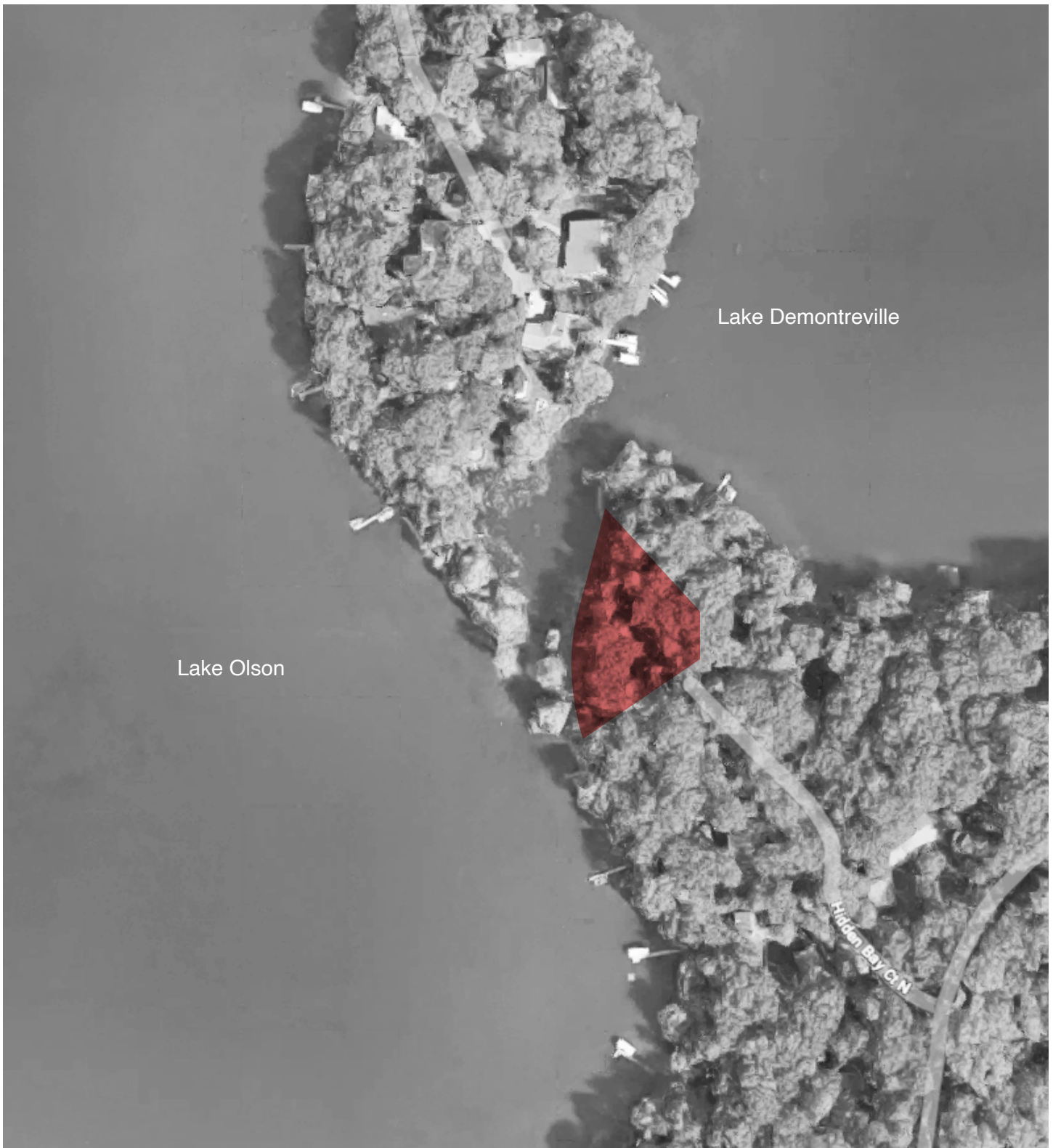
Together with a utility easement over the Southwesterly 10 feet of Lot 12 in OACE ACRES.

**E.G. RUD & SONS, INC.**  
EST. 1977  
Professional Land Surveyors  
6776 Lake Drive NE, Suite 110  
Lino Lakes, MN 55014  
Tel. (651) 361-8200 Fax (651) 361-8701

# Otto Residence

8286 Hidden Bay Court  
Lake Elmo, Minnesota

Variance Application - Written Statements



## TABLE OF CONTENTS

Project Description

Project Team

Project Data

Variance Request Summary

**Figure A** | Proposed Architectural Site Plan

**Figure B** | Proposed New Septic Site Plan and Design

Variance Request Detailed Analysis

**Figure C** | Existing Conditions and Existing Septic

**Figure D** | Existing Conditions and New Septic Design Requirements

Existing Photos and Proposed Renderings

**Figure E** | Existing and Proposed View From Entry Drive

**Figure F** | Existing and Proposed View From Rear Yard

**Figure G** | Existing and Proposed View From Septic Field

Proposed Certificate of Survey

**Figure H** | Proposed Certificate of Survey



## PROJECT DESCRIPTION

June 9, 2023

Dear City of Lake Elmo Planning Department:

Thank you for the opportunity to submit our application to you that includes a series of variance requests for a new proposed home at 8286 Hidden Bay Court in Lake Elmo for Jeff and Judy Otto.

The parcel is located on the narrows separating Lake Demontreville and Olson Lake. A non-conforming home built in 1958 and non-compliant septic system from 1984 are currently on the property. Under LEC 105.04.690(b)(3) the septic system is non-compliant and is required to be updated.

In designing the new home, the architecture team took great care to respect the boundaries of the existing footprint of the home, respect the necessary (and only viable) location of the new septic system (as detailed further below) and to the greatest extent possible mimic natural grade toward the lake. The proposed new home satisfies the required side yard and front yard setbacks.

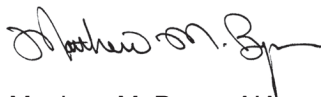
The existing split-level home with a tuck-under garage is quite dated, does not maximize the potential value of the lot and does not serve the owner's desire to age-in-place with single-level primary living spaces.

The owner and design team desired to respect neighboring viewsheds as much as possible. Therefore, instead of building up an additional level on the home (up to the permitted 35' height limitation), the design team instead suggested a slight expansion of the existing footprint, as described within this application. Except for an uncovered deck, the proposed expansion of the new home was directed entirely away from the lake.

Finally, A new soil treatment area is required due to the non-compliant drainfield north of the existing house.

We sincerely thank you for your time and consideration and look forward to answering any additional questions that you may have. You may reach me directly at 651.336.1393 or at [matt@plaadoffice.com](mailto:matt@plaadoffice.com).

Sincerely,



Matthew M. Byers, AIA

## PROJECT TEAM

Owner:	Jeff and Judy Otto 8286 Hidden Bay Court Lake Elmo, Minnesota
Architect:	PLAAD, LLC Matthew Byers, AIA Ryan Andrews, Assoc. AIA 1229 Tyler Street NE, Suite 202 Minneapolis, MN 55413 651.336.1393 matt@plaadoffice.com ryan@plaadoffice.com
Surveyor	E.G. Rud & Sons, Inc. Professional Land Surveyors Jason Rud 6776 Lake Drive NE, Suite 110 Lino Lakes, MN 55014 651.361.8200
Septic Designer	Kloeppner Services and Designs, LLC MPCA License # 4043 763.843.4114 connect@ksd-mn.com

## PROJECT DATA

**Owner:** *Jeff and Judy Otto  
8286 Hidden Bay Court  
Lake Elmo, Minnesota*

## Site Data

**Legal Description:** *That part of Tract A lying Southerly and Westerly of a line described as beginning at the point of intersection of the Southeasterly line of Tract A and the most Westerly corner of Tract C; thence Northwesterly along the extension of the Southwesterly line of Tract C, a distance of 2.92 feet; thence North parallel with the East line of Tract A and its extension a distance of 63.29 feet; thence Northwesterly, deflecting to the left 46 degrees 30 minutes, a distance of 50 feet; thence Northwesterly, deflecting to the left 4 degrees, to the Westerly line of Tract A; all in Registered Land Survey no. 46.*

**Parcel Identification #:** *09.029.21.23.0013*

**Parcel Size (acres):** *0.6 acres*

**Parcel Size (square feet):** *25,910sf  
Above OHWM*

**Existing Use:** *Single family residence*

**Zoning:** *RS - Rural Single Family and Shoreland Managent Overlay District*

**Lake Elmo City Code provisions for which variance is sought:** *LEC 105.12.1260 (c)(3) Table 17-3 (for structure setbacks)  
LEC 105.12.1260 (c)(3) Table 17-3 (for septic setbacks)  
LEC 105.12.1260 (c)(3) Table 17-3 (for lot coverage)*

**Required Structure Setbacks** *Side Yard: 10'  
Rear Yard: 30'  
OHWM: 100'*

**Required setbacks to Sewage Tank and Soil Treatment and Dispersal Area** *75' from OHWM*

## VARIANCE REQUEST SUMMARY

We are applying for a total of three variances.

The variance numbers are indicated with a red circle and number, **x** which correspond to the variance locations on Figures A and B in the following pages.

### **Variance for a reduced setback from the OHWM to the building structure**

**1** The first request is simply a request to rebuild a new home to the extents of the existing home footprint. Because the existing home is non-conforming, rebuilding a new home the same distance from the OHWM requires a variance. In addition, we are requesting for an uncovered deck to encroach further into the existing structure setback and continue across the back face of the home. This deck would extend no further than the existing extents of the existing screen porch, but due to the relationship of the geometry of the existing house to the OHWM, it would decrease the setback from the OHWM to the primary structure, for the deck only.

Therefore, we are requesting a reduced structure setback from the OHWM of 36.9'. This allows the north corner of the new home to come as close to the OHWM as the north corner of the existing home. Again, we are respecting the existing footprint as much as possible. As indicated in **Figure A**, the small, dashed line that overlays the new proposed home shows the extents of the existing home and driveway.

#### **In summary:**

LEC 105.12.1260(c)(3) Table 17-3 requires a setback of 100' from OHWM to building structure.

The setback of the existing home is 47.3' from OHWM to building structure.

We are requesting a setback of 47.3' to the new home and 36.9' to the new uncovered deck from OHWM.

### **Variance for a slightly increased impervious surface coverage**

**2** The second variance request is to allow an increase of our impervious surface coverage from 18.3% to 21.8% primarily to allow for a hammerhead portion of the driveway design. The design team and owner feel this is necessary in order to provide safe egress access to the road adjoining their property. *The existing home already violates the lot coverage maximum of 15%.*

#### **In summary:**

LEC 105.12.1260(c)(3) Table 17-3 stipulates maximum impervious surface of 15% lot area.

Existing impervious surface is 18.3% of lot area.

Proposed impervious surface is 21.8% of lot area.

### **Variance for a reduced setback from the OHWM for the soil treatment area (STA) of the septic system.**

**3** The third variance request is to permit the new designed septic system (SSTS) to encroach to 38.3' from the OHWM. The existing septic system is not compliant and must be updated to meet current standards for site and soil conditions. *The existing septic system already substantially violates the minimum setback requirements from the OHWM and sits in roughly the same location as the proposed new system. Minimum setbacks to primary structure are not met either, mandating the septic system to be reorientated.*

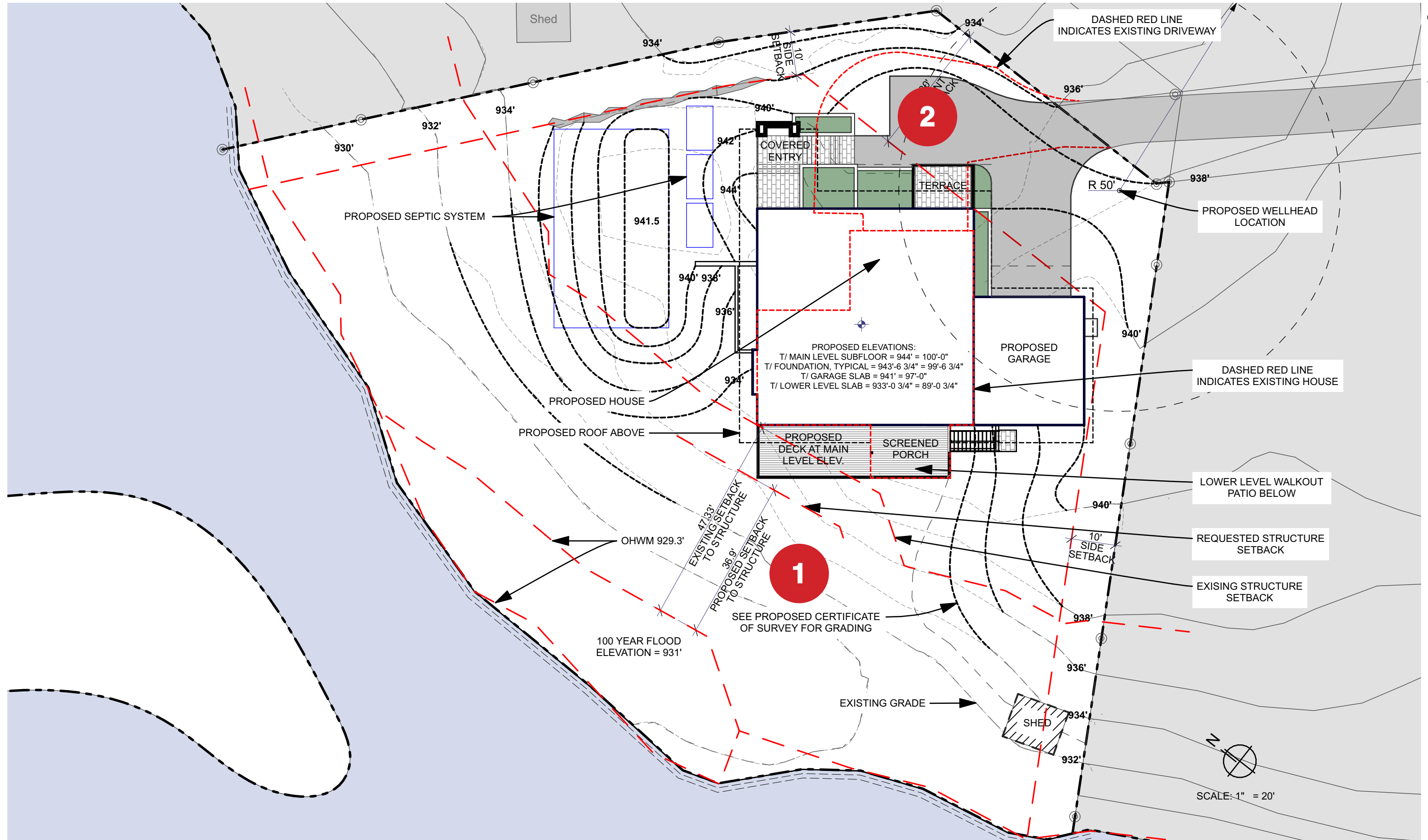
#### **In summary:**

LEC 105.12.1260(c)(3) Table 17-3 requires a setback of 75' from OHWM to STA.

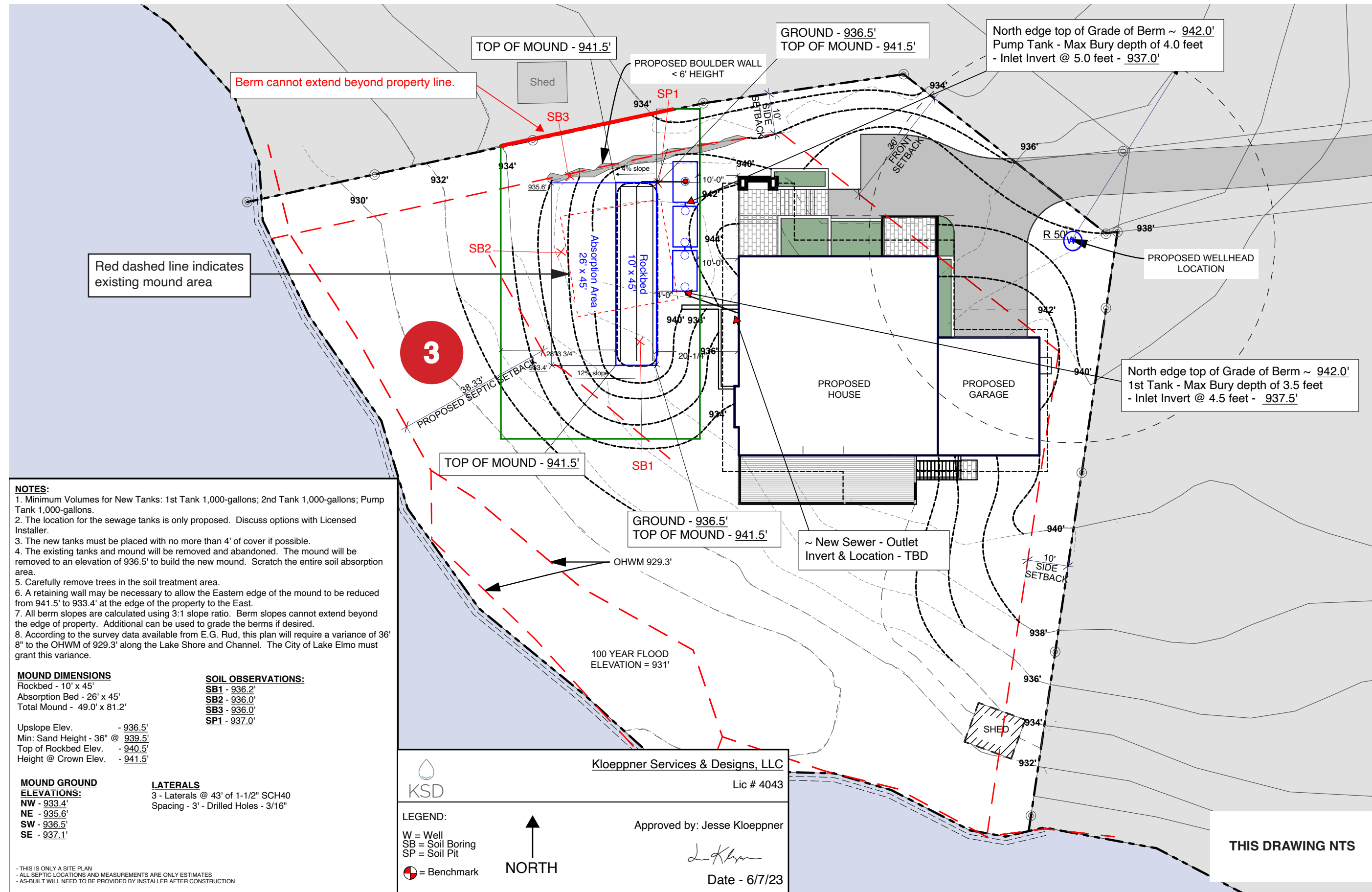
The existing setback is 51.3' from OHWM to STA.

We are requesting a setback of 38.3' from OHWM to STA.

Figure A | Proposed Architectural Site Plan



**Figure B | Proposed New Septic Site Plan and Design**





## VARIANCE REQUEST DETAILED ANALYSIS

In order for action by the board of adjustment to approve or deny a variance request, four findings must be made in accordance with LEC 105.12.320(f). Below, we have detailed our response to each of these required findings for each of the variances sought.

1

### Variance for a reduced setback from the OHWM to the building structure

*LEC 105.12.320(f)(1) Practical difficulties.*

*a) A variance to the provision of this chapter may be granted by the board of adjustment upon the application by the owner of the affected property where the strict enforcement of this chapter would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter.*

*b) Definition of practical difficulties. The term "practical difficulties," as used in connection with the granting of a variance, means that the property owner proposes to use the property in a reasonable manner not permitted by an official control.*

As graphically communicated in **Figure C** on the following page, if the currently mandated setbacks are strictly applied to a new home proposal, the resulting buildable area, shown in the diagram as a hatched red area, provides for an unbuildable site. Given that the owner wishes to construct a modestly sized new home on the property, the strict application of the required structure setbacks alone creates the necessary practical difficulty.

Furthermore, as discussed in more detail under the variance request for the Sewage Tank & Soil Treatment and Dispersal Area, **Figure D** shows the only viable location for the required new Sewage Tank & Soil Treatment and Dispersal Area on the property, as determined by the septic designer engaged on the project.

