

Minnesota Pollution Control Agency

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

# Compliance Inspection Form

## Existing Subsurface Sewage Treatment Systems (SSTS)

Doc Type: Compliance and Enforcement

**Instructions:** Inspection results based on Minnesota Pollution Control Agency (MPCA) requirements and attached forms – additional local requirements may also apply.

For local tracking purposes:

Submit completed form to Local Unit of Government (LUG) and system owner within 15 days

### System Status

System status on date (mm/dd/yyyy): \_\_\_\_\_

**Compliant – Certificate of Compliance**

(Valid for 3 years from report date, unless shorter time frame outlined in Local Ordinance.)

**Noncompliant – Notice of Noncompliance**

(See Upgrade Requirements on page 3)

#### Reason(s) for noncompliance (check all applicable)

- Impact on Public Health (Compliance Component #1) – Imminent threat to public health and safety
- Other Compliance Conditions (Compliance Component #3) – Imminent threat to public health and safety
- Tank Integrity (Compliance Component #2) – Failing to protect groundwater
- Other Compliance Conditions (Compliance Component #3) – Failing to protect groundwater
- Soil Separation (Compliance Component #4) – Failing to protect groundwater
- Operating permit/monitoring plan requirements (Compliance Component #5) – Noncompliant

### Property Information

Parcel ID# or Sec/Twp/Range: \_\_\_\_\_

Property address: \_\_\_\_\_ Reason for inspection: \_\_\_\_\_

Property owner: \_\_\_\_\_ Owner's phone: \_\_\_\_\_

or

Owner's representative: \_\_\_\_\_ Representative phone: \_\_\_\_\_

Local regulatory authority: \_\_\_\_\_ Regulatory authority phone: \_\_\_\_\_

Brief system description: \_\_\_\_\_

Comments or recommendations: \_\_\_\_\_

### Certification

I hereby certify that all the necessary information has been gathered to determine the compliance status of this system. No determination of future system performance has been nor can be made due to unknown conditions during system construction, possible abuse of the system, inadequate maintenance, or future water usage.

Inspector name: Dennis Schlomka Certification number: 545

Business name: D. Schlomka, Inc License number: 1106

Inspector signature: *Dennis Schlomka* Phone number: 320-384-7911

### Necessary or Locally Required Attachments

- Soil boring logs
- System/As-built drawing
- Forms per local ordinance
- Other information (list): \_\_\_\_\_

**1. Impact on Public Health – Compliance component #1 of 5**

**Compliance criteria:**

System discharge sewage to the ground surface.	<input type="checkbox"/> Yes <input type="checkbox"/> No
System discharge sewage to drain tile or surface waters.	<input type="checkbox"/> Yes <input type="checkbox"/> No
System cause sewage backup into dwelling or establishment.	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Any "yes" answer above indicates the system is an Imminent Threat to Public Health and Safety.**

Comments/Explanation:

**Verification method(s):**

- Searched for surface outlet
- Searched for seeping in yard/backup in home
- Excessive ponding in soil system/D-boxes
- Homeowner testimony (See Comments/Explanation)
- "Black soil" above soil dispersal system
- System requires "emergency" pumping
- Performed dye test
- Unable to verify (See Comments/Explanation)
- Other methods not listed (See Comments/Explanation)

**2. Tank Integrity – Compliance component #2 of 5**

**Compliance criteria:**

System consists of a seepage pit, cesspool, drywell, or leaching pit. <i>Seepage pits meeting 7080.2550 may be compliant if allowed in local ordinance.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sewage tank(s) leak below their designed operating depth.	<input type="checkbox"/> Yes <input type="checkbox"/> No
If yes, which sewage tank(s) leaks:	

**Any "yes" answer above indicates the system is Failing to Protect Groundwater.**

Comments/Explanation:

**Verification method(s):**

- Probed tank(s) bottom
- Examined construction records
- Examined Tank Integrity Form (Attach)
- Observed liquid level below operating depth
- Examined empty (pumped) tanks(s)
- Probed outside tank(s) for "black soil"
- Unable to verify (See Comments/Explanation)
- Other methods not listed (See Comments/Explanation)