This adds another level of practical difficulty on top of the structure setbacks, preventing the reasonable use of the property. While a deck facing the lake is a desirable and reasonable feature in lakeshore properties, the location needed for the new septic system precludes locating a deck on the north side of the home. Therefore, the remaining location for the deck is the location proposed on the site plan.

*LEC 105.12.320(f)(2) Unique circumstances.*

*The problem for the landowner/applicant which the proposed variance is intended to correct must be due to circumstances that are unique to the property in question and that were not created by the landowner/applicant.*

Generally, in this locale, the OHWM roughly follows the shoreline to within a few feet. As graphically communicated in **Figure C**, unique to this parcel is an OHWM elevation that encroaches well over 25' into the lot. With an east/west lot depth of 175', this represents a defacto 15% reduction in the lot depth, before any setbacks are applied. The application of the OHWM setback of 100' to any structure represents a total setback from the water's edge of approximately 125', or over 70% of the total lot depth. Add on the required front yard setback of 30', and the required setbacks consume nearly 89% of the lot depth. Again, the resultant buildable area is shown as a red hatched area in **Figure C** and **Figure D**.

Figure C | Existing Conditions and Existing Septic

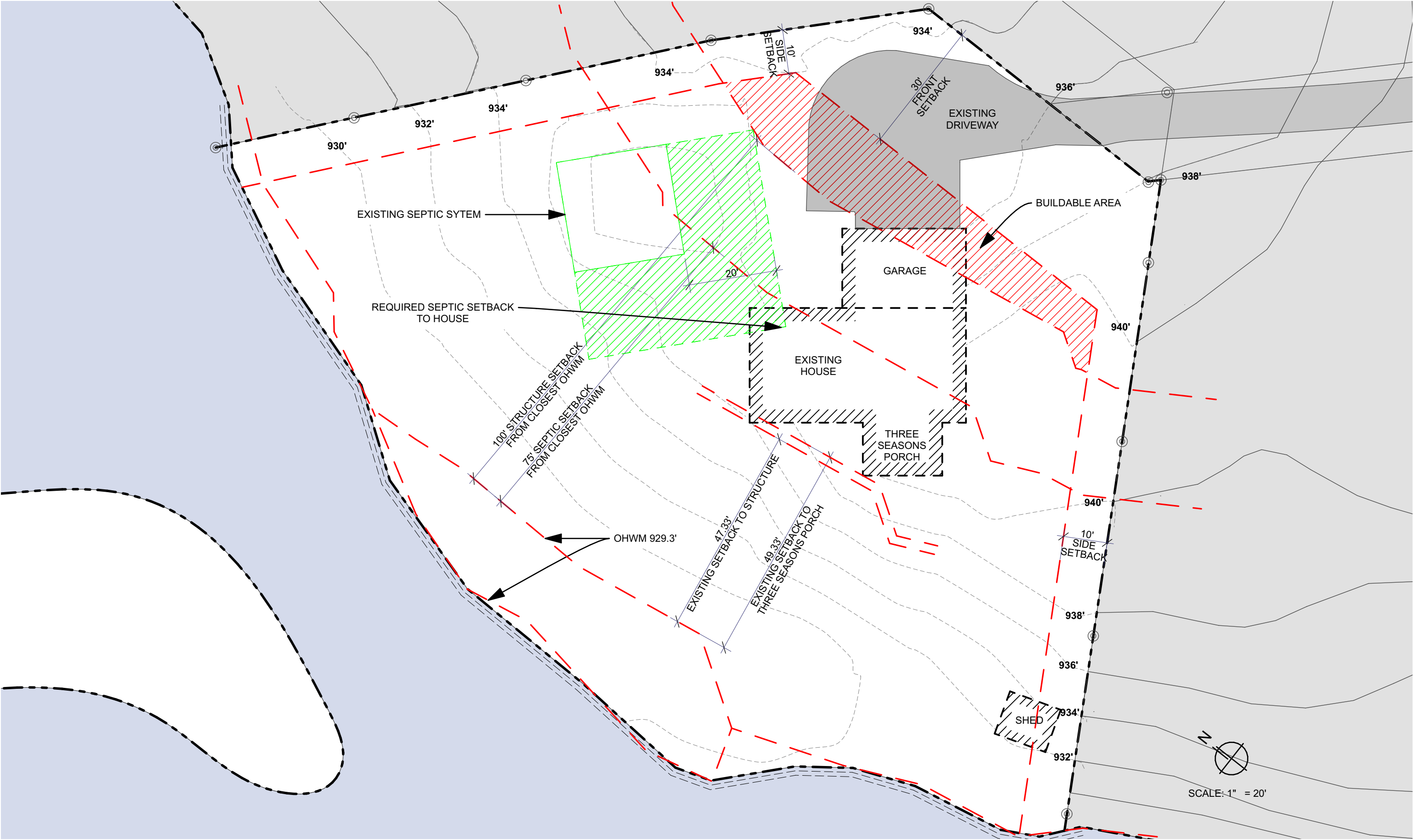
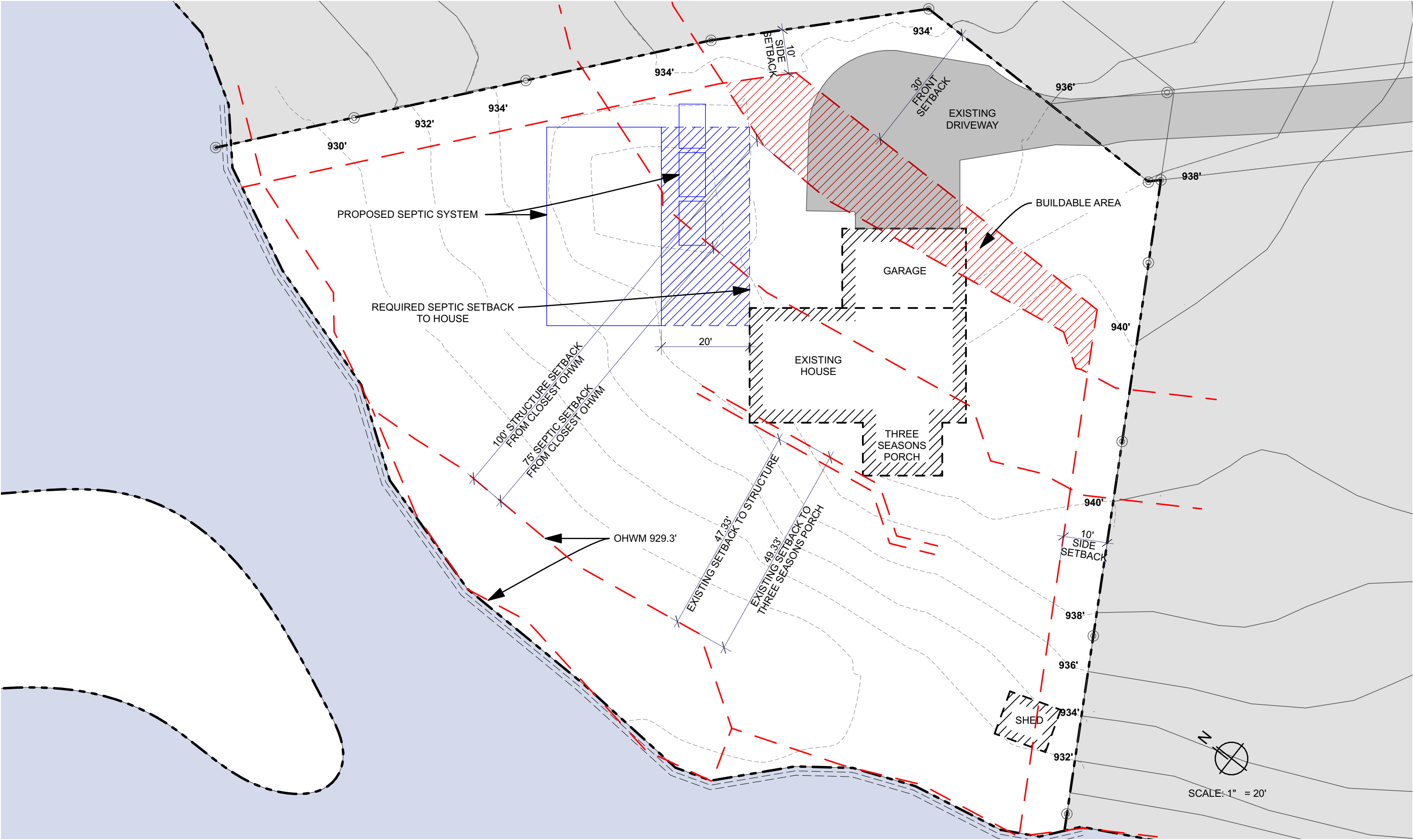


Figure D | Existing Conditions and New Septic Design Requirements



*LEC 105.12.320(f)(3) Character of locality.*

*a) The proposed variance will not alter the essential character of the locality in which the property in question is located.*

*b) Definition of locality. For the purposes of this subsection, the term "locality" shall be defined as all that property within 350 feet of the property proposed for the variance; however, in all events, it shall include all parcels abutting the affected parcel, including those immediately across a public street, alley of other public property.*

Within 350' of the property, there are multiple properties with distances between the OHWM and the house structure of less than 100'. There are even a few properties that come to within 25' of the OHWM.

Given these immediately adjacent and nearby examples of non-conformity, it is reasonable to assume that our request to reduce the setback from the OHWM will not dictate a new precedent nor adversely impact neighboring properties' views and access to the lake, therefore the proposed design is consistent with respect to character of locality,

*LEC 105.12.320(f)(4) Adjacent properties and traffic.*

*The proposed variance will not impair an adequate supply of light and air to property adjacent to the property in question or substantially increase the congestion of the public streets or substantially diminish or impair property values within the neighborhood.*

As noted previously, the desire to expand the footprint on the main level away from the lake permits the design to remain a one level structure from the street side, instead of a more imposing two-story structure. The resulting structure therefore protects the viewsheds and access to light and air of the surrounding properties. Finally, a new home will substantially increase the property values of the neighborhood instead of remaining as an older non-conforming home with a non-compliant septic system.

The home will remain a single-family residence, and therefore, no new anticipated traffic or congestion is projected beyond the existing conditions.

**Variance for a slightly increased impervious surface coverage**

*LEC 105.12.320(f)(1) Practical difficulties.*

2

*a) A variance to the provision of this chapter may be granted by the board of adjustment upon the application by the owner of the affected property where the strict enforcement of this chapter would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter.*

*b) Definition of practical difficulties. The term "practical difficulties," as used in connection with the granting of a variance, means that the property owner proposes to use the property in a reasonable manner not permitted by an official control.*

The current home exists on a lot that is 27,591 square feet in size. Roughly 1,700 sf of that is unusable due to the location of the OHWM encroaching into the lot, resulting in a lot that contains 25,910 sf of area above the OHWM. Per *LEC 105.12.1260 (c)(3) Table 17-3* the minimum lot size for new unsewered riparian lots is 40,000 square feet. Under the same zoning ordinance, the maximum impervious surface for a new build with a 40,000 minimum lot size is 6,000 sf (15% of lot area). This typically allows for the reasonable use of the property, permitting modestly sized homes with the expected garages, driveways, patios, decks, etc. that one would normally expect to be able to build on a lake lot.

At a lot size of 25,910 square feet, *our* lot is 35% smaller than the minimum lot size required for a new unsewered riparian lot on the lake. Imposing the same 15% impervious surface limit on a parcel that is already 35% smaller than required creates a practical difficulty to use the property in a reasonable manner.

*LEC 105.12.320(f)(2) Unique circumstances.*

*The problem for the landowner/applicant which the proposed variance is intended to correct must be due to circumstances that are unique to the property in question and that were not created by the landowner/applicant.*

Due to the required location of the septic design and the desire to age-in-place on the property with a main level garage, the site topography dictates the garage be placed where shown on the new site plan. A hammerhead in the driveway access is needed to allow for safe forward-facing egress from the driveway to the public road. Likewise, the driveway needed to be lengthened in order to provide a safe slope of approach into the garage from the edge of the property line and adjacent property. Again, under the current zoning ordinances, the minimum property size is 40,000 sf. The 15% impervious surface limit would then allow 6,000 sf of impervious surface. This would normally permit these types of site improvements to occur without a variance needed. However, given that this lot is 35% smaller than the minimum lot size required by the ordinance, this property imposes unique constraints upon the project.

*LEC 105.12.320(f)(3) Character of locality.*

*a) The proposed variance will not alter the essential character of the locality in which the property in question is located.*

*b) Definition of locality. For the purposes of this subsection, the term "locality" shall be defined as all that property within 350 feet of the property proposed for the variance; however, in all events, it shall include all parcels abutting the affected parcel, including those immediately across a public street, alley of other public property.*

The lot under consideration is 30% smaller than average size of the closest 18 adjacent lots on Hidden Bay Trail North, most of which have impervious surface coverage well in excess of the required 15% limit - some egregiously so. Most properties on Hill Trail North (just across the channel) are also *well in excess* of the 15% limit. In a desire to limit the height of the home and respect neighboring views and avoid a three-story home from the lakeside, a second level was omitted, necessitating the need for additional main level impervious surface. While we acknowledge that the new site plan does exceed the allowable impervious surface coverage percentage, we argue that the resulting structure is far more respectful of the neighboring properties' views and the visual impact on the lake than a three level home. Therefore, we argue that the essential character of the locality is maintained, if not improved.

*LEC 105.12.320(f)(4) Adjacent properties and traffic.*

*The proposed variance will not impair an adequate supply of light and air to property adjacent to the property in question or substantially increase the congestion of the public streets or substantially diminish or impair property*



values within the neighborhood.

Again, while we acknowledge that the new site plan does exceed the allowable impervious surface coverage percentage, we argue that the resulting structure is far more respectful of the neighboring properties' views and the visual impact on the lake than a three level home. Therefore, we argue that the essential character of the locality is maintained, if not improved. We are replacing a single-family residence with a new single-family residence. There is no expected increase in congestion to the public streets.

### **3 Variance for a reduced setback from the OHWM to the Sewage Tank & Soil Treatment and Dispersal Area**

*LEC 105.12.320(f)(1) Practical difficulties.*

*a) A variance to the provision of this chapter may be granted by the board of adjustment upon the application by the owner of the affected property where the strict enforcement of this chapter would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter.*

*b) Definition of practical difficulties. The term "practical difficulties," as used in connection with the granting of a variance, means that the property owner proposes to use the property in a reasonable manner not permitted by an official control.*

The only location for a new soil treatment area (STA) for a 3-bedroom house on this lot is in the location designed by Kloeppner Services & Design, LLC. The setback from the well, the house, the property boundaries, the Ordinary High-Water Level along Lake Olson and connecting waterway, and disturbed areas create a practical difficulty for the proposed STA and no reasonable alternate soil treatment area can be built for this lot. The proposed location is generally shown in **Figure D** and more precisely articulated in **Figure B**.

*LEC 105.12.320(f)(2) Unique circumstances.*

*The problem for the landowner/applicant which the proposed variance is intended to correct must be due to circumstances that are unique to the property in question and that were not created by the landowner/applicant.*

The setback from the well, the house, the property boundaries, the Ordinary High-Water Level along Olson Lake and connecting waterway, and disturbed areas create a unique circumstance for the proposed STA and no reasonable alternate soil treatment area can be built for this lot.

*LEC 105.12.320(f)(3) Character of locality.*

*a) The proposed variance will not alter the essential character of the locality in which the property in question is located.*

*b) Definition of locality. For the purposes of this subsection, the term "locality" shall be defined as all that property within 350 feet of the property proposed for the variance; however, in all events, it shall include all parcels abutting the affected parcel, including those immediately across a public street, alley of other public property.*

Provided that the new sewage tank & soil treatment and dispersal area is substantially in the same location as the existing non-compliant system, there are no impacts to character of locality.

*LEC 105.12.320(f)(4) Adjacent properties and traffic.*

*The proposed variance will not impair an adequate supply of light and air to property adjacent to the property in question or substantially increase the congestion of the public streets or substantially diminish or impair property values within the neighborhood.*

Provided that the new sewage tank & soil treatment and dispersal area is substantially in the same location as the existing non-compliant system, no new impacts to adjacent properties and traffic are expected.



## EXISTING PHOTOS AND PROPOSED RENDERINGS



*Existing view to the northwest from entry drive*



*Proposed view to the northwest from entry drive*





*Existing view to the southeast from rear yard*



*Proposed view to the southeast from rear yard*





*Existing view to the southwest from septic field*

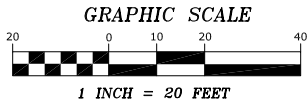


*Proposed view to the southwest from septic field*

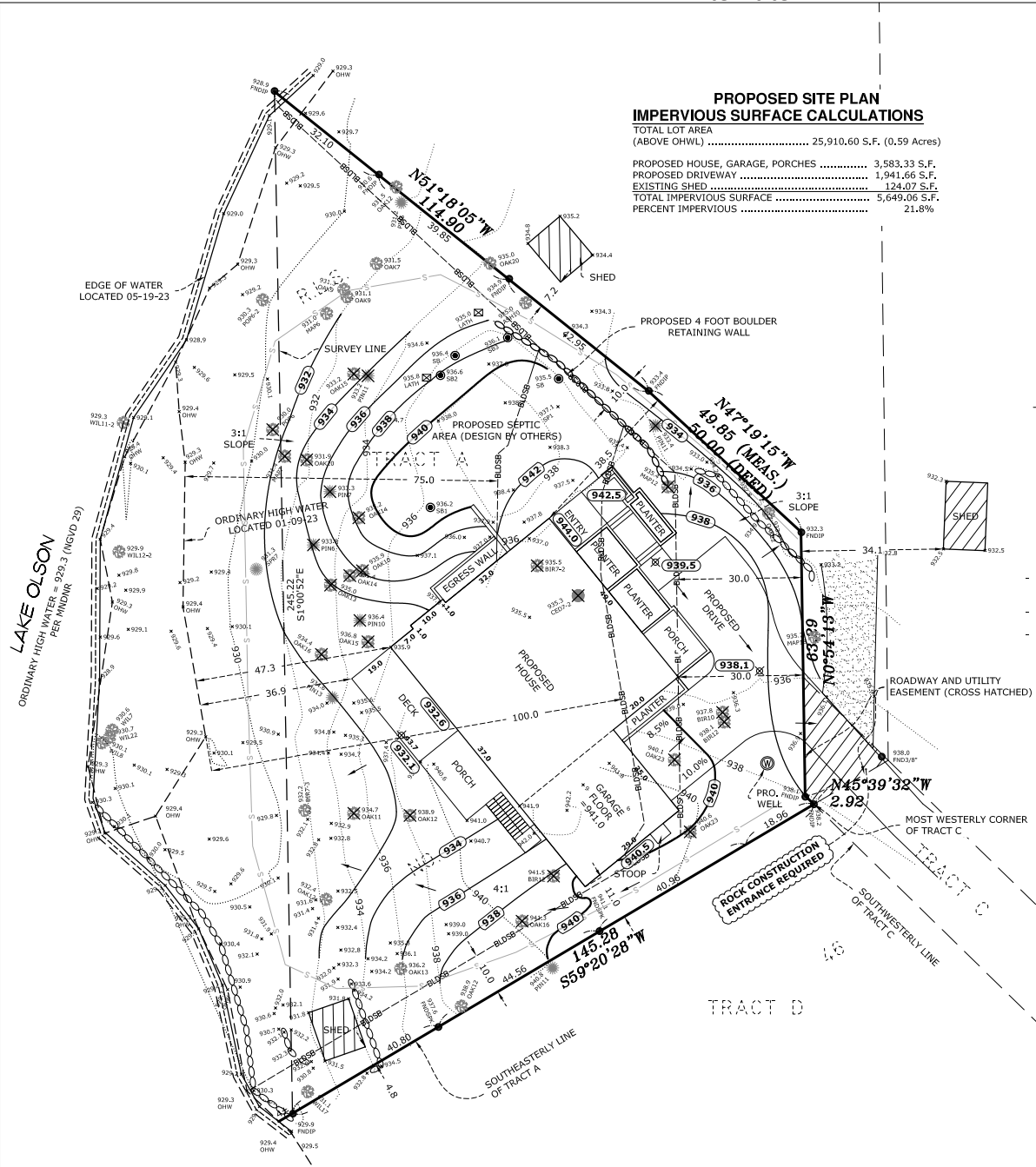
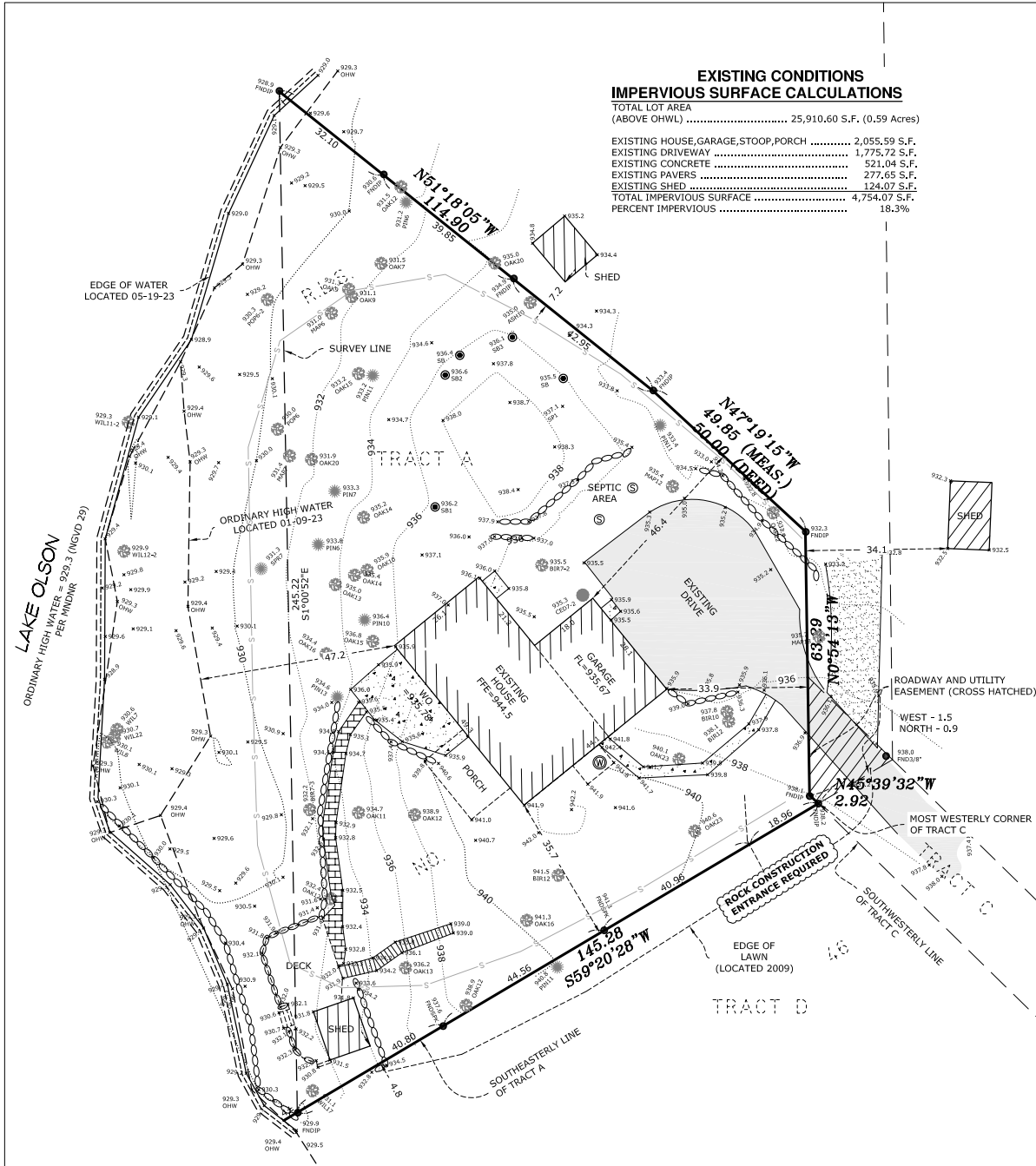
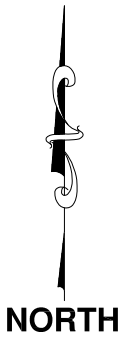


# CERTIFICATE OF SURVEY

~for~ JUDY OTTO  
~of~ 8286 HIDDEN BAY COURT NORTH  
LAKE ELMO, MN



this version is NTS to scale  
to fit to 11x17.



## LEGAL DESCRIPTION

That part of Tract A lying Southerly and Westerly of a line described as beginning at the point of intersection of the Southeastery line of Tract A and the most Westerly corner of Tract C; thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet; thence North parallel with the East line of Tract A and its extension a distance of 63.29 feet; thence Northwesterly, deflecting to the left 46 degrees, to the Westerly line of Tract A;

All in REGISTERED LAND SURVEY No. 46, as surveyed and platted and now on file and of record in the office of the Registrar of Titles of said County of Washington, State of Minnesota.

Together with a roadway and utility easement over that part of Tract A described as beginning at the point of intersection of the Southeastery line of Tract A and the most Westerly corner of Tract C, thence Northwesterly along the extension of the Southwesterly line of Tract C a distance of 2.92 feet, thence North parallel with the East line of Tract A and its extension to the intersection with the extension Northwesterly of the Northeastery line of Tract C, thence Southeastery to the Southeast corner of Tract A, thence Southwesterly along the Southeastery line of Tract A to the point of beginning; all in REGISTERED LAND SURVEY No. 46, which easement is an appurtenant easement to that part of Tract A described above; also

Together with a roadway and utility easement over Tract C, REGISTERED LAND SURVEY No. 46, which easement is an appurtenant easement to Tracts A, B, and D, REGISTERED LAND SURVEY No. 46; also

Together with a utility easement over the Southwesterly 10 feet of Lot 12 in OACE ACRES.

**E. G. RUD & SONS, INC.**  
EST. 1977  
Professional Land Surveyors  
6776 Lake Drive NE, Suite 110  
Lino Lakes, MN 55014  
Tel. (651) 361-8200 Fax (651) 361-8701

S:\RUD\CAD\22PROJ\220858BS\220858BS-2.DWG

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

JASON E. RUD

Date: 6/9/2023 License No. 41578

DRAWN BY:	RAF	JOB NO:	220858BS	DATE:	01-16-23
CHECK BY:	JER	FIELD CREW:	DT/CT		
1	06-02-23	ADDED FIELD INFO.	RAF		
2	06-09-23	ADDED PROPOSED HOUSE	RAF		
3					
NO.	DATE	DESCRIPTION	BY		

220858BS

PLAAD, LLC | 1229 Tyler Street NE, Suite 202, Minneapolis, MN 55413 | www.plaadoffice.com



6/7/2023



# SSTS Design

8286 Hidden Bay Court North  
Lake Elmo, MN 55042

PID # 09.029.21.23.0013

Version 1.2

**Kloepfner Services & Designs, LLC**

MPCA LICENSE # 4043

763.843.4114

CONNECT@KSD-MN.COM

# SSTS Design Summary Report

6/7/23

On May 23<sup>rd</sup>, 2023, a site evaluation was conducted at 8286 Hidden Bay Court North, Lake Elmo, MN 55042 to identify a location for a replacement Subsurface Sewage Treatment System (SSTS) for a new 3-bedroom home. The PID number is 09.029.21.23.0013.

*Prior to submitting for permit from Washington County, please review and sign all pages which require a signature.*

## Wastewater Sources & Peak Flow Rate

The expected waste strength is Residential Wastewater with a Peak flow of 450 gallons per day (GPD) for a 3-bedroom house. The Actual Daily Flow should be less than 70% of the Peak Flow (315 GPD).

## Type III - Mound

The dispersal area will be a Type III Mound. The Mound Soil Absorption Area required 1,117-sqft (26' x 45'). The site was evaluated for a Type I system with or without the need for a variance. Due to the location of the house, a new well, and existing soil, no suitable area is available for a Type I system with soil with > 12" to a limiting condition or slope < 12%.

*The minimum required materials for the sewer line, distribution network, pumps, supply line, sand, rock, fill and cover are detailed in the design worksheets included with this design. Actual values may change slightly and will need to be field verified for correctness.*

## Design Notes

1. Minimum Volumes for New Tanks: 1st Tank 1,000-gallons; 2nd Tank 1,000-gallons; Pump Tank 1,000-gallons.
2. The location for the sewage tanks is only proposed. Discuss options with Licensed Installer.
3. The new tanks must be placed with no more than 4' of cover if possible.
4. The existing tanks and mound will be removed and abandoned. The mound will be removed to an elevation of 936.5' to build the new mound. Scratch the entire soil absorption area.
5. Carefully remove trees in the soil treatment area.
6. A retaining wall may be necessary to allow the Eastern edge of the mound to be reduced from 941.5' to 933.4' at the edge of the property to the East.
7. All berm slopes are calculated using 3:1 slope ratio. Berm slopes cannot extend beyond the edge of property. Additional can be used to grade the berms if desired.
8. According to the survey data available from E.G. Rud, this plan will require a variance of 36' 8" to the OHWM of 929.3' along the Lake Shore and Channel. The City of Lake Elmo must grant this variance.

## Construction Notes

### Building Permit requirements

No construction shall be allowed by any local unit of government until the permit required for the subsurface sewage treatment system has been issued.

### Site Protection

Prior to and during construction or lot improvements, the proposed initial and replacement soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

### MR 7080.2100, Subpart 1. F

Electrical installations must comply with applicable laws and ordinances including the most current codes, rules, and regulations of public authorities having jurisdiction and with part 1315.0200, which incorporates the National Electrical Code.

### As-Built Drawing

The Licensed Installer must provide an As-Built of the final location of all components. The attached Site Plan is only for reference and should not be considered as final survey or location of system components.

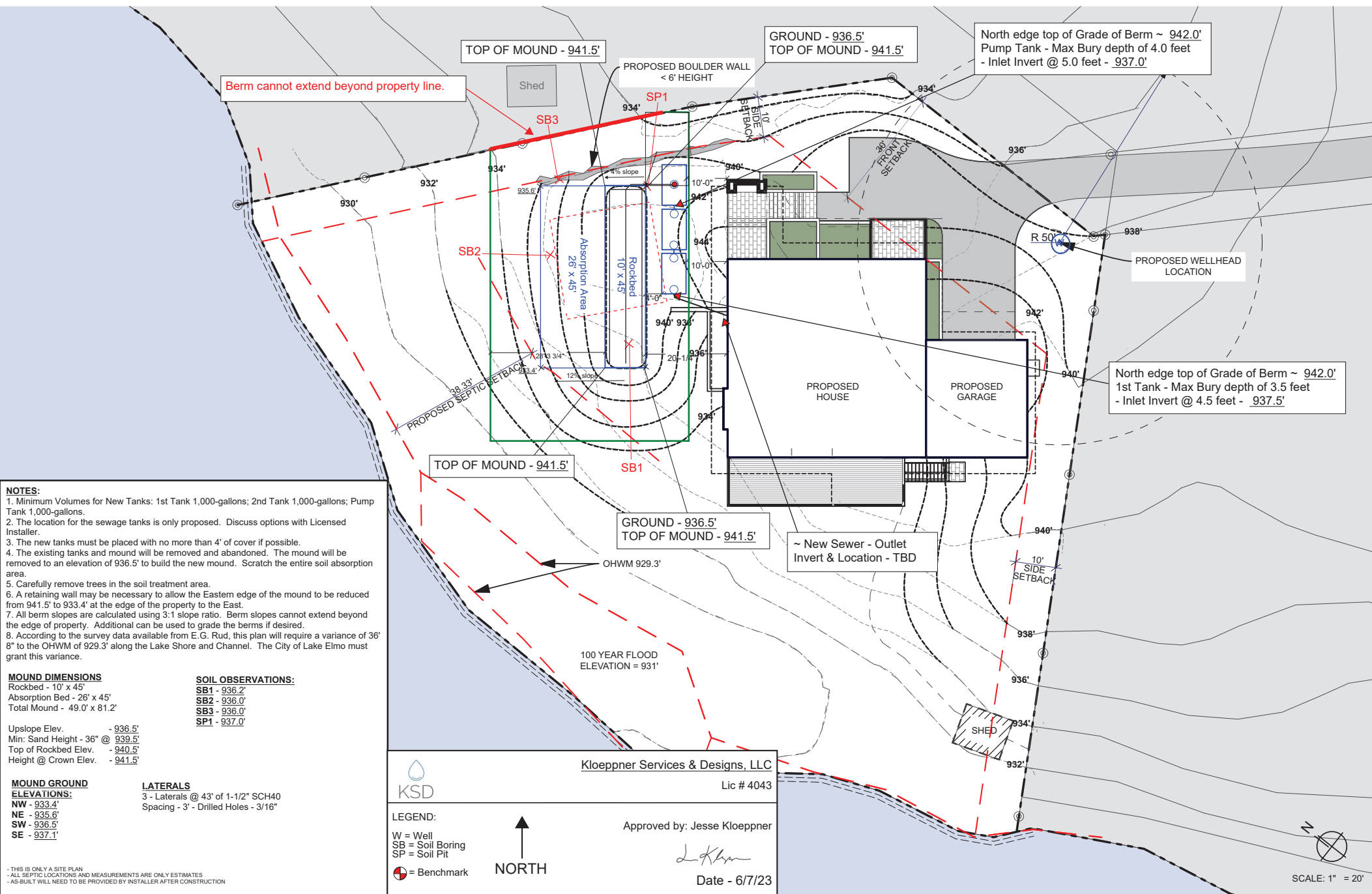
### Protection from Freezing for Supply Line

The Mound supply line must drain back and empty pipe after each dose. To avoid potential freezing, additional depth or insulation may be necessary to keep line from freezing if buried too shallow.

Soil Erosion & Protection from Freezing

The dispersal area must have seed and grass established throughout the excavated areas to maintain proper protection from soil erosion and freezing.





SCALE: 1" = 20'





NEW MOUND - 26' X 45'

TANKS





NEW MOUND - 26' X 45'

TANKS



SOUTHEAST CORNER OF STA

TANYS-9350



SOUTHEAST CORNER OF STA

ANGLE POINT - 100'





MOUND UPSLOPE - 9365

SOUTHWEST CORNER OF STA



NORTHWEST CORNER OF STA





NORTHEAST CORNER OF STA

MOULD STA - 935.6'



# Preliminary Evaluation Worksheet

## 1. Contact Information

v 03.15.2023

Property Owner/Client: Otto

Date Completed: 4/25/2023

Site Address: 8286 Hidden Bay Ct N, Lake Elmo, MN 55402

Project ID:

Legal Description:

LOT A SUBDIVISIONCD 37672 SUBDIVISIONNAME RLS #46 THAT PART OF TRACT A LYING SOUTHERLY AND WESTERLY OF A LINE DESCRIBED AS BEGINNING AT THE POINT OF INTERSECTION OF THE SOUTHEASTERLY LINE OF TRACT A AND THE MOST WESTERLY CORNER OF TRACT C; THENCE NORTHWESTERLY ALONG THE EXTENSION OF THE SOUTHWESTERLY LINE OF TRACT C, A DISTANCE OF 2.92 FEET; THENCE NORTH PARALLEL WITH THE EAST LINE OF TRACT A AND ITS EXTENSION A DISTANCE OF 63.29 FEET; THENCE NORTHWESTERLY, DEFLECTING TO THE LEFT 46 DEGREES 30 MINUTES, A DISTANCE OF 50 FEET; THENCE NORTHWESTERLY, DEFLECTING TO THE LEFT 4 DEGREES, TO THE WESTERLY LINE OF TRACT A; ALL IN REGISTERED LAND SURVEY NO. 46.

Parcel ID: 09.029.21.23.0013

SEC: 09

TWP: 29

RNG: 21

## 2. Flow and General System Information

### A. Client-Provided Information

Project Type: ☐ New Construction ☒ Replacement ☐ Expansion ☐ Repair

Project Use: ☒ Residential ☐ Other Establishment:

Residential use: # Bedrooms: 3

Dwelling sq.ft.:

Unfinished sq.ft.:

# Adults:

# Children:

# Teenagers:

In-home business (Y/N): No

If yes, describe:

Water-using devices: (check all that apply)

<input type="checkbox"/> Garbage Disposal/Grinder	<input checked="" type="checkbox"/> Dishwasher	<input type="checkbox"/> Hot Tub*
<input type="checkbox"/> Sewage pump in basement	<input type="checkbox"/> Water Softener*	<input type="checkbox"/> Sump Pump*
<input type="checkbox"/> Large Bathtub >40 gallons	<input type="checkbox"/> Iron Filter*	<input type="checkbox"/> Self-Cleaning Humidifier*
<input checked="" type="checkbox"/> Clothes Washing Machine	<input type="checkbox"/> High Eff. Furnace*	<input type="checkbox"/> Other:

\* Clear water source - should not go into system

Additional current or future uses:

Anticipated non-domestic waste:

The above is complete & accurate:

Client signature & date

### B. Designer-determined Flow and Anticipated Waste Strength Information

Attach additional information as necessary.

Design Flow: 450 GPD

Anticipated Waste Type: Residential

Maximum Concentration BOD: 170 mg/L TSS: 60 mg/L Oil & Grease: 25 mg/L

## 3. Preliminary Site Information

### A. Water Supply Wells

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	8286 Hidden Bay Ct N	??	>50	>50		50	New Well
2							
3							
4							

Additional Well Information: All SSTs components must be >50' from non-sensitive wells.