**3. Other Compliance Conditions – Compliance component #3 of 5**

- a. Maintenance hole covers are damaged, cracked, unsecured, or appear to structurally unsound.  Yes\*  No  Unknown
- b. Other issues (electrical hazards, etc.) to immediately and adversely impact public health or safety.  Yes\*  No  Unknown  
**\*System is an imminent threat to public health and safety**

Explain:

- c. System is non-protective of ground water for other conditions as determined by inspector  Yes\*  No  
**\*System is failing to protect groundwater**

Explain:

**4. Soil Separation – Compliance component #4 of 5**

Date of installation: \_\_\_\_\_  Unknown  
 Shoreland/Wellhead protection/Food Beverage Lodging?  Yes  No

**Verification method(s):**

*Soil observation does not expire. Previous soil observations by two independent parties are sufficient, unless site conditions have been altered or local requirements differ.*

- Conducted soil observation(s) (Attach boring logs)
- Two previous verifications (Attach boring logs)
- Not applicable (Holding tank(s), no drainfield)
- Unable to verify (See Comments/Explanation)
- Other (See Comments/Explanation)

**Compliance criteria:**

<p><i>For systems built prior to April 1, 1996, and not located in Shoreland or Wellhead Protection Area or not serving a food, beverage or lodging establishment:</i></p> <p>Drainfield has at least a two-foot vertical separation distance from periodically saturated soil or bedrock.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p><i>Non-performance systems built April 1, 1996, or later or for non-performance systems located in Shoreland or Wellhead Protection Areas or serving a food, beverage, or lodging establishment:</i></p> <p>Drainfield has a three-foot vertical separation distance from periodically saturated soil or bedrock.*</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<p><i>"Experimental", "Other", or "Performance" systems built under pre-2008 Rules; Type IV or V systems built under 2008 Rules (7080, 2350 or 7080.2400 (Advanced Inspector License required)</i></p> <p>Drainfield meets the designed vertical separation distance from periodically saturated soil or bedrock.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No

Comments/Explanation:

**Indicate depths of elevations**

A. Bottom of distribution media	
B. Periodically saturated soil/bedrock	
C. System separation	
D. Required compliance separation*	

\*May be reduced up to 15 percent if allowed by Local Ordinance.

**Any "no" answer above indicates the system is Failing to Protect Groundwater.**

**5. Operating Permit and Nitrogen BMP\* – Compliance component #5 of 5  Not applicable**

Is the system operated under an Operating Permit?  Yes  No **If "yes", A below is required**

Is the system required to employ a Nitrogen BMP?  Yes  No **If "yes", B below is required**

*BMP=Best Management Practice(s) specified in the system design*

**If the answer to both questions is "no", this section does not need to be completed.**

**Compliance criteria**

a. Operating Permit number: _____ Have the Operating Permit requirements been met?	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Is the required nitrogen BMP in place and properly functioning?	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Any "no" answer indicates Noncompliance.**

**Upgrade Requirements (Minn. Stat. § 115.55)** *An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance. If the system is failing to protect ground water, the system must be upgraded, replaced, or its use discontinued within the time required by local ordinance. If an existing system is not failing as defined in law, and has at least two feet of design soil separation, then the system need not be upgraded, repaired, replaced, or its use discontinued, notwithstanding any local ordinance that is more strict. This provision does not apply to systems in shoreland areas, Wellhead Protection Areas, or those used in connection with food, beverage, and lodging establishments as defined in law.*

# ZONING PERMIT APPLICATION

FULL NAME Donald Cunningham <sup>USI-</sup> TELE # 462-1424  
 BIRTHDATE & DL # 8-17-62 MND# C-552-149-051-643  
 MAIL ADDRESS 33550 Elm Ave Stacy MN 55079  
 911 ADDRESS Sent to GIS  
 TOWNSHIP Wagner  
 LEGAL DESCRIPTION 1072 BIK 3: Und 1/4 Lot 1004 Lot A  
 SECTION 26 TOWNSHIP 43 RANGE R1004 22