## Preliminary Evaluation Worksheet

Site within 200' of noncommunity transient well (Y/N)	No	Yes, source:	
Site within a drinking water supply management area (Y/N)	No	Yes, source:	
Site in Well Head Protection inner wellhead management zone (Y/N)	No	Yes, source:	
Buried water supply pipes within 50 ft of proposed system (Y/N)	No		
<b>B. Site located in a shoreland district/area?</b>	Yes	Yes, name:	Lake Olson
Elevation of ordinary high water level:	929	ft	Source: <span style="border: 1px solid black;">County GIS</span>
Classification: <span style="border: 1px solid black; padding: 2px;">Lake- Recreational</span>	Tank Setback: <span style="border: 1px solid black; text-align: center;">75</span>	ft.	STA Setback: <span style="border: 1px solid black; text-align: center;">75</span> ft.
<b>C. Site located in a floodplain?</b>	No	Yes, Type(s):	N/A
Floodplain designation/elevation (10 Year):	N/A	ft	Source: <span style="border: 1px solid black;">N/A</span>
Floodplain designation/elevation (100 Year):	N/A	ft	Source: <span style="border: 1px solid black;">N/A</span>
<b>D. Property Line Id / Source:</b>	<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> County GIS <input type="checkbox"/> Plat Map <input type="checkbox"/> Other: <span style="border: 1px solid black;"></span>		
<b>E. ID distance of relevant setbacks on map:</b>	<input checked="" type="checkbox"/> Water <input checked="" type="checkbox"/> Easements <input checked="" type="checkbox"/> Well(s) <input checked="" type="checkbox"/> Building(s) <input checked="" type="checkbox"/> Property Lines <input checked="" type="checkbox"/> OHWL <input type="checkbox"/> Other: <span style="border: 1px solid black;"></span>		

#### 4. Preliminary Soil Profile Information From Web Soil Survey (attach map & description)

	Map Units: <span style="border: 1px solid black; padding: 2px;">1033; Udifluvents</span>	Slope Range: <span style="border: 1px solid black;"></span> %
	List landforms: <span style="border: 1px solid black; padding: 2px;">Shorelines</span>	
	Landform position(s): <span style="border: 1px solid black; padding: 2px;">Plain</span>	
	Parent materials: <span style="border: 1px solid black; padding: 2px;">Lacustrine</span>	
	Depth to Bedrock/Restrictive Feature: <span style="border: 1px solid black; text-align: center;">&gt;80</span> in	Depth to Watertable: <span style="border: 1px solid black; text-align: center;">&gt;80</span> in
Map Unit Ratings	Septic Tank Absorption Field- At-grade: <span style="border: 1px solid black; padding: 2px;">Not rated</span>	
	Septic Tank Absorption Field- Mound: <span style="border: 1px solid black; padding: 2px;">Not rated</span>	
	Septic Tank Absorption Field- Trench: <span style="border: 1px solid black; padding: 2px;">Not rated</span>	

#### 5. Local Government Unit Information

Name of LGU:	Washington County
LGU Contact:	Public Health & Environment - 651-430-6655
LGU-specific setbacks:	75' from Recreational Lake
LGU-specific design requirements:	Sewage Tanks: 3-bedroom = 1,000-gal & 1,000-gal
LGU-specific installation requirements:	
Notes:	

## Proposed Design Map

Project ID:

Property Address: 8286 Hidden Bay Ct N, Lake Elmo, MN 55402

Date Completed: 6/1/2023

<b>Elevations in feet</b>		Benchmark:	935.8	ft	BM Location -	Top of Existing Pump Tank Manhole Cover	
<b>System Corners:</b>		<b>Soil Observation:</b>					<b>Bury Depth</b>
NW:	933.4	ft	SB1:	936.2	ft	Existing Tanks - Inlet Invert	932.8
NE:	935.6	ft	SB2:	936.0	ft	New Tanks	
SW:	936.5	ft	SB3:	936.0	ft	1st Tank - Ground	
SE:	937.1	ft	SP1:	936.0	ft	- Inlet Invert	
Rockbed		ft				2nd Tank - Ground	
Rockbed		ft				- Inlet Invert	
						Pump Tank - Ground	
						- Inlet Invert	
						Pump Intake	

### Mapping Checklist

#### Locate

- ☐ Lot Dimensions/Property Lines
- ☐ Dwellings and Other Improvements
- ☐ Existing or Proposed System(s)
- ☐ Replacement Area
- ☐ Unsuitable Area(s)
- ☐ Public Water Supply Wells
- ☐ Pumping Access
- ☐ Inner Wellhead Zone
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

#### Easements

- ☒ Phone
- ☒ Electric
- ☐ Gas
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

#### Elevations

- ☐ Benchmark
- ☐ Borings
- ☐ Perc Tests
- ☐ Horizontal and Vertical Reference Points

#### Setbacks

- ☒ Building
- ☐ All water wells within 100 feet
- ☐ Pressure Pipe
- ☐ Water Suction
- ☐ Streams, Lakes
- ☐ Floodway and Fringe
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

Comments:

Elevation Difference: Pump Intake (BURY DEPTH OF 4 FEET FROM 942.0') 933.5' to 940.0' = 6.5'

# Field Evaluation Worksheet

## 1. Project Information

v 03.15.2023

Property Owner/Client:  Project ID:

Site Address:  Date Completed:

## 2. Utility and Structure Information

Utility Locations Identified ☒ Gopher State One Call #  ☐ Any Private Utilities:

Locate and Verify (*see Site Evaluation map*) ☒ Existing Buildings ☒ Improvements ☒ Easements ☒ Setbacks

## 3. Site Information

Vegetation type(s):  Landscape position:

Percent slope:  % Slope shape:  Slope direction:

Describe the flooding or run-on potential of site:

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N):  If yes, describe:

## 4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N):

If yes, describe:

Soil observations were conducted in the proposed system location (Y/N):

A soil observation in the most limiting area of the proposed system (Y/N):

Number of soil observations:  Soil observation logs attached (Y/N):

Percolation tests performed & attached (Y/N):

## 5. Phase I. Reporting Information

	Depth	Elevation	
Limiting Condition*:	<input type="text" value="0"/> in	<input type="text" value="936.5"/> ft	<i>*Most Restrictive Depth Identified from List Below</i>
Periodically saturated soil:	<input type="text" value="0"/> in	<input type="text" value="936.5"/> ft	
Standing water:	<input type="text"/> in	<input type="text"/> ft	
Bedrock:	<input type="text"/> in	<input type="text"/> ft	
Benchmark Elevation:	<input type="text" value="935.8"/> ft	Elevations and Benchmark on map? (Y/N): <input type="text" value="Yes"/>	

Benchmark Elevation Location:

Differences between soil survey and field evaluation:

Site evaluation issues / comments:

Anticipated construction issues:



# Soil Observation Log


Project ID:

v 03.15.2023

Client: <u>Otto</u>				Location / Address: <u>8286 Hidden Bay Ct N, Lake Elmo, MN 55402</u>							
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input checked="" type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter <input type="checkbox"/> Disturbed/Fill											
Landscape Position: <u>Shoulder</u>				Slope %: <u>12.0</u>		Slope shape: <u>Convex, Convex</u>			Flooding/Run-On potential: <u>No</u>		
Vegetation: <u>Lawn</u>			Soil survey map units: <u>1033; Udifluvents</u>				Surface Elevation-Relative to benchmark: <u>936.2</u>				
Date/Time of Day/Weather Conditions: <u>5/23/2023</u>			<u>1:20 PM</u>		<u>Sunny</u>			Limiting Layer Elevation: <u>935.2</u>			
Observation #/Location: <u>SB1</u>		<u>Southwest end of Mound Upslope</u>				Observation Type: <u>Auger</u>					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I				
							Shape	Grade	Consistence		
0-6	Fine Sandy Loam	5	10YR 3/2	None		None	None	Granular	Weak	Friable	
6-10	Silt Loam	5	10YR 3/4	None		None	None	Granular	Moderate	Friable	
10-13	Clay Loam	10	7.5YR 4/3	None		None	None	Blocky	Strong	Firm	
13-20	Clay Loam	10	7.5YR 4/4	10YR 5/2	Depletions	S2	Blocky	Strong	Extremely Firm		
				5YR 4/6	Concentrations	S1					
20-30	Clay Loam	5	5YR 4/4	10YR 6/2	Depletions	S2	Blocky	Strong	Extremely Firm		
				5YR 5/6	Concentrations	S1					

Comments: Limiting Layer - 13" soil credit

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

<u>Jesse Kloeppner</u>	<u></u>	<u>L4043</u>	<u>5/23/2023</u>
(Designer/Inspector)	(Signature)	(License #)	(Date)

**Optional Verification:** I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

<u></u>	<u></u>	<u></u>	<u></u>
(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)



# Soil Observation Log


Project ID:

v 03.15.2023

Client: <u>Otto</u>				Location / Address: <u>8286 Hidden Bay Ct N, Lake Elmo, MN 55402</u>							
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input checked="" type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter <input type="checkbox"/> Disturbed/Fill											
Landscape Position: <u>Shoulder</u>				Slope %: <u>12.0</u>		Slope shape: <u>Convex, Convex</u>			Flooding/Run-On potential: <u>No</u>		
Vegetation: <u>Lawn</u>			Soil survey map units: <u>1033; Udifluvents</u>				Surface Elevation-Relative to benchmark: <u>936.0</u>				
Date/Time of Day/Weather Conditions: <u>5/23/2023</u>			<u>1:50 PM</u>		<u>Sunny</u>			Limiting Layer Elevation: <u>936.0</u>			
Observation #/Location: <u>SB2</u>		<u>Northwest end of Mound STA</u>				Observation Type: <u>Auger</u>					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I				
							Shape	Grade	Consistence		
0-6	Fine Sandy Loam	0	10YR 3/2	None		None	None	Granular	Weak	Friable	
6-10	Silt Loam	0	10YR 3/4	None		None	None	Blocky	Moderate	Friable	
10-13	Clay Loam	5	7.5YR 4/4	10YR 5/2	Depletions	S2	Blocky	Strong	Firm		
13-20	Clay Loam	0	7.5YR 4/6	10YR 6/2	Depletions	S2	Blocky	Strong	Extremely Firm		
				7.5YR 4/6	Concentrations	S1					
20-30	Clay Loam	0	5YR 4/4	10YR 6/2	Depletions	S2	Blocky	Strong	Extremely Firm		
				5YR 5/6	Concentrations	S1					

Comments: Limiting Layer - 0" soil credit.

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

<u>Jesse Kloeppner</u>	<u></u>	<u>L4043</u>
(Designer/Inspector)	(Signature)	(License #)

**Optional Verification:** I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

<u></u>	<u></u>	<u></u>
(LGU/Designer/Inspector)	(Signature)	(Cert #)





# Soil Observation Log


Project ID:

v 03.15.2023

Client: <u>Otto</u>				Location / Address: <u>8286 Hidden Bay Ct N, Lake Elmo, MN 55402</u>							
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input checked="" type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter <input type="checkbox"/> Disturbed/Fill											
Landscape Position: <u>Shoulder</u>				Slope %: <u>4.0</u>		Slope shape: <u>Convex, Convex</u>			Flooding/Run-On potential: <u>No</u>		
Vegetation: <u>Lawn</u>			Soil survey map units: <u>1033; Udifluvents</u>				Surface Elevation-Relative to benchmark: <u>936.0</u>				
Date/Time of Day/Weather Conditions: <u>5/23/2023</u>			<u>2:05 PM</u>		<u>Sunny</u>			Limiting Layer Elevation: <u>936.0</u>			
Observation #/Location: <u>SB3</u>		<u>Northeast end of Mound STA</u>				Observation Type: <u>Auger</u>					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I				
							Shape	Grade	Consistence		
0-6	Loam	5	10YR 3/2	None		None	None	Granular	Weak	Friable	
6-10	Loam	0	10YR 3/4	None		None	None	Granular	Weak	Friable	
10-20	Medium Sand	0	10YR 4/3	None		None	None	Single grain	Structureless	Loose	
20-30	Medium Sand	0	10YR 5/3	None		None	None	Single grain	Structureless	Loose	
30-46	Fine Sandy Loam	0	10YR 3/3	10YR 4/6	Concentrations	S1	Granular	Weak	Friable		
			10YR 3/2	10YR 5/2	Depletions	S2					


Comments: Limiting Layer - 0" soil credit.

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

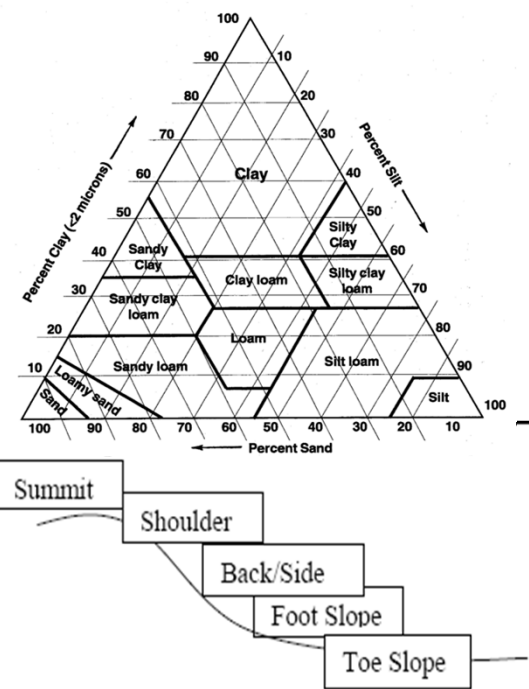
<u>Jesse Kloeppner</u>	<u></u>	<u>L4043</u>	<u>5/23/2023</u>
(Designer/Inspector)	(Signature)	(License #)	(Date)

**Optional Verification:** I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

<u></u>	<u></u>	<u></u>	<u></u>
(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)

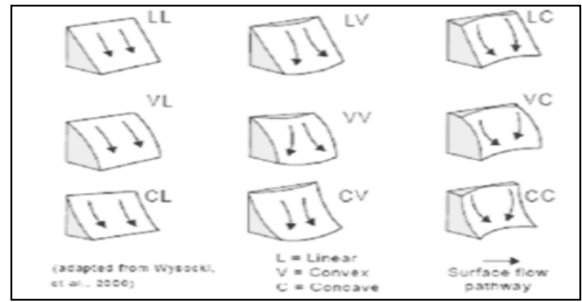
Client: Otto				Location / Address: 8286 Hidden Bay Ct N, Lake Elmo, MN 55402							
Soil parent material(s): (Check all that apply)				<input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input checked="" type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter <input type="checkbox"/> Disturbed/Fill							
Landscape Position: Shoulder			Slope %: 4.0		Slope shape: Convex, Convex			Flooding/Run-On potential: No			
Vegetation: Lawn		Soil survey map units: 1033; Udifluvents			Surface Elevation-Relative to benchmark: 937.0						
Date/Time of Day/Weather Conditions:		5/23/2023		1:35 PM		Sunny		Limiting Layer Elevation: 937.0			
Observation #/Location:		SP1		Southeast Corner of Mound Upslope			Observation Type: Pit				
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I				
							Shape	Grade	Consistence		
0-6	Fine Sandy Loam	5	10YR 3/2	None		None	None	Granular	Weak	Friable	
6-12	Loam	5	10YR 3/4	None		None	None	Granular	Weak	Friable	
12-19	Coarse Sand	>50	10YR 4/3	None		None	None	Single grain	Structureless	Loose	
19-33	Medium Sand	10	10YR 5/3	None		None	None	Single grain	Structureless	Loose	
33-45	Loamy Fine Sand	5	10YR 4/2	10YR 6/2	Depletions	S2	Granular	Weak	Friable		
			10YR 3/2	10YR 5/6	Concentrations	S1					
Comments: Limiting Layer - 0" soil credit - The boring is the side of the Existing Mound. Remove soil to 936.5' to build new mound. Cut soil to 936.5'.											
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.											
Jesse Kloeppner						L4043		5/23/2023			
(Designer/Inspector)			(Signature)			(License #)		(Date)			
Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.											
(LGU/Designer/Inspector)			(Signature)			(Cert #)		(Date)			

<b>Textures:</b> C Clay SiC Silty Clay SC Sandy Clay CL Clay Loam SiCL Silty Clay Loam SCL Sandy Clay Loam Si Silt SiL Silty Loam L Loam SL Sandy Loam* LS Loamy Sand* S Sand*	<b>*Sand Modifiers:</b> Co Coarse M Medium F Fine VF Very Fine  <b>Subsoil Indicator(s) of Saturation:</b> S1. Depleted matrix (value $\geq 4$ and chroma $\leq 2$ ) S2. Distinct gray or red redox features (any Matrix Hue) S3. Matrix Hue of 5Y with a chroma $\leq 3$ S4. Matrix Hue of 7.5 YR or redder with faint redox concentrations or redox depletions	<b>Topsoil Indicator(s) of Saturation:</b> T1. Wetland Vegetation T2. Depressional Landscape T3. Organic texture or organic modifiers T4. N 2.5/ 0 color T5. Redox features in topsoil T6. Hydraulic indicators
<b>Shape:</b>  <u>Granular</u>  <u>Platy</u>  <u>Blocky</u>  <u>Prismatic</u>  <u>Single Grain</u>	The peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots when soil is turned over.  The peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas just below the leaf litter or shallow topsoil.  The peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are castings of the faces of surrounding peds. Blocky structure is commonly found in the lower topsoil and subsoil.  Flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically casts or molds of adjoining peds. Prismatic structure is commonly found in the lower subsoil.  The structure found in a sandy soil. The individual particles are not held together.	
<b>Grade:</b>  <u>Loose</u> <u>Weak</u> <u>Moderate</u>  <u>Strong</u>  <u>Massive</u>	No peds, sandy soil Poorly formed, indistinct peds, barely observable in place Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed soil  Durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed  No observable aggregates, or no orderly arrangement of natural lines of weakness	
<b>Consistence:</b>  <u>Loose</u> <u>Friable</u> <u>Firm</u> <u>Extremely Firm</u>  <u>Rigid</u>	Intact specimen not available Slight force between fingers Moderate force between fingers Moderate force between hands or slight foot pressure Foot pressure	



**Slope Shape:**

Slope shape is described in two directions: up and down slope (perpendicular to the contour), and across slope (along the horizontal contour); e.g. Linear, Convex or LV'.



<b>1. PROJECT INFORMATION</b>		v 03.15.2023
Property Owner/Client:	<input type="text" value="Otto"/>	Project ID: <input type="text"/>
Site Address:	<input type="text" value="8286 Hidden Bay Ct N, Lake Elmo, MN 55402"/>	Date: <input type="text" value="06/01/23"/>
Email Address:	<input type="text"/>	Phone: <input type="text"/>
<b>2. DESIGN FLOW &amp; WASTE STRENGTH</b> <i>Attach waste strength data/estimated strength for Other Establishments</i>		
Design Flow:	<input type="text" value="450"/> GPD	Anticipated Waste Type: <input type="text" value="Residential"/>
BOD:	<input type="text" value="170"/> mg/L	TSS: <input type="text" value="60"/> mg/L
		Oil & Grease: <input type="text" value="25"/> mg/L
Treatment Level:	<input type="text" value="C"/> <i>Select Treatment Level C for residential septic tank effluent</i>	
<b>3. HOLDING TANK SIZING</b>		
Minimum Capacity: Residential = 1000 gal or 400 gal/bedroom, Other Establishment = Design Flow x 5.0, Minimum size 1000 gallons		
Code Minimum Holding Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Recommended Holding Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Type of High Level Alarm:	<input type="text"/> (Set @ 75% tank capacity)	
Comments:	<input type="text"/>	
<b>4. SEPTIC TANK SIZING</b>		
<b>A. Residential dwellings:</b>		
Number of Bedrooms (Residential):	<input type="text" value="3"/>	
Code Minimum Septic Tank Capacity:	<input type="text" value="2000"/> Gallons	with <input type="text" value="2"/> Tanks or Compartments
Recommended Septic Tank Capacity:	<input type="text" value="2000"/> Gallons	with <input type="text" value="2"/> Tanks or Compartments
Effluent Screen & Alarm (Y/N):	<input type="text" value="Yes"/>	Model/Type: <input type="text" value="PolyLok 525"/>
<b>B. Other Establishments:</b>		
Waste received by:	<input type="text"/>	<input type="text"/> GPD x <input type="text"/> Days Hyd. Retention Time
Code Minimum Septic Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Recommended Septic Tank Capacity:	<input type="text"/> Gallons	with <input type="text"/> Tanks or Compartments
Effluent Screen & Alarm (Y/N):	<input type="text"/>	Model/Type: <input type="text"/>
<small>* Other Establishments Require Department of Labor and Industry Approval and Inspection for Building Sewer *</small>		
<b>5. PUMP TANK SIZING</b>		
<b>Soil Treatment Dosing Tank</b>		<b>Other Component Dosing Tank:</b>
Pump Tank Capacity (Minimum):	<input type="text" value="1000"/> Gal	Pump Tank Capacity (Minimum): <input type="text"/> Gal
Pump Tank Capacity (Recommended):	<input type="text" value="1000"/> Gal	Pump Tank Capacity (Recommended): <input type="text"/> Gal
Pump Req: <input type="text" value="19.0"/> GPM	Total Head: <input type="text" value="11.7"/> ft	Pump Req: <input type="text"/> GPM
		Total Head: <input type="text"/> ft
Supply Pipe Dia. <input type="text" value="2.00"/> in	Dose Vol: <input type="text" value="110.0"/> gal	Supply Pipe Dia. <input type="text"/> in
		Dose Vol: <input type="text"/> Gal
<small>* Flow measurement device must be incorporated for any system with a pump: Elapsed Time Meter and/or Event Counter *</small>		

<b>6. SYSTEM AND DISTRIBUTION TYPE</b>		Project ID: _____
Soil Treatment Type:	<input type="text" value="Mound"/>	Distribution Type: <input type="text" value="Pressure Distribution-Level"/>
Elevation Benchmark:	<input type="text" value="935.8"/> ft	Benchmark Location: <input type="text" value="Top of Existing Pump Tank Manho"/>
MPCA System Type:	<input type="text" value="Type III"/>	Distribution Media: <input type="text" value="Rock"/>
Type III/IV/V Details:	<input of="" sand"="" type="text" value="Mound will use 36"/>	