OFFICE USE ONLY	
DATE <u>5-22-03</u>	APPROVE / DENY <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">OK</span>
PERMIT# <u>30409</u>	
PARCEL# <u>3A-1-082600</u>	
RECEIPT# <u>51637</u>	
CONFORMING SEPTIC	
YES P#	NO <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">NEW</span>

(circle) RESIDENTIAL    COMMERCIAL    ACCESSORY    NEW BUILDING    ALTERATION

BUILDING CONTRACTOR AND LICENSE NUMBER: \_\_\_\_\_  
 SIZE OF ALL BUILDINGS COVERED BY THIS APPLICATION 28 x 22 Det Garage

10 x 28 Deck  
10 x 44 Deck  
28 x 28 addition to cabin (2 story)  
 COMMENTS: will remain a 2 bdrm - Mound Septic System at-grade

DATA FOR SEWER CONSTRUCTION: DESIGNER Wayne Andersen INSTALLER Roger Riewer #BEDROOMS/GPD 2/300

**DO NOT WRITE BELOW THIS LINE**

**ZONING DISTRICT & FLOOD PLAIN**

ZONING DISTRICT S/L  
 LAKE/STREAM/RIVER NAME Pine  
 LAKE/RIVER ID NUMBER 1-0001  
 LAKE/RIVER/STREAM CLASSIF. R/D  
 PARCEL LOCATED IN FLOOD PLAIN? Y  N   
 10/100 YR FLOOD ELEVATION \_\_\_\_\_  
 LOWEST FLOOR ELEVATION \_\_\_\_\_  
 ELEV. CERTIFICATE REQUIRED Y  N   
 BEFORE CONSTRUCTION Y  N   
 AFTER CONSTRUCTION Y  N

**STRUCTURE SETBACK DISTANCE REQUIREMENTS**

(Measure from eaves or overhang)

OHW TO LAKE/RIVER/STREAM 100'  
 PROPERTY LINE SETBACK 10'  
 SETBACK TO ROAD R-O-W 30' township 50' County  
 SETBACK TO BLUFF 30'

**SEPTIC SYSTEM SETBACK DISTANCES**

SETBACK TO STRUCTURES 10' tank 20' den/ded  
 OHW TO LAKE/RIVER 75'  
 PROPERTY LINE SETBACK 10'  
 SETBACK TO ROAD R-O-W 10'

**\*\*ATTACH COPY OF ELEVATION CERTIFICATES\*\***

SOIL BORINGS 6 SEPTIC DESIGN Mound At Grade GARBAGE DISP/HOT TUB YES  NO   
 PERK RATES \_\_\_\_\_ DEPTH TO RESTRICTING LAYER 3ft  
 MIN. SIZE SEPTIC TANK 1000 MIN. SIZE PUMP TANK 500  
 DRAINFIELD: MINIMUM SQ.FT \_\_\_\_\_ WITH \_\_\_\_\_ INCHES ROCK BELOW PIPE  
 MOUND: MINIMUM ROCK BED SQ.FT 424 WITH 9 INCHES ROCK BELOW PIPE  
 MIN. UPSLOPE SAND WIDTH 6.7 MIN. DOWNSLOPE SAND WIDTH 13.9 END SAND WIDTHS 6.7  
 RECOMMENDATIONS: \_\_\_\_\_

X [Signature] \$ 250.00 Julie 5-20-03  
 SIGNATURE APPLICANT/AGENT FEE RECEIVED BY DATE

EXPIRES IN ONE YEAR

Aitkin County Zoning, Courthouse — AITKIN, MINNESOTA 56431 — Telephone 218/927-7342

FIELD EVALUATION SHEET

5-20-03

NAME Don Cunningham PERMIT # 30409  
 PARCEL # 34-1-082000 TWP 43 SECTION 24

CHECK THE FOLLOWING PRIOR TO INSPECTION

\_\_\_\_\_  
 \_\_\_\_\_ NAME OF SITE EVALUATOR  
 \_\_\_\_\_ NAME OF DESIGNER  
 \_\_\_\_\_ NAME OF INSTALLER

\_\_\_\_\_  
 \_\_\_\_\_ LOT OF RECORD BEFORE 1-21-92 (SL) IR 1-10-95 (NSL), IF NO, ALT. SITE? \_\_\_\_\_  
 \_\_\_\_\_ SITE PLAN WITH SETBACK DISTANCES AND DIMENSIONS  
 \_\_\_\_\_ ARE ISTS SITES PROTECTED FROM DAMAGE? IF NOT, WHEN \_\_\_\_\_  
 \_\_\_\_\_ DESIGN \_\_\_\_\_ PERC TESTS \_\_\_\_\_ SOIL BORINGS, 2 PER SITE  
 \_\_\_\_\_ NUMBER OF BEDROOMS (INCLUDE POTENTIAL)  
 \_\_\_\_\_ CROSS SECTION SHEET \_\_\_\_\_ TRENCH DESIGN SHEET  
 \_\_\_\_\_ MOUND DESIGN SHEET \_\_\_\_\_ OTHER OR PERFORM.  
 \_\_\_\_\_ PRESSURE DISTRIBUTION SHEET \_\_\_\_\_ PUMP CALC. TEST  
 \_\_\_\_\_ WATER USE CALCULATIONS \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_ GARBAGE DISPOSAL \_\_\_\_\_ HOT TUB  
 \_\_\_\_\_ EASEMENTS ON LOT, IS ROAD PUBLIC OR PRIVATE SEE DEED/PLAT  
 \_\_\_\_\_ NATURAL LANDSCAPE PROTECTION PLAN

STAKING: BUILDINGS X, DRAINFIELD X, BORINGS X, WELL X  
 BUILDING SETBACKS: ROAD \_\_\_\_\_, SIDE \_\_\_\_\_, REAR \_\_\_\_\_, BLUFF \_\_\_\_\_  
 LAKE/RIVER \_\_\_\_\_

COMPLETE DURING SITE EVALUATION  
 \_\_\_\_\_ BUILDINGS STAKED \_\_\_\_\_ DRAINFIELD STAKED \_\_\_\_\_ BORINGS STAKED  
 \_\_\_\_\_ WELL STAKED

SETBACKS (MEASURE DISTANCE)

	<u>DRAINFIELD</u>	<u>HOUSE</u>
FLOOD PLAIN	YES/NO	YES/NO
WETLANDS	YES/NO	YES/NO
LAKE, RIVER, PROTECTED WATERS	<u>&gt; 10'</u>	<u>&gt; 100'</u>
ROAD RIGHT OF WAY	<u>&gt; 30'</u>	<u>&gt; 50'</u>
BLUFF	<u>NO</u>	<u>NO</u>
SIDE LOT LINE	<u>10'</u>	<u>10'</u>
REAR LOT LINE	<u>OK</u>	<u>OK</u>
HOUSE OR OTHER STRUCTURE	<u>&gt; 20' TRK 20' DIST</u>	_____
WELL	<u>NONE</u>	<u>NONE</u>
EASEMENTS	_____	_____
NEIGHBORING WELL (S) TO ISTS	(1) <u>\</u> (2) _____	(3) <u>\</u> (4) _____
DRAINFIELD AREA DISTURBED	_____	_____

CONFORMING SEPTIC SYSTEM: \_\_\_\_\_ YES X NO If no, list reasons below.  
 COMMENTS OR PROBLEMS (drainage, swales, wetlands, need gutters, etc.) TO BE INSTALLED

APPROVED: (Signature) YES OR NO

INSPECTORS NAME M. Keller DATE 5-22-03 # PICTURES \_\_\_\_\_

SOIL BORING LOGS AND SKETCH PLAN ON REVERSE SIDE

**C. Directions to your Property (required):**

From a major intersection:

3522P 47 to CO Rd 18 EAST

go past pine lake 1st Rd on Rt Follow

Road Along lake to Y in Road go left turn to

Dirt Follow Around to lake 116th 1st Rd on Rt

down 1/2 mile Turn past prefab Home with Gage yellow.