<b>7. SITE EVALUATION SUMMARY:</b>		
Describe Limiting Condition: <input type="text" value="Redoximorphic Features/Saturated Soils"/>		
Layers with >35% Rock Fragments? (yes/no) <input type="text" value="No"/> If yes, describe below: % rock and layer thickness, amount of soil credit and any additional information for addressing the rock fragments in this design.		
Note: <input type="text" value="See Soil Boring Logs"/>		
Depth Limiting Condition: <input type="text" value="0"/> inches Minimum Req'd Separation: <input type="text" value="36"/> inches Code Max System Depth*: <input type="text" value="Mound"/> inches	Depth <input type="text" value="0.0"/> ft <input type="text" value="3.0"/> ft <input type="text" value="-3.0"/> ft	Elevation of Limiting Condition <input type="text" value="936.50"/> ft Elevation <input type="text" value="939.50"/> ft Elevation OK
<i>Critical for system compliance          Distribution Elevation &gt; Code Max Depth</i>		
*This is the maximum depth to the bottom of the distribution media for required separation. Negative Depth (ft) requires a mound.		
Designed Distribution Elevation: <input type="text" value="939.5"/> ft    Minimum Sand Depth: <input type="text" value="36.0"/> inches		

A. Soil Texture: <input type="text" value="Clay Loam"/>	B. Organic Loading Rate (optional): <input type="text"/> lbs/sq.ft/day    0
C. Soil Hyd. Loading Rate: <input type="text" value="0.45"/> GPD/ft <sup>2</sup>	D. Percolation Rate: <input type="text"/> MPI
E. Contour Loading Rate: <input type="text" value="10"/>	Note: <input type="text"/>
F. Measured Land Slope: <input type="text" value="12.0"/> %	Note: <input type="text"/>
Comments: <input type="text"/>	

<b>8. SOIL TREATMENT AREA DESIGN SUMMARY</b>		
<b>Trench:</b>		
Dispersal Area <input type="text"/> sq.ft	Sidewall Depth <input type="text"/> in	Trench Width <input type="text"/> ft
Total Lineal Feet <input type="text"/> ft	No. of Trenches <input type="text"/>	Code Max. Trench Depth <input type="text"/> in
Contour Loading Rate <input type="text"/> ft	Minimum Length <input type="text"/> ft	Designed Trench Depth <input type="text"/> in
<b>Bed:</b>		
Dispersal Area <input type="text"/> sq.ft	Sidewall Depth <input type="text"/> in	Maximum Bed Depth <input type="text"/> in
Bed Width <input type="text"/> ft	Bed Length <input type="text"/> ft	Designed Bed Depth <input type="text"/> in
<b>Mound:</b>		
Dispersal Area <input type="text" value="450.0"/> sq.ft	Bed Length <input type="text" value="45.0"/> ft	Bed Width <input type="text" value="10.0"/> ft
Absorption Width <input type="text" value="26.0"/> ft	Clean Sand Lift <input type="text" value="3.0"/> ft	Berm Width (0-1%) <input type="text"/> ft
Upslope Berm Width <input type="text" value="11.1"/> ft	Downslope Berm <input type="text" value="29.1"/> ft	Endslope Berm Width <input type="text" value="18.6"/> ft
Total System Length <input type="text" value="82.2"/> ft	System Width <input type="text" value="50.1"/> ft	Contour Loading Rate <input type="text" value="10.0"/> gal/ft

Project ID:

## At-Grade:

Dispersal Area  sq.ft      Bed Length  ft      Bed Width  ft  
Upslope Berm  ft      Downslope Berm  ft      Finished Height  ft  
System Length  ft      Endslope Berm  ft      System Width  ft

## Level & Equal Pressure Distribution Soil Treatment Area

No. of Laterals  3      Lateral Diameter  1.50 in      Lateral Spacing  3 ft  
Perforation Spacing  3 ft      Perforation Diameter  3/16 in      Drainback Volume  2 gal  
Min Dose Volume  57 gal      Max Dose Volume  113 gal      Total Dosing Volume  112 gal

## 9. Organic Loading and Additional Info for At-Risk, HSW or Type IV Design

### Organic Loading to Soil Treatment

A. Starting BOD Concentration = Design Flow X 0.7 X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

gpd X  mg/L X 8.35 ÷ 1,000,000 =  lbs. BOD/day (Organic Loading Design)

B. Organic Loading to Soil Treatment Area: (enter loading value in 7B)

mg/L X  gpd X 0.7 X 8.35 ÷ 1,000,000 ÷  sq.ft =  lbs./day/sqft

### HSW Technology Strength Reduction

A. Starting BOD Concentration = Design Flow X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

gpd X  mg/L X 8.35 ÷ 1,000,000 =  lbs. BOD/day (HSW Technology Design)

B. Target BOD Concentration = Design Flow X Target BOD (mg/L) X 8.35 ÷ 1,000,000

gpd X  mg/L X 8.35 ÷ 1,000,000 =  lbs. BOD/day (HSW Technology Design)

Lbs. BOD To Be Removed:  lbs. BOD/day (HSW Technology Design)

Pretreatment Technology:  \*Must Meet or Exceed Target

Disinfection Technology:  \*Required for Levels A & B

## 10. Comments/Special Design Considerations:

1. Minimum Volumes for New Tanks: 1st Tank 1,000-gallons; 2nd Tank 1,000-gallons; Pump Tank 1,000-gallons.
2. The location for the sewage tanks is only proposed. Discuss options with Licensed Installer.
3. The new tanks must be placed with no more than 4' of cover if possible.
4. The existing tanks and mound will be removed and abandoned. The mound will be removed to an elevation of 936.5' to build the new mound. Scratch the entire soil absorption area.
5. Carefully remove trees in the soil treatment area.
6. A retaining wall may be necessary to allow the Eastern edge of the mound to be reduced from 941.5' to 933.4' at the edge of the property to the East.
7. All berm slopes are calculated using 3:1 slope ratio. Berm slopes cannot extend beyond the edge of property. Additional can be used to grade the berms if desired.
8. According to the survey data available from E.G. Rud, this plan will require a variance of 36' 8" to the OHWM of 929.3' along the Lake Shore and Channel. The City of Lake Elmo must grant this variance.

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

Jesse Kloeppner

(Designer)



(Signature)

L4043

(License #)

06/01/23

(Date)

# Mound Design Worksheet

## ≥1% Slope

1. SYSTEM SIZING: Project ID: v 03.15.2023

- A. Design Flow:  GPD
- B. Soil Loading Rate:  GPD/sqft
- C. Depth to Limiting Condition  ft
- D. Percent Land Slope:  %
- E. Media (Sand) Loading Rate:  GPD/sqft
- F. Mound Absorption Ratio:

Table I MOUND CONTOUR LOADING RATES:				
Measured Perc Rate	← OR →	Texture - derived mound absorption ratio		Contour Loading Rate:
≤ 60mpi		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/ft <sup>2</sup> )	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft <sup>2</sup> )	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. Hydraulic Absorption Required Bottom Area: Design Flow (1A) ÷ Design Media Loading Rate(1E)

$$\frac{450 \text{ GPD}}{1.0 \text{ GPD/sqft}} = 450 \text{ sq.ft}$$

### Organic Sizing (OPTIONAL)

- B. Organic Absorption Bed Area = Organic Loading (Summary 9A) ÷ Organic Soil Loading Rate (Summary 7B)

$$\text{[Blank]} \text{ lbs BOD} \div \text{[Blank]} \text{ lbs BOD/sq.ft} = \text{[Blank]} \text{ sq.ft}$$

- C. Required Bed Area = Greater of Hydraulic (1D) or Organic Bed Area (1E)  sq.ft

- D. Designed Dispersal Media Area:  sq.ft *Optional upsizing of area to be larger than 2C*

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

- C. Calculate Contour Loading Rate: Bed Width(2B) X Design Media Loading Rate(1E)

$$10 \text{ ft} \times 1.0 \text{ GPD/sqft} = 10.0 \text{ gal/ft} \quad \text{Can not exceed Table 1}$$

- D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area(2A) ÷ Bed Width(2B)

$$\frac{450 \text{ sqft}}{10.0 \text{ ft}} = 45.0 \text{ ft}$$

If a larger dispersal media Length is desired, enter size:  ft

## 3. ABSORPTION AREA SIZING

- A. Calculate Absorption Width: Bed Width(2B) X Mound Absorption Ratio(1F)

$$10.0 \text{ ft} \times 2.6 = 26.0 \text{ ft}$$

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

Calculate Downslope Absorption Width: Absorption Width(1F) - Bed Width(2B)

$$26.0 \text{ ft} - 10.0 \text{ ft} = 16.0 \text{ ft}$$



## 4. DISTRIBUTION MEDIA:

Project ID:

Select Dispersal Media:

Rock

Enter Either 4A or 4B

## A. Rock Depth Below Distribution Pipe

6

in

## B. Registered Media

Registered Media Depth

in

Check registered product  
information for specific  
application details and design

Specific Media Comments:

## 5. MOUND SIZING

Project ID:

## A. Clean Sand Lift: Required Separation - Depth to Limiting Condition = Clean Sand Lift (1 ft minimum)

3.0

ft

-

ft

=

3.0

ft

Design Sand Lift (optional):

ft

## B. Upslope Height: Clean Sand Lift(6A) + Depth of Media(4AorB) +Depth to Cover Pipe+ Depth of Cover (1 ft)

3.0

ft

+

0.50

ft

+

0.5

ft

+

1.0

ft

=

5.0

ft

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

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

2.21

## D. Calculate Upslope Berm Width: Multiplier (5C) X Upslope Mound Height (5B)

2.21

X

5.0

ft

=

11.1

ft

## E. Calculate Drop in Elevation Under Bed: Bed Width(2B) X Land Slope(1D) ÷ 100 = Drop (ft)

10.0

ft

X

12.0

%

÷

100

=

1.20

ft

## F. Calculate Downslope Mound Height: Upslope Height(5B) + Drop in Elevation(5E)

5.0

ft

+

1.20

ft

=

6.2

ft

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

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

4.69

## H. Calculate Downslope Berm Width: Downslope Multiplier(5G) X Downslope Height (5F)

4.69

x

6.2

ft

=

29.1

ft

## I. Calculate Minimum Berm to Cover Absorption Area: Downslope Absorption Width(3A) + 4 feet

16.0

ft

+

4

ft

=

20.0

ft

## J. Design Downslope Berm = greater of 5H and 5I:

29.1

ft

## K. Select Endslope Berm Multiplier:

3.00

(usually 3.0 or 4.0)

## L. Calculate Endslope Berm Width = Endslope Berm Multiplier(5K) X Downslope Mound Height(5F)

3.00

X

6.2

ft

=

18.6

ft

## M. Calculate Mound Width: Upslope Berm Width(5D) + Bed Width(2B) + Downslope Berm Width(5J)

11.1

ft

+

10.0

ft

+

29.1

ft

=

50.1

ft

## N. Calculate Mound Length: Endslope Berm Width (5L) + Bed Length(2D) + Endslope Berm Width(5L)

18.6

ft

+

45.0

ft

+

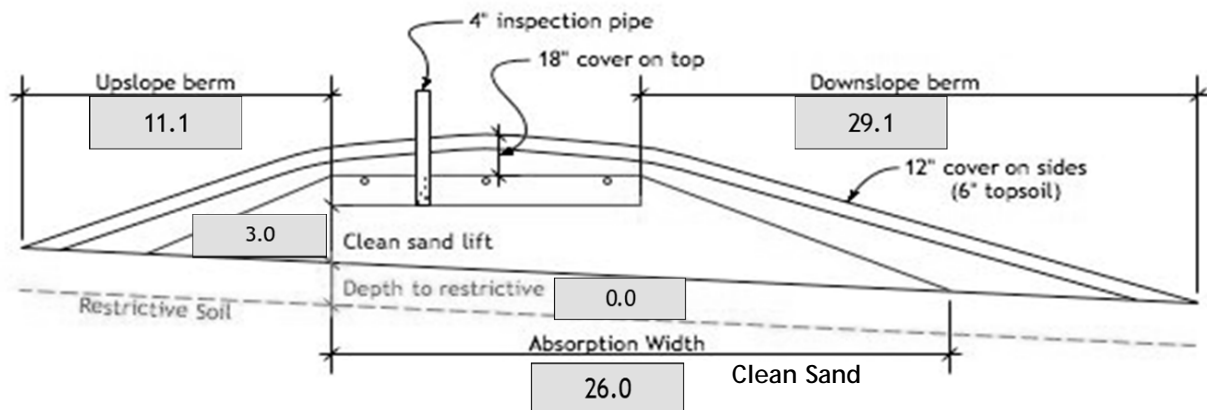
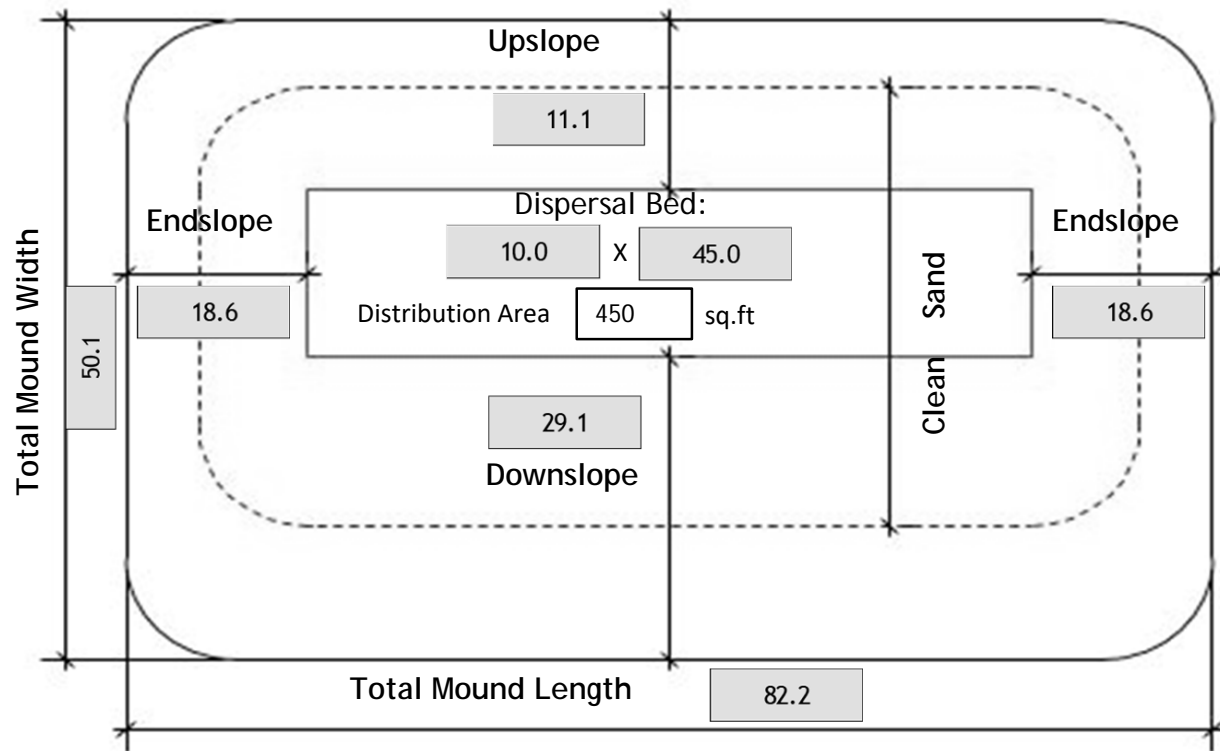
18.6

ft

=

82.2

ft



		Elevation to Benchmark	
Required Separation:	36 (in)	Elevation Limiting Layer:	936.5 ft
Distribution Media:	Rock	Elevation required Separation:	939.5 ft
Media Depth:	6.0 (in)	Elevation Distribution Media Bottom:	939.5 ft
Manifold Connection:	End	Elevation Top of Media(min):	940.5 ft
Lateral Pipe Diameter:	1.50 (in)	Elevation Top of System(min):	941.5 ft
Perforation Size:	3/16 (in)	Perforation Spacing:	36.0 (in)

If Split and Non-Level Pressure Distribution Used: See Non-Level Pressure Distribution Form

Comments:

All berm slopes calculated using 3:1 slope ratio.

# Mound Materials Worksheet

Project ID:

v 03.15.2023

**A. Rock Volume:** (Rock Below Pipe + Rock to cover pipe (*pipe outside dia + ~2 inch*)) X Bed Length X Bed Width = Volume

$$(\boxed{6} \text{ in} + \boxed{2.0} \text{ in}) \div 12 \times \boxed{45.0} \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{300.0} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards:  $\boxed{300.0} \text{ cu.ft} \div 27 = \boxed{11.1} \text{ cu.yd}$

Add 30% for constructability:  $\boxed{11.1} \text{ cu.yd} \times 1.3 = \boxed{14.4} \text{ cu.yd}$

**B. Calculate Clean Sand Volume:**

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

$$\boxed{3.6} \text{ ft} \times \boxed{10.0} \text{ ft} \times \boxed{45} \text{ ft} = \boxed{1620} \text{ cu.ft}$$

**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)*

$$\boxed{\phantom{000}} \text{ ft} - 1) \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} \text{ ft} = \boxed{\phantom{000}}$$

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

$$\boxed{\phantom{000}} \text{ ft} - 1) \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} \text{ ft} = \boxed{\phantom{000}}$$

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

$$\boxed{\phantom{000}} \text{ cu.ft} + \boxed{\phantom{000}} \text{ cu.ft} + \boxed{\phantom{000}} \text{ cu.ft} = \boxed{\phantom{000}} \text{ cu.ft}$$

**For a Mound on a slope greater than 1%**

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

$$((\boxed{5.0} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{45.0}) \div 2 = \boxed{270.0} \text{ cu.ft}$$

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

$$((\boxed{6.2} \text{ ft} - 1) \times \boxed{16.0} \text{ ft} \times \boxed{45.0}) \div 2 = \boxed{1872.0} \text{ cu.ft}$$

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

$$(\boxed{6.2} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{156.0} \text{ cu.ft}$$

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

$$\boxed{270.0} \text{ cu.ft} + \boxed{1872.0} \text{ cu.ft} + \boxed{156.0} \text{ cu.ft} + \boxed{1620.0} \text{ cu.ft} = \boxed{3918.0} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards:  $\boxed{3918.0} \text{ cu.ft} \div 27 = \boxed{145.1} \text{ cu.yd}$

Add 30% for constructability:  $\boxed{145.1} \text{ cu.yd} \times 1.3 = \boxed{188.6} \text{ cu.yd}$

**C. Calculate Sandy Berm Volume:**

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

$$(\boxed{5.6} - 0.5) \text{ ft} \times \boxed{50.1} \text{ ft} \times \boxed{82.2} \div 2 = \boxed{10507.3} \text{ cu.ft}$$

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

$$\boxed{10507.3} \text{ cu.ft} - \boxed{3918.0} \text{ cu.ft} - \boxed{300.0} \text{ cu.ft} = \boxed{6289.3} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards:  $\boxed{6289.3} \text{ cu.ft} \div 27 = \boxed{232.9} \text{ cu.yd}$

Add 30% for constructability:  $\boxed{232.9} \text{ yd}^3 \times 1.3 = \boxed{302.8} \text{ cu.yd}$

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

$$\boxed{50.1} \text{ ft} \times \boxed{82.2} \text{ ft} \times 0.5 \text{ ft} = \boxed{2060.3} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards:  $\boxed{2060.3} \text{ cu.ft} \div 27 = \boxed{76.3} \text{ cu.yd}$

Add 30% for constructability:  $\boxed{76.3} \text{ cu.yd} \times 1.3 = \boxed{99.2} \text{ cu.yd}$

Project ID:

v 03.15.2023

- Media Bed Width:  ft
- Minimum Number of Laterals in system/zone = Rounded up number of  $[(\text{Media Bed Width} - 4) \div 3] + 1$ .  

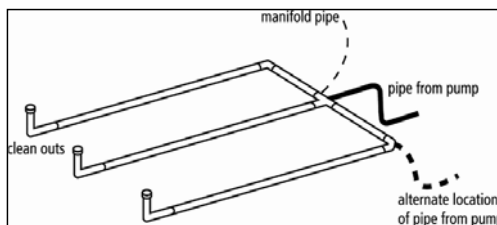
$$[(\text{10} - 4) \div 3] + 1 = \text{3} \text{ laterals} \quad \text{Does not apply to at-grades}$$
- Designer Selected Number of Laterals:  laterals  
*Cannot be less than line 2 (Except in at-grades)*
- Select Perforation Spacing:  ft
- Select Perforation Diameter Size:  in
- Length of Laterals = Media Bed Length(1.) - 2 Feet.  

$$\text{45.0} - 2\text{ft} = \text{43.0} \text{ ft} \quad \text{Perforation can not be closer then 1 foot from edge.}$$
- Determine the Number of Perforation Spaces. Divide the Length of Laterals(6.) by the Perforation Spacing(4.) and round down to the nearest whole number.  

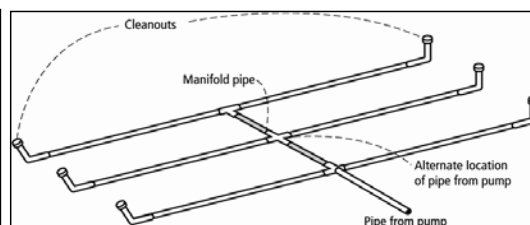
$$\text{Number of Perforation Spaces} = \text{43.0} \text{ ft} \div \text{3.0} \text{ ft} = \text{14} \text{ Spaces}$$
- Number of Perforations per Lateral is equal to 1.0 plus the Number of Perforation Spaces(7.). Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

Perforations Per Lateral =  Spaces + 1 =  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



END Connection



CENTER Connection

Perf Per Lateral:

Perf Per Lateral Equal Split:  |

OPTIONAL Perf Per Lateral Non-Equal Split\*:  |

\* must not exceed maximum number perfs per lateral in table

- Total Number of Perforations equals the Number of Perforations per Lateral (8.) multiplied by the Number of Perforated Laterals.(3.)

$$\text{15} \text{ Perf. Per Lat.} \times \text{3} \text{ Number of Perf. Lat.} = \text{45} \text{ Total Number of Perf.}$$

- Spacing of laterals; Must be greater than 1 foot and no more than 3 feet:  ft

- Select Type of Manifold Connection (End or Center):  If Center Manifold Connection the max number of perfs per lateral in the table can be doubled.
- Select Lateral Diameter (See Table):  in

13. Calculate the *Square Feet per Perforation*.

*Recommended value is 4-11 ft<sup>2</sup> per perforation, Does not apply to At-Grades*

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

10 ft X 45 ft = 450 sq.ft

b. *Square Foot per Perforation* = *Bed Area* ÷ by the *Total Number of Perfs*

450 sqft ÷ 45 perf = 10.0 sq.ft/perf

14. Select *Minimum Average Head*:

1.0 ft

15. Select *Perforation Discharge* based on Table:

0.41 GPM per Perf

16. *Flow Rate* = *Total Number of Perfs*(9.) X *Perforation Discharge*(15.)

45 Perfs X 0.41 GPM per Perforation = 19 GPM

17. *Volume of Liquid Per Foot of Distribution Piping* (Table II):

0.110 Gallons/ft

18. *Volume of Distribution Piping* = *Number of Perforated Laterals*(3.) X *Length of Laterals*(6.) X *Volume of Liquid Per Foot of Distribution Piping* (17.)

3 X 43 ft X 0.110 gal/ft = 14.2 Gallons

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

14.2 gals X 4 = 56.8 Gallons

20. Maximum Delivered Volume = Design flow x 25%

450.0 gpd X 25% = 112.5 Gallons

21. Minimum Delivered vs Maximum Delivered evaluation:

Volume ratio correct

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	3/16	7/32	1/4
1.0 <sup>a</sup>	0.18	0.41	0.56	0.74
1.5	0.22	0.51	0.69	0.9
2.0 <sup>b</sup>	0.26	0.59	0.80	1.04
2.5	0.29	0.65	0.89	1.17
3.0	0.32	0.72	0.98	1.28
4.0	0.37	0.83	1.13	1.47
5.0 <sup>c</sup>	0.41	0.93	1.26	1.65
1 foot	Dwellings with 3/16 inch to 1/4 inch perforations			
2 feet	Dwellings with 1/8 inch perforations			
5 feet	Other establishments and MSTs with 3/16 inch to 1/4 inch perforations			
	Other establishments and MSTs with 1/8 inch perforations			

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:

1. PUMP CAPACITY

Project ID:

v 03.15.2023

Pumping to Gravity or Pressure Distribution:

Pressure

A. If pumping to gravity enter the gallon per minute of the pump:

GPM (10 - 45 gpm)

B. If pumping to a pressurized distribution system:

19.0 GPM

C. Enter pump description:

Demand Dosing

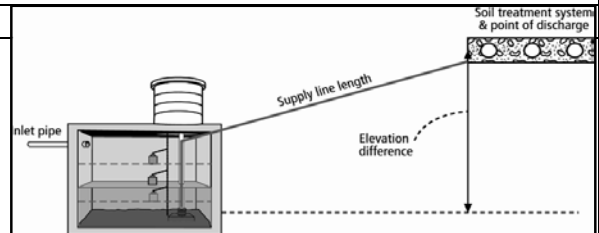
2. HEAD REQUIREMENTS

A. Elevation Difference 6.5 ft  
between pump and point of discharge:

B. Distribution Head Loss: 5 ft

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

\* Common additional head loss: gate valve = 1 ft each, globe valve = 1.5 ft each, splitter valve = see manufacturers details



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

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

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 13 ft

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

Friction Loss = 1.02 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 X 1.25 = Equivalent Pipe Length*

13 ft X 1.25 = 16.3 ft

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

Supply Friction Loss =

1.02 ft per 100ft X 16.3 ft ÷ 100 = 0.2 ft

H. *Total Head* requirement is the sum of the *Elevation Difference(2A)* + *Distribution Head Loss(2B)* + *Additional Head Loss(2C)* + *Supply Friction Loss(2G)*

6.5 ft + 5.0 ft + ft + 0.2 ft = 11.7 ft

3. PUMP SELECTION

A pump must be selected to deliver at least 19.0 GPM with at least 11.7 feet of total head.

Comments:

Goulds Pump PE41 Pump Curve: 51 GPM @ 11.7 TDH

Elevation Difference: Pump Intake (BURY DEPTH OF 4 FEET FROM 942.0') 933.5' to 940.0' = 6.5'

DETERMINE TANK CAPACITY AND DIMENSIONS

Project ID:

v 03.15.2023

1. A. Design Flow (Design Sum. 1A):  GPD C. Tank Use:

B. Min. required pump tank capacity:  Gal D. Recommended pump tank capacity:  Gal

2. A. Tank Manufacturer:  B. Tank Model:

C. Capacity from manufacturer:  Gallons

D. Gallons per inch from manufacturer:  Gallons per inch

E. Liquid depth of tank from manufacturer:  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

3. 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 (2D)

( in + 2 inches) X  Gallons Per Inch =  Gallons

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

-Item 19 of the Pressure Distribution STA or Item 11 of Non-level STA  Gallons (Minimum dose)  inches/dose

5. Calculate **Maximum Pumpout Volume** (25% of Design Flow(1A))

Design Flow:  GPD X 0.25 =  Gallons (Maximum dose)  inches/dose

6. Select a pumpout volume that meets both Minimum and Maximum:  Gallons

7. Calculate **Doses Per Day** = Design Flow(1A) ÷ Delivered Volume(6.)

gpd ÷  gal =  Doses\*

\* Doses need to be equal to or greater than 4

8. Calculate Drainback:

A. Diameter of Supply Pipe =  inches

B. Length of Supply Pipe =  feet

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

D. Drainback = Length of Supply Pipe(8B) X Volume of Liquid Per Lineal Foot of Pipe(8C)

ft X  gal/ft =  Gallons

9. Total Dosing Volume = Delivered Volume(6.) + Drainback (8D)

gal +  gal =  Gallons

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

in X  gal/in =  Gallons

11. Reserve Capacity Volume = [Tank Liquid Depth(2E) - Alarm Float Depth(10.)] x gallons per inch of tank(2D)

[ in -  in] X  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

DEMAND DOSE FLOAT SETTINGS

Alarm and Pump are to be wired on separate circuits and inspected by the electrical inspector

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

Total Dosing Volume(9.) ÷ Gallons Per Inch(2D)

gal ÷  gal/in =  inches

13. Measuring from bottom of tank:

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

in + 2 in =  inches

B. Distance to set Pump On Float = Distance to Set Pump-Off Float(13A) + Float Separation Distance(12.)

in +  in =  inches

C. Distance to set Alarm Float = Distance to set Pump-On Float(13B) + Alarm Depth (2-3 inches)(10.)

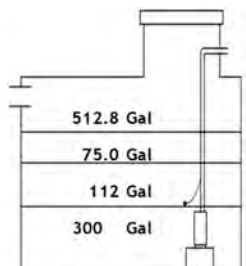
in +  in =  inches

Inches for Dose:  in

Alarm Depth:  in

Pump On:  in

Pump Off:  in







## 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	Email
Property Address	Property ID
System Designer	Contact Info
System Installer	Contact Info
Service Provider/Maintainer	Contact Info
Permitting Authority	Contact Info
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:

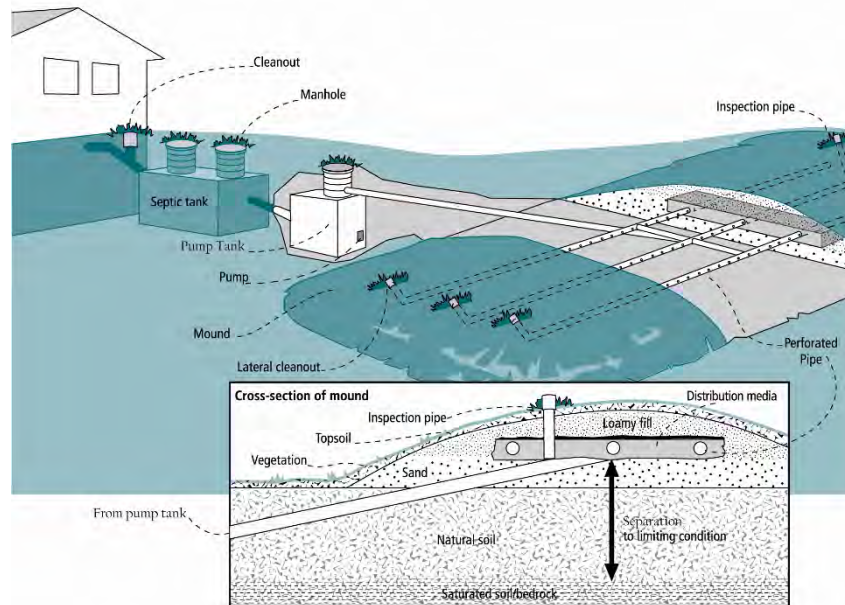
- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product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

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

**For more information see <http://septic.umn.edu>**



## 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					
<input type="checkbox"/> System is subject to operating permit* <input type="checkbox"/> System uses UV disinfection unit* Type of advanced treatment unit _____					

Dwelling Type	Well Construction
Number of bedrooms: _____	Well depth (ft): _____
System capacity/ design flow (gpd): _____	<input type="checkbox"/> Cased well Casing depth: _____
Anticipated average daily flow (gpd): _____	<input type="checkbox"/> Other (specify): _____
Comments _____	Distance from septic (ft): _____
Business? : Y N What type? _____	Is the well on the design drawing? Y N

Septic Tank	
<input type="checkbox"/> First tank Tank volume: _____ gallons	<input type="checkbox"/> Pump Tank _____ gallons
Does tank have two compartments? Y N	<input type="checkbox"/> Effluent Pump make/model: _____
<input type="checkbox"/> Second tank Tank volume: _____ gallons	Pump capacity _____ GPM
<input type="checkbox"/> Tank is constructed of _____	TDH _____ Feet of head
<input type="checkbox"/> Effluent screen: Y N Alarm Y N	<input type="checkbox"/> Alarm location _____

Soil Treatment Area (STA)	
Mound/At-Grade area (width x length): _____ ft x _____ ft	<input type="checkbox"/> Inspection ports <input type="checkbox"/> Cleanouts
Rock bed size (width x length): _____ ft x _____ ft	<input type="checkbox"/> Surface water diversions
Location of additional STA: _____	<input type="checkbox"/> Additional STA not available
Type of distribution media: _____	



## Homeowner Management Tasks

These operation 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 \_\_\_\_ 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 through 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: \_\_\_\_\_ gallons: Pump run time: \_\_\_\_\_ 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	<ul style="list-style-type: none"> <li>• Uses additional water.</li> <li>• Adds solids to the tank.</li> <li>• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of a garbage disposal is not recommended.</li> <li>• Minimize garbage disposal use. Compost instead.</li> <li>• To prevent solids from exiting the tank, have your tank pumped more frequently.</li> <li>• Add an effluent screen to your tank.</li> </ul>
Washing machine	<ul style="list-style-type: none"> <li>• Washing several loads on one day uses a lot of water and may overload your system.</li> <li>• Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose a front-loader or water-saving top-loader, these units use less water than older models.</li> <li>• 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.</li> <li>• Install a lint filter after the washer and an effluent screen to your tank</li> <li>• Wash only full loads and think even – spread your laundry loads throughout the week.</li> </ul>
Dishwasher	<ul style="list-style-type: none"> <li>• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area.</li> <li>• New models promote “no scraping”. They have a garbage disposal inside.</li> </ul>	<ul style="list-style-type: none"> <li>• Use gel detergents. Powdered detergents may add solids to the tank.</li> <li>• Use detergents that are low or no-phosphorus.</li> <li>• Wash only full loads.</li> <li>• Scrape your dishes anyways to keep undigested solids out of your septic system.</li> </ul>
Grinder pump (in home)	<ul style="list-style-type: none"> <li>• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Expand septic tank capacity by a factor of 1.5.</li> <li>• Include pump monitoring in your maintenance schedule to ensure that it is working properly.</li> <li>• Add an effluent screen.</li> </ul>
Large bathtub (whirlpool)	<ul style="list-style-type: none"> <li>• Large volume of water may overload your system.</li> <li>• Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid using other water-use appliances at the same time. For example, don’t wash clothes and take a bath at the same time.</li> <li>• Use oils, soaps, and cleaners in the bath or shower sparingly.</li> </ul>
<b>Clean Water Uses</b>	<b>Impacts on System</b>	<b>Management Tips</b>
High-efficiency furnace	<ul style="list-style-type: none"> <li>• Drip may result in frozen pipes during cold weather.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-route water directly out of the house. Do not route furnace discharge to your septic system.</li> </ul>
Water softener Iron filter Reverse osmosis	<ul style="list-style-type: none"> <li>• Salt in recharge water may affect system performance.</li> <li>• Recharge water may hydraulically overload the system.</li> </ul>	<ul style="list-style-type: none"> <li>• These sources produce water that is not sewage and should not go into your septic system.</li> <li>• Reroute water from these sources to another outlet, such as a dry well, drintile or old drainfield.</li> </ul>
Surface drainage Footing drains	<ul style="list-style-type: none"> <li>• Water from these sources will overload the system and is prohibited from entering septic system.</li> </ul>	<ul style="list-style-type: none"> <li>• When replacing, consider using a demand-based recharge vs. a time-based recharge.</li> <li>• Check valves to ensure proper operation; have unit serviced per manufacturer directions</li> </ul>



## Homeowner Maintenance Log

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

Activity	Date accomplished									
<b>Check frequently:</b>										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
<b>Check annually:</b>										
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:

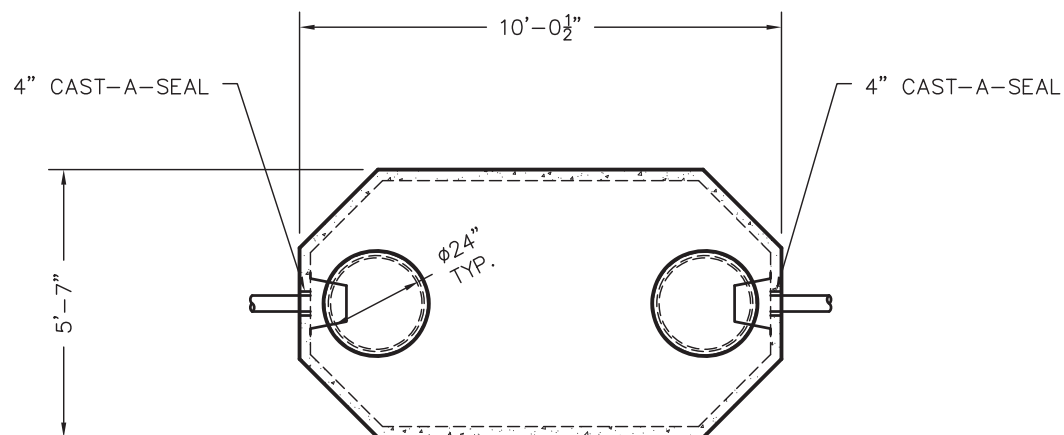
Date

Management Plan Prepared By:

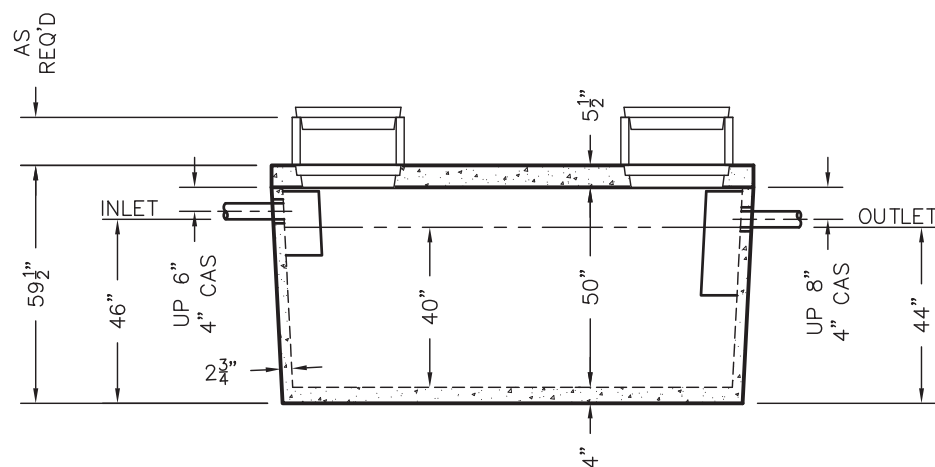
Certification #

Permitting Authority:





TOP VIEW



SIDE VIEW

## W1000-R END RISER TANK SPECIFICATIONS

### DIMENSIONS:

WALL: 2 3/4"  
 BOTTOM: 4"  
 COVER: 5 1/2"  
 MANHOLE: 24" I.D. PRECAST CONCRETE RISER  
 HEIGHT: 59 1/2"  
 LENGTH: 10'-0 1/2"  
 WIDTH: 5'-7"  
 BELOW INLET: 46"  
 LIQUID LEVEL: 40"  
 WEIGHT: 9,000 LBS.