*1st driveway on left*

**D. NATURAL LANDSCAPE PROTECTION PLAN:**

Complete this section only if you were directed to in Section A OR if you are working near a lake or stream.

1. Description of proposed construction: 28x28 Addition 2 story 22x28 Gage  
44x10 Deck on Front 10x28 Deck on Back

2. Existing vegetative cover (e.g., forested, grass, shrub, lawn, etc.)? NO

3. Setback from the Ordinary High Water Level (OHW) for proposed construction? 100ft

4. How much excavation or fill work is being done inside the Shore Impact Zone (SIZ)? None  
(If excavation or fill work greater than 10 cu yds is being done, supply copy of Site review from SWCD)  
(The SIZ: Mississippi River & NE Lakes = 75 feet, RD & GD lakes = 50 feet, other waters-see ordinance)

5. How much excavation or fill work is being done outside the Shore Impact Zone (SIZ)? 49 yds  
(If excavation or fill work greater than 50 cu yds is being done, supply copy of Site review from SWCD)

6. What percent slope of the land currently exists on the construction site? 2-3%  
(If the percent slope is greater than 20%, supply copy of Site review from SWCD)

7. How much clearing of trees and shrubs will be done inside the Shore Impact Zone (SIZ)? None  
(If vegetation will be cleared in the SIZ, supply copy of Site review from SWCD)

8. How will erosion be controlled during construction? NO EROSION

9. What will be done after construction to control erosion? plant Grass shrubs  
Geotextiles?

I have read the above and I understand the Natural Landscape Protection Plan as prepared. I hereby agree to implement this plan as part of the Land Use Permit.

X [Signature] 5-2003  
Landowner Signature Date

[Signature] 5-2003  
Zoning Official Date

# SUPPLEMENTAL DATA FOR LAND USE PERMITS

Page 1 of 2

\*\*\* COMPLETE BOTH SIDES \*\*\*

## A. PLANNING CHECKLIST (required):

- |   | YES                                 | NO                                  | ???                      |
|---|-------------------------------------|-------------------------------------|--------------------------|
| 1. Are you aware of setback requirements and will your project meet them? <i>Note: Setback distances are taken from ..... any projection of the building (i.e. overhangs, eaves, decks, etc.)</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| 2. Have you taken in consideration locations for future buildings, septic systems, decks, driveways, etc? .....   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| 3. Are there any lowlands or wetlands on or near the site project? .....  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Is there a steep slope or bluff on or near the site? .....<br>(If yes, complete Section D)   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Will the project involve the clearing of trees or shrubs within the Shore Impact Zone of a lake or river? (If yes, complete Section D) ...   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Will the project involve grading, filling or landscaping within the shoreland district of a lake or river? (If yes, complete Section D).....   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Is your property in a floodplain? .....  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
- If it is, the lowest floor (which includes basement or crawl space, regardless of a dirt floor) must be one foot (1') above the 100-year flood elevation. A benchmark established by a registered surveyor or licensed engineer may be required before granting a land use permit.*

## B. PRE-EVALUATION INSPECTION REQUEST (required):

Defining and staking the property lines, road right-of-ways, septic sites, and wells are the responsibility of the property owner. In some cases, a registered survey may be required to verify setbacks before granting a permit.

**ALL PROPOSED DEVELOPMENT REQUESTS MUST BE CLEARLY STAKED AT ALL FOUR CORNERS IF APPLICABLE, IF STAKES ARE NOT PRESENT OR VISIBLE IT MAY RESULT IN ADDITIONAL FEES OR A DELAY IN THE PERMIT PROCESS.**

The undersigned hereby makes application for a pre-evaluation permit inspection, agreeing that all setback information and delineation of property lines, well location, road setbacks, and development corners have been properly marked in accordance with the standards and requirements of the Aitkin County Ordinances.