### INLET AND OUTLET:

4" CAST-A-SEAL BOOT OR EQUAL GASKET

LIQUID CAPACITY: 25.00 GAL/IN

### HOLDING TANK:

OUTLET HOLE PLUGGED  
 ACTUAL CAPACITY: 1,136 GALLONS

LOADING DESIGN: 8'-0" UNSATURATED SOIL

### TANK CAN BE USED AS:

SEPTIC / HOLDING / PUMP OR SIPHON

COVER: MIX DESIGN #8 (NO FIBER)

TANK: MIX DESIGN #10 (STRUCTURAL FIBER)

### CUSTOMIZED TANKS:

FOR CUSTOM TANKS CONTACT WIESER CONCRETE

REVIEWED BY \_\_\_\_\_  
 REVIEW DATE \_\_\_\_\_

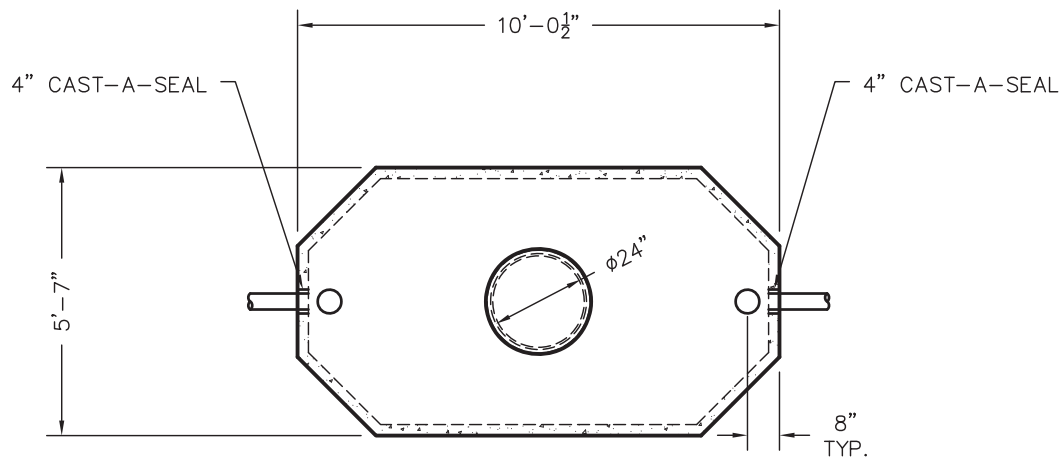
**DRAWINGS SUBMITTED  
FOR APPROVAL**

APPROVED BY: \_\_\_\_\_  
 APPROVAL DATE: \_\_\_\_\_  
 PRODUCTS NEEDED BY: \_\_\_\_\_

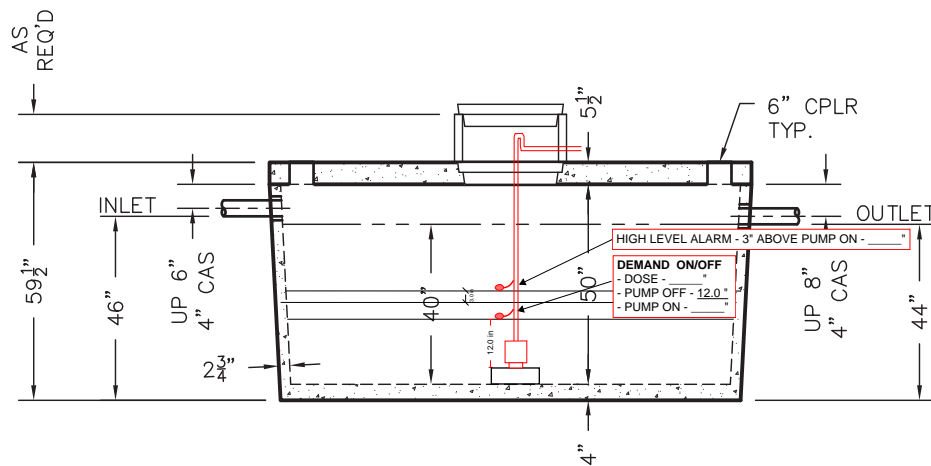
TANKS ARE MANUFACTURED TO MEET OR EXCEED ASTM C-1227 REQUIREMENTS

PRE-POUR:		DATE:		REV.		SCALE: 1/4" = 1'-0"		DRAWN BY: WCP		DATE: 00/00/00		FILE: w1000-r single lid	
POST-POUR:													
<b>WIESER CONCRETE</b>													
W3716 US HWY 10, MAIDEN ROCK, WI 54750													
800-325-8456													
W1000-R SINGLE LID													
SEPTIC MANUAL													
SHEET NO.													
1 OF 1													





TOP VIEW



SIDE VIEW

## W1000-R CENTER RISER TANK SPECIFICATIONS

### DIMENSIONS:

WALL: 2 3/4"  
 BOTTOM: 4"  
 COVER: 5 1/2"  
 MANHOLE: 24" I.D. PRECAST CONCRETE RISER  
 HEIGHT: 59 1/2"  
 LENGTH: 10'-0 1/2"  
 WIDTH: 5'-7"  
 BELOW INLET: 46"  
 LIQUID LEVEL: 40"  
 WEIGHT: 9,000 LBS.

### INLET AND OUTLET:

4" CAST-A-SEAL BOOT OR EQUAL GASKET

LIQUID CAPACITY: 25.00 GAL/IN

### HOLDING TANK:

OUTLET HOLE PLUGGED  
 ACTUAL CAPACITY: 1,136 GALLONS

LOADING DESIGN: 8'-0" UNSATURATED SOIL

### TANK CAN BE USED AS:

SEPTIC / HOLDING / PUMP OR SIPHON

COVER: MIX DESIGN #8 (NO FIBER)

TANK: MIX DESIGN #10 (STRUCTURAL FIBER)

### CUSTOMIZED TANKS:

FOR CUSTOM TANKS CONTACT WIESER CONCRETE

REVIEWED BY \_\_\_\_\_  
 REVIEW DATE \_\_\_\_\_

**DRAWINGS SUBMITTED  
FOR APPROVAL**

APPROVED BY: \_\_\_\_\_  
 APPROVAL DATE: \_\_\_\_\_  
 PRODUCTS NEEDED BY: \_\_\_\_\_

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

PRE-POUR:

DATE:

REV.

SCALE: 1/4" = 1'-0"

DRAWN BY: WCP

DATE: 00/00/00

FILE: w1000-r single lid

**WIESER CONCRETE**

W3716 US HWY 10, MAIDEN ROCK, WI 54750  
 800-325-8456

W1000-R SINGLE LID  
 SEPTIC MANUAL

SHEET NO.

1

OF

1

## PL-525 Filter

The PL-525 Filter is rated for 10,000 GPD (gallons per day) making it one of the largest filters in its class. It has 525 linear feet of 1/16" filtration slots. Like the Polylok PL-122, the Polylok PL-525 has an automatic shut-off ball installed with every filter. When the filter is removed for cleaning, the ball will float up and temporarily shut off the system so the effluent won't leave the tank.

### Features:

- Rated for 10,000 GPD (gallons per day).
- 525 linear feet of 1/16" filtration.
- Accepts 4" and 6" SCHD 40 pipe.
- Built in gas deflector.
- Automatic shut-off ball when filter is removed.
- Alarm accessibility.
- Accepts PVC extension handle.

### PL-525 Installation:

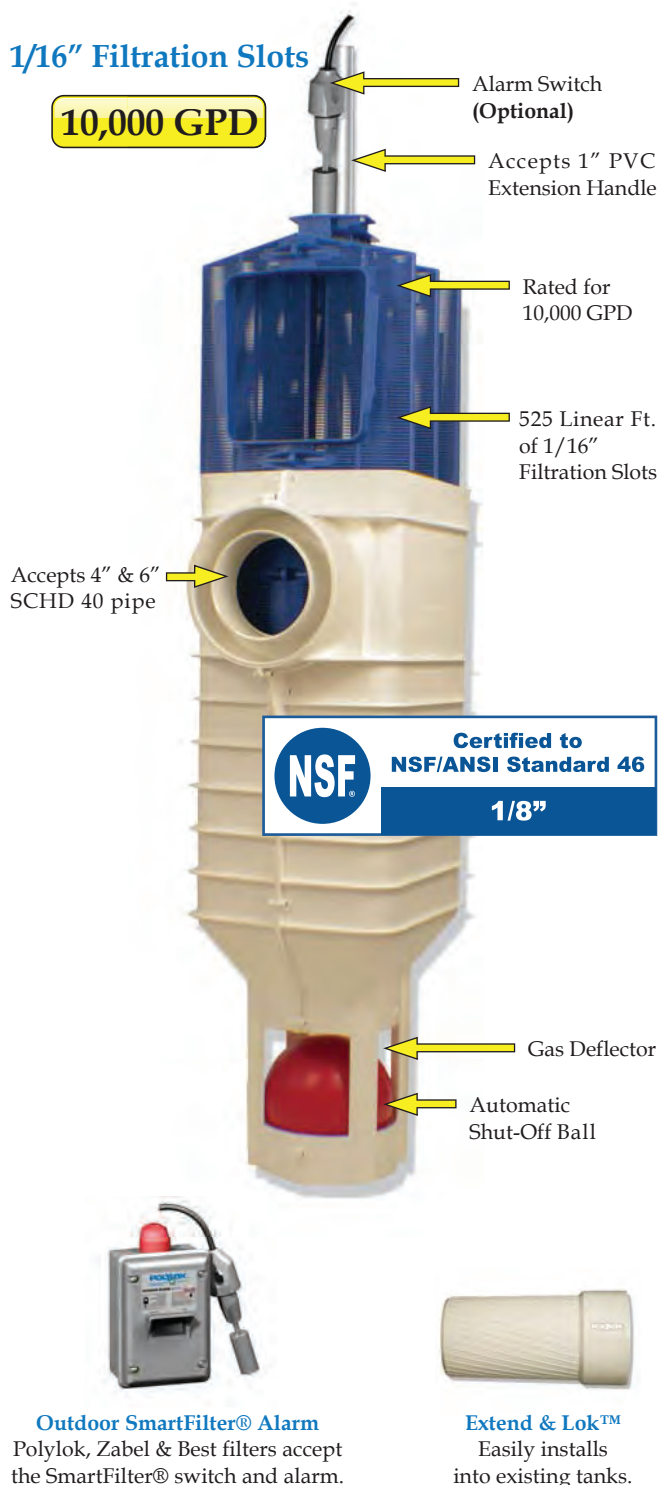
Ideal for residential and commercial waste flows up to 10,000 gallons per day (GPD).

1. Locate the outlet of the septic tank.
2. Remove the tank cover and pump tank if necessary.
3. Glue the filter housing to the 4" or 6" outlet pipe. If the filter is not centered under the access opening use a Polylok Extend & Lok or piece of pipe to center filter.
4. Insert the PL-525 filter into its housing.
5. Replace and secure the septic tank cover.

### PL-525 Maintenance:

The PL-525 Effluent Filters will operate efficiently for several years under normal conditions before requiring cleaning. It is recommended that the filter be cleaned every time the tank is pumped, or at least every three years. If the installed filter contains an optional alarm, the owner will be notified by an alarm when the filter needs servicing. Servicing should be done by a certified septic tank pumper or installer.

1. Locate the outlet of the septic tank.
2. Remove tank cover and pump tank if necessary.
3. Do not use plumbing when filter is removed.
4. Pull PL-525 cartridge out of the housing.
5. Hose off filter over the septic tank. Make sure all solids fall back into septic tank.
6. Insert the filter cartridge back into the housing making sure the filter is properly aligned and completely inserted.
7. Replace and secure septic tank cover.





# PE

SUBMERSIBLE EFFLUENT PUMP



### FEATURES

- Corrosion resistant construction
- Cast iron body
- Thermoplastic impeller and cover
- Upper sleeve and lower heavy duty ball bearing construction
- Motor is permanently lubricated for extended service life
- Powered for continuous operation
- All ratings are within the working limits of the motor
- Quick disconnect power cord, 20' standard length, heavy duty 16/3 SJTW with 115 or 230 volt grounding plug
- Complete unit is heavy duty, portable and compact
- Mechanical seal is carbon, ceramic, BUNA and stainless steel
- Stainless steel fasteners

### APPLICATIONS

Specially designed for the following uses:

- Mound Systems
- Effluent/Dosing Systems
- Low Pressure Pipe Systems
- Basement Draining
- Heavy Duty Sump/Dewatering

### SPECIFICATIONS

#### Pump - General:

- Discharge: 1½" NPT
- Temperature: 104°F (40°C) maximum, continuous when fully submerged.
- Solids handling: ½" maximum sphere.
- Automatic models include a float switch.
- Manual models available.
- Pumping range: see performance chart or curve.

#### PE31 Pump:

- Maximum capacity: 53 GPM
- Maximum head: 25' TDH

#### PE41 Pump:

- Maximum capacity: 61 GPM
- Maximum head: 29' TDH

#### PE51 Pump:

- Maximum capacity: 70 GPM
- Maximum head: 37' TDH

### MOTOR

#### General:

- Single phase, 60 Hz, 115 and 230 volts
- Built-in thermal overload protection with automatic reset
- Class B insulation
- Oil-filled design
- High strength carbon steel shaft

#### PE31 Motor:

- .33 HP, 3000 RPM
- 115 volts
- Shaded pole design

#### PE41 Motor:

- .40 HP, 3400 RPM
- 115 and 230 volts
- PSC design

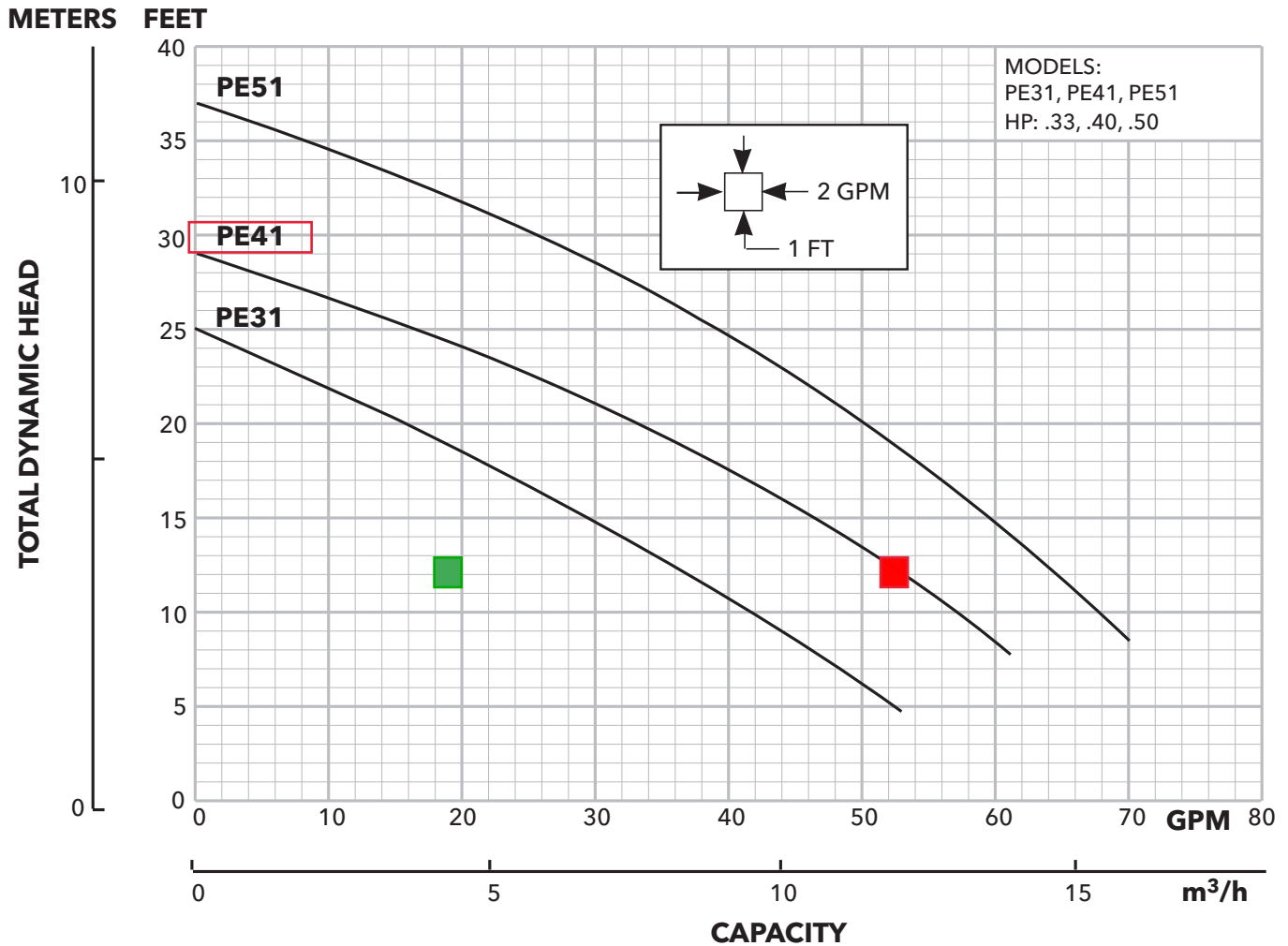
#### PE51 Motor:

- .50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

### AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards  
By Canadian Standards Association  
File #LR38549



### PUMP INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
PE31M	0.33	115	12	20	1	Manual / No Switch	20'	1.5"	18"	.5"	31 / 14.1
PE31P1						Piggyback Float Switch					
PE41M	0.4	230	7.5	15		Manual / No Switch					
PE41P1						Piggyback Float Switch					
PE42P1						Piggyback Float Switch					
PE51M	0.5	115	9.5	20		Manual / No Switch					
PE51P1						Piggyback Float Switch					
PE52M		230	4.7	10		Manual / No Switch					
PE52P1						Piggyback Float Switch					



## PERFORMANCE RATINGS

### PE31

Total Head (feet of water)	GPM
5	52
10	42
15	29
20	16
25	0

### PE41

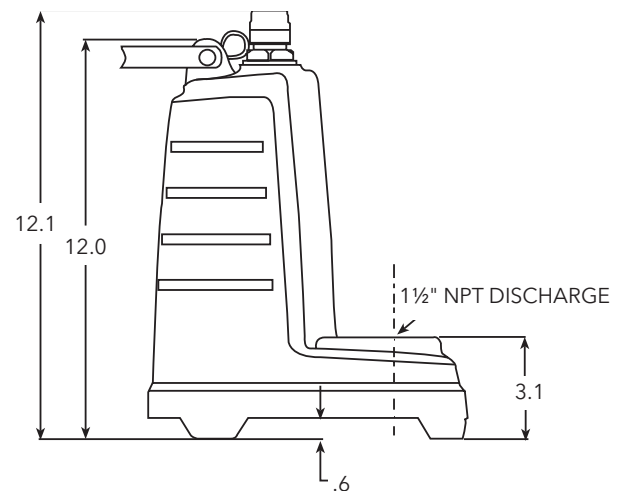
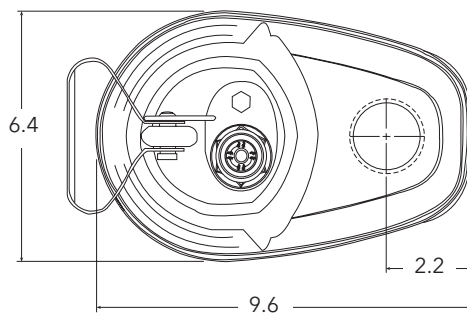
Total Head (feet of water)	GPM
8	61
10	57
15	46
20	33
25	16

### PE51

Total Head (feet of water)	GPM
10	67
15	59
20	50
25	39
30	26
35	8

## DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



Xylem Inc.  
2881 East Bayard Street Ext., Suite A  
Seneca Falls, NY 13148  
Phone: (866) 325-4210  
Fax: (888) 322-5877  
[www.xylem.com/goulds](http://www.xylem.com/goulds)

Goulds is a registered trademark of Goulds Pumps, Inc. and is used under license.  
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# SITE RESEARCH



7015  
8286 HIDDEN BAY  
TRAIL

LEGEND

- EX. SEPTIC TANK

- EX. DRYWELL

- EX. WELL

- EX. DRAINFIELD

- PROP. SEPTIC TANK

- PROP. PUMP STATION

- PROP. DRAINFIELD

- PROP. DISTRIB./DROP BOX

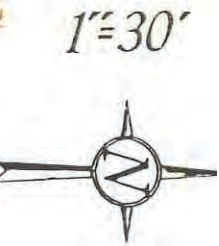
- PROP. 2" DISCHARGE PIPE

- PERCOLATION TEST OR SOIL BORING LOCATION

- PROP. MOUND SYSTEM

REMOVE EX. SEPTIC TANK.  
INSTALL PUMP STATION AND  
1200 GAL. SEPTIC TANK,  
CONNECT TO EX. BLDG.  
SEWER. CONSTRUCT TWO  
10'x25' TREATMENT BEDS  
WITHIN A SINGLE MOUND.