Telephone Number between the hours of 8:00 A.M. and 4:00 P.M. 763-780-3142

Landowner: Donald Cunningham Date: 5-20-03

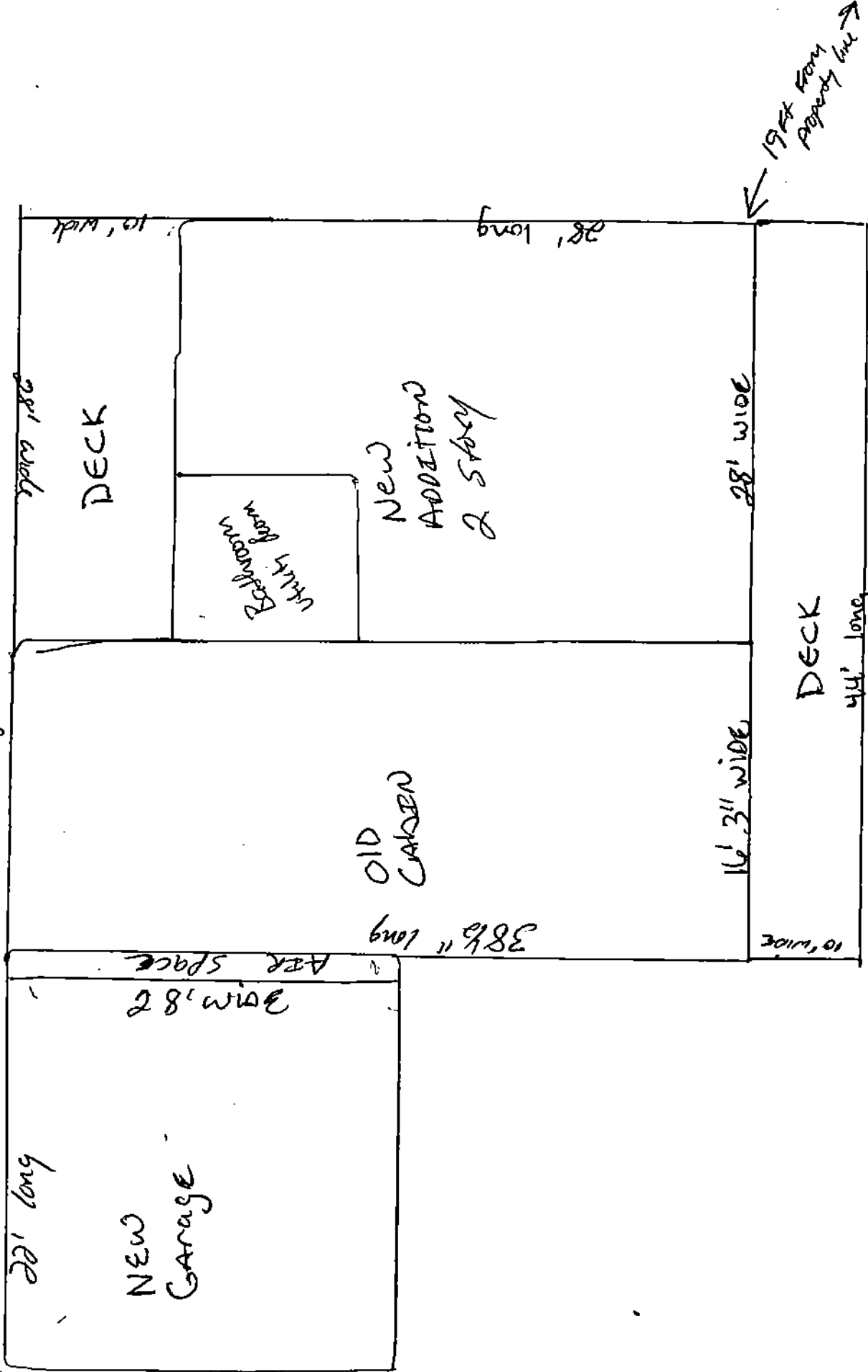
Address: 33550 Elm Ave

Stacy Munnis

LANDOWNER SIGNATURE: X [Signature]

If you have any questions please contact the Planning and Zoning office at (218) 927-7342  
Ordinances and Publications are available **FREE** online at: [www.co.aitkin.mn.us](http://www.co.aitkin.mn.us)

WE LOOK FORWARD TO WORKING WITH YOU



200 FT

19' 4" from property line

110th lane





## Anderson Connections

Septic Design & Inspection

Invoice: 2418

~~October 21, 2002~~  
May 16, 2023

Donald Cunningham  
33550 Elmo Ave  
Stacy, MN 55079

Dear Mr. Cunningham:

I have completed the Septic design for your cabin/home site located in part of the Northwest Quarter of the Southeast Quarter, Section 26, Wagner Township, Aitkin County. I have sized the system for a two-bedroom home with two or more water-using appliances, but no garbage disposal. The soil treatment area will utilize an at-grade pressure distribution system. The septic tank will be a 1500 gallon combination tank. This will provide a 1000 gallon septic tank and a 500 gallon lift station to deliver liquid effluent to the treatment area. The pump required for this system must be able to deliver 20 gpm and provide at least 14 feet of head. This septic system is designed for the septic waste from the home. Clean water from footing drains or a sump pit must not enter this system.

Please review the flags I have placed on your property. The flags indicate the tank and soil treatment locations. I request that the property lines be verified to be more than ten feet from these flags.

Remember that homeowners are responsible for management of their septic system. Please take the time to read the "Homeowner's Manual" that I am including with your design. The manual includes many helpful hints for managing your new septic system. I thank you for your business, and I am sure you will be pleased with your new septic system.

Sincerely,

Wayne H. Anderson  
License # 1298

en: Homeowner's copy  
Contractor's copy  
Permitting agency copy

reviewed 5/20/03 KJ

# ATGRADE DESIGN WORKSHEET

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60% of the values in the Class I, II, or III columns.
3	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

All boxed rectangles must be entered, the rest will be calculated.

## A. Average Design Flow

Estimated 300 gpd (see figure A-1)  
 or measured = measured amount x 1.5(safety factor) = 0 gpd x 1.5 = 0 gpd

## B. Septic Tank Capacity

1000 gallons (see figure C-1)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
2 or less	750	1125	1500
3 or 4	1000	1500	2000
5 or 6	1500	2250	3000
7, 8 or 9	2000	3000	4000

## C. Soils (refer to site evaluation)

1. Depth to restricting layer = 3 ft  
 2. Depth of percolation tests =          ft  
 3. Texture sandy loam Percolation Rate          mpi  
 4. Soil Sizing Factor (SSF) 1.27 ft<sup>2</sup>/gpd (see figure D-15)  
 5. Linear Loading Rate (LLR) 7 gpd/ft (see figure D-42)  
 6. Land Slope 5 %

Percolation Rate (mpi)	Soil Texture (D-15)	Other Characteristics in Upper 48"	Linear Loading Rate - LLR (gpd/ft)
Faster than 0.1"	Coarse Sand	No structural change Layers of other textures	6
		Saturated soil (> 3") Bedrock	5
0.1 to 0.5"	Sand Loamy Sand Fine Sand	No structural change Layers of other textures	8
		Layers or Bedrock	4
0.5 to 1.5"	Sandy Loam	Saturated soil (> 3") Bedrock	5
		Structural change Structure	7
1.5 to 4.0"	Sandy Loam	No structural change Condition II	5
		Condition III	4
4.0 to 6.0"	Loam Silt Loam Silty Clay Loam Clay Loam	Structural change Structure	6
		No structural change Condition II	5
6.0 to 12.0"	Clay Sandy Clay Silty Clay	Condition III	4
		Structural or moisture structure No structural change Condition II	3
Slower than 120"	Clay Sandy Clay Silty Clay	Condition II	2
		Condition III	2

## D. Rock Width

1. Rock absorption width equals LLR(C5) times SSF(C4) =  
7 gpd/ft x 1.27 ft<sup>2</sup>/gpd = 8.9 ft

## E. System Size

1. The height of the system 2 feet  
 2. Determine upslope width  
 a. Upslope multiplier based on percent land slope (see figure D-46)

3.33

b. Upslope width = upslope multiplier(E2a) times system height (E1)  
3.33 ft x 2 ft = 6.66 ft