NOTES: CLEAR AND GRUB TREES AS  
NECESSARY.  
MINIMUM BOTTOM OF FILTER  
MATERIAL - ELEV. 936.0





# Custom Soil Resource Report Soil Map



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12D	Emmert gravelly loamy coarse sand, 15 to 25 percent slopes	0.2	20.3%
1033	Udifluvents	0.6	79.7%
<b>Totals for Area of Interest</b>		<b>0.8</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,



## Washington County, Minnesota

### 12D—Emmert gravelly loamy coarse sand, 15 to 25 percent slopes

#### Map Unit Setting

*National map unit symbol:* 1t939  
*Elevation:* 700 to 1,600 feet  
*Mean annual precipitation:* 28 to 36 inches  
*Mean annual air temperature:* 39 to 48 degrees F  
*Frost-free period:* 120 to 170 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Emmert and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Emmert

##### Setting

*Landform:* Pitted outwash plains  
*Landform position (two-dimensional):* Shoulder  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Outwash

##### Typical profile

*Ap - 0 to 6 inches:* loamy coarse sand  
*Bw,C - 6 to 60 inches:* extremely gravelly coarse sand

##### Properties and qualities

*Slope:* 15 to 25 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very high (19.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Very low (about 2.1 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A  
*Ecological site:* F090AY019WI - Dry Sandy Uplands  
*Forage suitability group:* Sandy (G090XN022MN)  
*Other vegetative classification:* Sandy (G090XN022MN)  
*Hydric soil rating:* No

#### Minor Components

##### Kingsley

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

**Chetek**

*Percent of map unit: 5 percent*

*Hydric soil rating: No*

**1033—Udifuvents**

**Map Unit Setting**

*National map unit symbol: 1t96x*

*Elevation: 670 to 1,070 feet*

*Mean annual precipitation: 28 to 36 inches*

*Mean annual air temperature: 39 to 48 degrees F*

*Frost-free period: 120 to 170 days*

*Farmland classification: Not prime farmland*

**Map Unit Composition**

*Udifuvents and similar soils: 90 percent*

*Minor components: 10 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Udifuvents**

**Setting**

*Landform: Shorelines*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Sandy beach sediments*

**Properties and qualities**

*Slope: 0 to 6 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Somewhat poorly drained*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

**Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 4w*

*Ecological site: F090AY009WI - Moist Sandy Lowland*

*Forage suitability group: Sloping Upland, Low AWC, Acid (G090XN008MN)*

*Other vegetative classification: Sloping Upland, Low AWC, Acid (G090XN008MN)*

*Hydric soil rating: No*

**Minor Components**

**Aquolls, ponded**

*Percent of map unit: 10 percent*

*Landform: Depressions on moraines*

*Down-slope shape: Concave*

*Across-slope shape: Concave*

## Custom Soil Resource Report

*Ecological site:* F090AY006WI - Wet Loamy Lowland

*Other vegetative classification:* Not Suited (G090XN024MN)

*Hydric soil rating:* Yes

# Custom Soil Resource Report

Septic Tank Absorption Fields (MN)—Washington County, Minnesota							
Map symbol and soil name	Pct. of map unit	Septic Tank Absorption Fields - At-Grade		Septic Tank Absorption Fields - Mound		Septic Tank Absorption Fields - Trench	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12D—Emmert gravelly loamy coarse sand, 15 to 25 percent slopes							
Emmert	90	Very limited		Extremely limited		Very limited	
		>= 35% Rock Frags	0.90	Slope	1.00	>= 35% Rock Frags	0.90
		Slope	0.73	>= 35% Rock Frags	0.90	Slope	0.73
						Excessive percolation	0.32
1033—Udifluvents							
Udifluvents	90	Not rated		Not rated		Not rated	

8286 Hidden Bay Ct N, Lake Elmo







Minnesota  
Department of  
Health

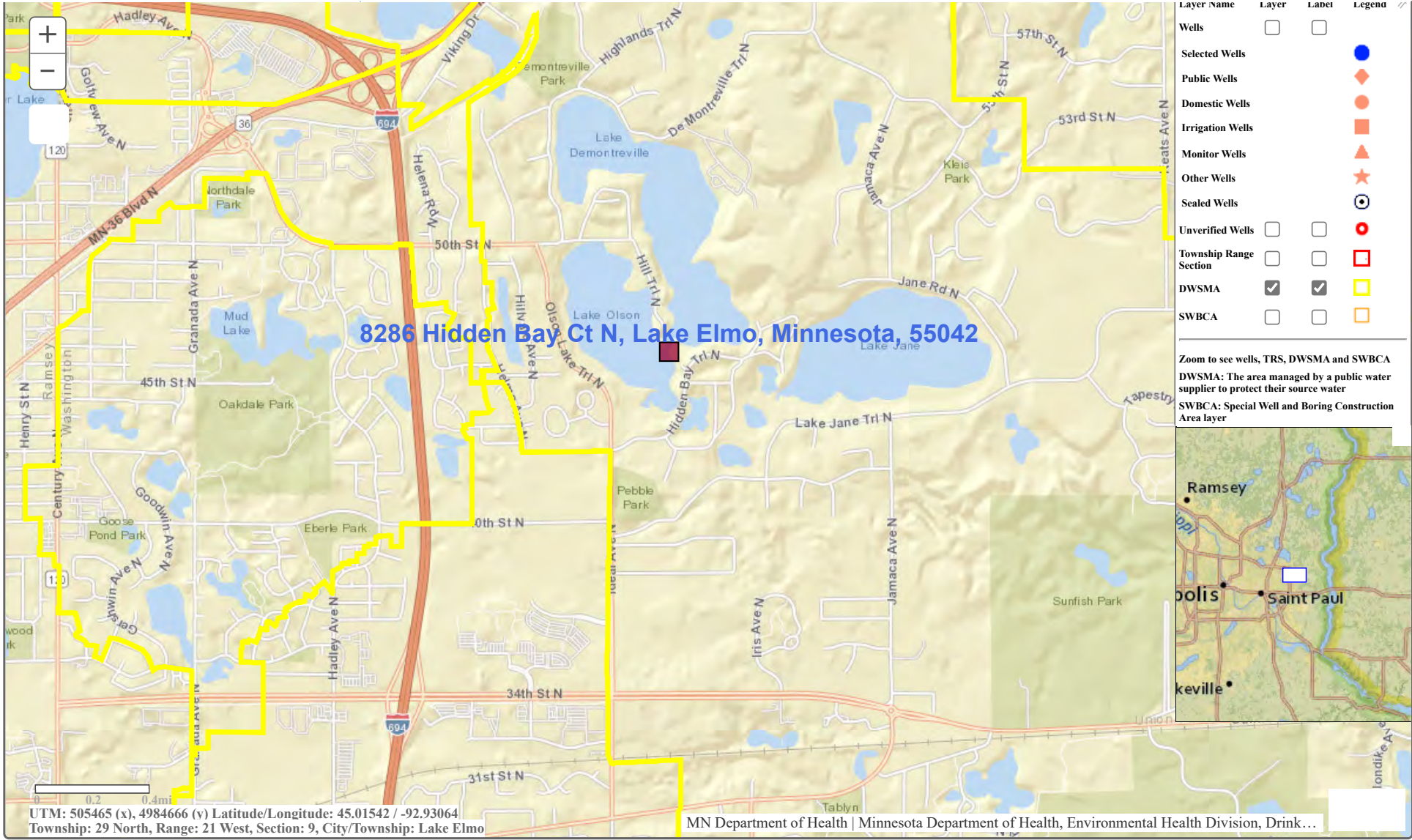
# Minnesota Well Index

Version 2.0.85, 11/19/21 3:34PM

8286 Hidden Bay Ct N, Lake Elmo, MN, 5504 X



Search by Zoom to Tools Base Maps Other Links Help







Minnesota  
Department of  
Health

# Minnesota Well Index

Version 2.0.85, 11/19/21 3:34PM

8286 Hidden Bay Ct N, Lake Elmo, MN, 5504

X

Q

Search by

Zoom to

Tools

Base Maps

Other Links

Help

+

-

0

150

300ft

UTM: 504836 (x), 4984775 (y) Latitude/Longitude: 45.01641 / -92.93862

Click map to get township, range and section

Layer name	Layer	Label	Legend
Wells	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Selected Wells			<span style="color: blue;">●</span>
Public Wells			<span style="color: orange;">◆</span>
Domestic Wells			<span style="color: orange;">●</span>
Irrigation Wells			<span style="color: orange;">■</span>
Monitor Wells			<span style="color: orange;">▲</span>
Other Wells			<span style="color: orange;">★</span>
Sealed Wells			<span style="color: blue;">⊙</span>
Unverified Wells	<input type="checkbox"/>	<input type="checkbox"/>	<span style="color: red;">●</span>
Township Range Section	<input type="checkbox"/>	<input type="checkbox"/>	<span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px;"></span>
DWSMA	<input type="checkbox"/>	<input type="checkbox"/>	<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>
SWBCA	<input type="checkbox"/>	<input type="checkbox"/>	<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>

Zoom to see wells, TRS, DWSMA and SWBCA

DWSMA: The area managed by a public water supplier to protect their source water

SWBCA: Special Well and Boring Construction Area layer

MN Department of Health | Minnesota Geological Survey, University of Minnesota and the Minneso...



# Subsurface Sewage Treatment Systems

Non-transferable

# Business License

Kloeppner Services & Designs LLC

License # L4043

License Expires: 4/1/2024

Issued: 4/7/2023

## Specialty Area(s):

Service Provider

Advanced Designer

Advanced Inspector

## Designated Certified Individual(s):

Cert #

C8188

Name

Jesse J Kloeppner

Certification Expires:

11/15/2026

Service Provider, Advanced Designer, Advanced Inspector



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

A handwritten signature in blue ink that reads 'Nick Haig'.

Nick Haig, Supervisor  
Certification and Training Unit

## Sophia Jensen

---

**From:** Jack Griffin <Jack.Griffin@focusengineeringinc.com>  
**Sent:** Tuesday, June 20, 2023 6:36 PM  
**To:** Sophia Jensen  
**Cc:** Chad Isakson  
**Subject:** 8286 Hidden Bay Trail

**Caution:** This email originated outside our organization; please use caution.

Sophia,

Engineering does not have any comments related to the 4 variance requests at 8286 Hidden Bay Trail. It appears the requested variances are essentially a continuation of existing non conforming conditions. The septic system design will need to meet the approvals of Washington County.

Thanks ~Jack

John (Jack) W. Griffin, P.E.  
Principal / Sr. Municipal Engineer

**FOCUS** ENGINEERING, INC.  
651.300.4264  
[jack.griffin@focusengineeringinc.com](mailto:jack.griffin@focusengineeringinc.com)

## Sophia Jensen

---

**From:** Dustin Kalis  
**Sent:** Thursday, June 22, 2023 1:41 PM  
**To:** Sophia Jensen  
**Subject:** RE: Lake Elmo Land Use Review - 8286 Hidden Bay Trl

The Lake Elmo Fire Department has the following comments:

**8286 Hidden Bay Trl Variance:** Building address numbers shall be plainly visible from the street fronting the property and shall contrasting color from the background. Addresses may be required to be posted adjacent to driveways or other access ways.



**Dustin Kalis | Fire Chief**

Lake Elmo Fire Department

Fire Station #1 - 3510 Laverne Ave N. | Lake Elmo, MN | 55042  
651-747-3933 *office* | [www.lakeelmo.org](http://www.lakeelmo.org)



## Sophia Jensen

---

**From:** John P. Hanson <JHanson@barr.com>  
**Sent:** Monday, June 26, 2023 8:39 AM  
**To:** Sophia Jensen  
**Cc:** Scollan, Daniel (DNR)  
**Subject:** RE: Lake Elmo Land Use Review - June 1st Batch

**Caution:** This email originated outside our organization; please use caution.

Sophia-

- The proposed home at 8286 Hidden Bay Court North needs to be raised. The VBWD-established 100-year flood level of Olson Lake is 931.8 (NAVD88) and the lowest floor needs to be at least 2 feet higher.
- Less than 6,000 square feet of new and fully reconstructed impervious surface is proposed so permanent stormwater management isn't required, but it's still encouraged.
- A minimum 35-foot-wide buffer strip measured perpendicular to the OHW extending 35 feet inland shall be provided. A mowed access path and shoreline are allowed but must not exceed 30% of the landowner's shoreline width or 30 feet, whichever is less. For shorelines less than 20 feet wide, a 6-foot-wide access path is allowed. Access paths shall not be located where concentrated runoff will flow to the lake. Buffer vegetation shall not be cultivated, cropped, pastured, mowed, fertilized, subject to the placement of mulch, yard waste, or snow piles, or otherwise disturbed, except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, mowing for purposes of public safety, temporary disturbance for placement or repair of buried utilities, or other actions to maintain or improve buffer quality, each as approved by the VBWD or when implemented pursuant to a written agreement executed with the VBWD. No new structure or impervious surface shall be placed within a buffer.
- Temporary erosion controls need to be installed and maintained between the proposed grading and the lake.

John

John P. Hanson, PE  
Valley Branch Watershed District Engineer  
Barr Engineering Co. | 4300 MarketPointe Drive | Bloomington, MN 55435  
office: 952.832.2622 | cell: 612.590.1785  
[JHanson@barr.com](mailto:JHanson@barr.com) | [www.barr.com](http://www.barr.com) | [www.vbwd.org](http://www.vbwd.org)

resourceful. naturally.



## Sophia Jensen

---

**From:** Scollan, Daniel (DNR) <daniel.scollan@state.mn.us>  
**Sent:** Friday, June 30, 2023 10:25 AM  
**To:** Sophia Jensen  
**Cc:** John P. Hanson  
**Subject:** RE: Lake Elmo Land Use Review - June 1st Batch

**Caution:** This email originated outside our organization; please use caution.

Hello Sophia:

- The application proposes removal of numerous trees located between the principal structure and Lake Olson. These trees provide important shoreland habitat and provide screening of structures as viewed from the water. If the City determines that the variance criteria have been met, DNR recommends the city require a tree replacement plan as a condition of approval.
- The proposed increase of impervious surface from existing conditions, 4,754 SF (18.3%) to proposed conditions, 5,649 SF (21.8%), should be carefully scrutinized. The application, for example, does not explain why the driveway area needs to be expanded from the existing condition of 1775 SF to 1941 SF to provide for adequate ingress/egress. We recommend requiring the applicant to maintain the existing footprint of the driveway.

Best Regards,

**Dan Scollan**

East Metro Area Hydrologist – Ramsey and Washington Counties  
Division of Ecological and Water Resources

**Minnesota Department of Natural Resources**

1200 Warner Road

St. Paul, MN 55106

Phone: 651-259-5732

Fax: 651-772-7977

Email: [daniel.scollan@state.mn.us](mailto:daniel.scollan@state.mn.us)  
[mndnr.gov](http://mndnr.gov)



---

**From:** Sophia Jensen <SJensen@lakeelmo.org>  
**Sent:** Thursday, June 29, 2023 7:24 AM  
**To:** Scollan, Daniel (DNR) <daniel.scollan@state.mn.us>  
**Subject:** RE: Lake Elmo Land Use Review - June 1st Batch

Link Lavey  
8510 Hidden Bay Trl N  
Lake Elmo, MN 55042  
July 11th, 2023

Sophia Jensen  
City Planner  
City of Lake Elmo  
3800 Laverne Ave N  
Lake Elmo, MN 55042

Dear Sophia Jensen:

Thank you for taking the time to meet with me today. As mentioned in our conversation I have been the President of the Lake Demontreville and Olson Association (LDO) for the past six years, and am also member of the VBWD Citizen Advisory Committee. The LDO is focused on the health of lakes Demontreville and Olson. We spend approximately \$40,000 annually fighting invasive species and controlling algae. Additionally, we take water samples for the Met Council, sponsor educational programs, lake clean up days and work with other local partners. These efforts are so everyone can enjoy these great resources we have here in Lake Elmo.

The variance requests for the property located at 8286 Hidden Bay CT are very concerning. The property is already noncompliant with existing building codes in its current location. Any variances could have a further negative impact on surface and subsurface (septic) drainage into the lakes. Either of these would add additional unwanted nutrients into the lakes and upset the balance we are working very hard to manage.

I do realize that not all properties are able to meet all city building codes. However, I do ask that any deviation from current codes please consider the potential environmental impact to a recreational resource shared and enjoyed by many.

Sincerely,

Link Lavey

## Sophia Jensen

---

**From:** Charles Cadenhead  
**Sent:** Tuesday, July 11, 2023 10:01 AM  
**To:** Sophia Jensen  
**Cc:** kyle.risner@gmail.com  
**Subject:** 8286 Hidden Bay Ct - Variance Request

Sophia,

I need to pass along some information that came from a resident, but they wish to not be named.

They would like to be assured that the committee is aware of the DNR and the VBWSD comments.

They are opposed to Variance 1: "They are requesting to be 10.4 feet closer to the OHWM. Part of the LDO (Lake Demontreville/Olson) management program is to maintain and protect these precious natural resources and this cannot be done if we continue to encroach on the OHWM.

They are opposed to Variance 2: They do not believe in increasing impervious surface coverage for one self, and then put it in writing as to a "safe egress for adjoining their property". They believe that it is just for a fancy driveway entrance and that it would be out of character for the neighborhood. They say, "City code is 15%, stick to it. They just want a bigger footprint."

They are opposed to Variance 3: "They may not have done their homework nor due diligence when they bought this property and bought it as is. That does not give them an excuse to put a septic system dangerously closer to the water, there are other pump out options. They are requesting it to be 13 feet closer than the existing one.

We as neighbors are most concerned about our lakes. Building a home and septic system closer to the lake doesn't make sense. Increasing impervious surfaces, ignoring proper drainage, catch basins and removing large established trees all adds to the degradation of our lakes.

We believe that the Otto's current application should not be recommended as presented and our concerns must be addressed in any future plans.

Thank you for any and all consideration to this matter."

That's their letter in a nutshell. Please let me know if you have any questions.

Charles Cadenhead, Jr.  
City of Lake Elmo, Mayor  
phone: 651.300.9641

July 13, 2023

Dawn Goracki  
2620 5<sup>th</sup> Ave E  
North St Paul, MN 55109

Sophia Jensen  
City Planner  
City of Lake Elmo  
3800 Laverne Ave N  
Lake Elmo, MN 55042

Dear Sophia Jensen,

In response to the Notice of Public Hearing regarding the property at 8286 Hidden Bay Ct., I'd like to make the following comments:

**Variance 1** – Reduced structure setback from ordinary high-water level. I have no comment regarding this variance.

**Variance 2** – Reduced septic setback from ordinary high-water level. As a lake property owner, one of the biggest issues we've been dealing with is the weeds/algae growth on our lakes. Therefore, I am concerned that by moving a septic system closer to the water will exacerbate the weed/algae situation.

In this regard, I believe this decision should be based on recommendations by the experts at VBWSD & the DNR.

**Variance 3** – Increase in impervious surface for unsewered shoreland lots. The proposed re-landscaping on the NW side of the property creates a slope going toward the neighboring property which is also slightly higher at that point, forming a channel that I presume will funnel any run off right into the lake. Based on the drawing, it appears that area will be all grass, which will require maintenance that will almost certainly cause nutrients to flow freely into the lake. The proposed removal of many established trees is another factor in more run off to the lake.

Thank you for considering our concerns.

Sincerely,

Dawn Goracki



## Sophia Jensen

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**From:** Douglas Huntley <dahuntley1@gmail.com>  
**Sent:** Friday, July 21, 2023 9:03 PM  
**To:** Sophia Jensen  
**Subject:** written input for proposed variances related to 8286 Hidden Bay Ct N

You don't often get email from dahuntley1@gmail.com. [Learn why this is important](#)

**Caution:** This email originated outside our organization; please use caution.

Sophia,

My wife and I are next door neighbors to the Ottos as we have lived at 8290 Hidden Bay Court North for the last 7 years. Jeff and Judy kindly showed the plans for their new home to us and we voiced two concerns with them that they stated they would address with their architect. As we have not seen any plan changes, we wish to also reach out to you in order to follow the prescribed process to provide input.

The first concern has to do with the elevation change needed to build up what currently is their basement garage into a first floor entrance. We believe that this elevated and sloped road surface would magnify the amount of rainwater and runoff that naturally occurs today into the back NW part of our property, especially if the road surface is impervious. Today there is an area that collects with water during heavy rains but it drains after a reasonable time. We believe this could become a much bigger issue if the current plan is allowed to proceed.

Our second concern is that there appears to be no clear way to handle snow in the current design. We want to make sure that excess snow is not simply moved onto our property and that there is a plan in place to manage.

We very much appreciate having the Ottos as neighbors and hope that you will be able to work with them to come to a reasonable solution while still respecting the precedence that will be set with any variances.

Kind regards,

Doug and Pam Huntley  
(651) 334-0524