3. Determine downslope width 5

a. Downslope multiplier based on percent land slope (see figure D-46)

b. Downslope width = upslope multiplier(E3a) times system height (E1)  
5 ft x 2 ft = 10.0 ft

c. Rock absorption width (D1) + 5 feet 8.9 + 5ft 13.9 ft

d. Downslope width equals the larger of 3b and 3c 13.9 ft

4. System width is the sum of upslope width(E2b) plus downslope width(E3d)

6.66 ft + 13.9 ft = 20.6 ft

5. The rock layer length is the flow (A) divided by the LLR(C5)

300 gpd / 7 gpd/ft = 42.9 ft

6. Total length is the sum of upslope width(E2b), rock layer length(E5) and upslope width (E2b)

6.7 ft + 42.9 ft + 6.7 ft = 56.2 ft

## F. Rock Volume

1. Rock Area = Length(E5) x Width(D1+ 1ft)  
42.9 ft x (8.9 ft + 1ft) = 423.9 ft<sup>2</sup>

2. Multiply rock area(F1) by depth of rock(1ft) and divide by 2 because the shape is triangular

423.9 ft<sup>2</sup> x 1ft / 2 = 211.9 ft<sup>2</sup>

3. Volume in cubic yards = volume in cubic feet divided by 27

F2/ 27 = cubic yards 211.9 / 27 = 7.8 yd<sup>3</sup>

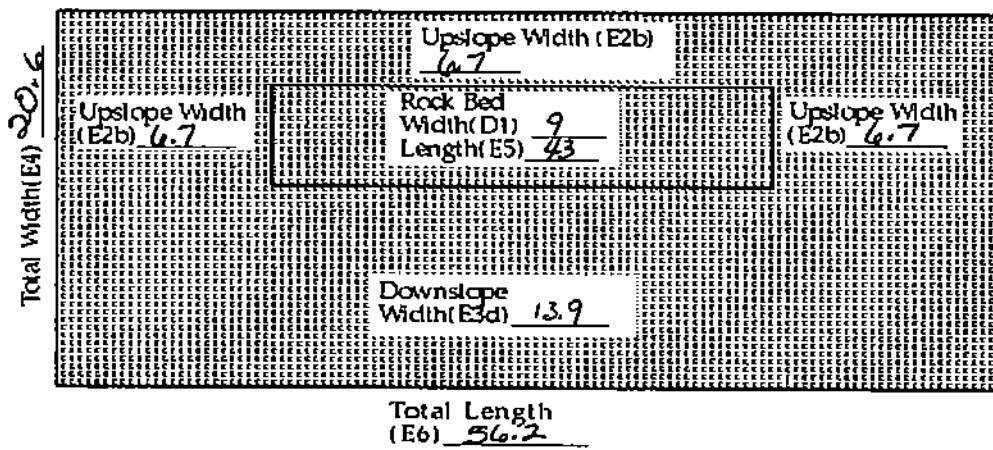
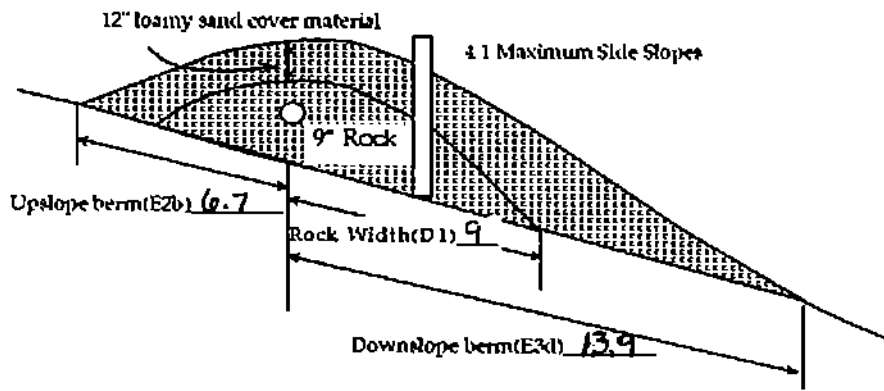
4. Weight of rock in tons = cubic yards times 1.4

F3 x 1.4 = tons 7.8 x 1.4 = 11.0 tons

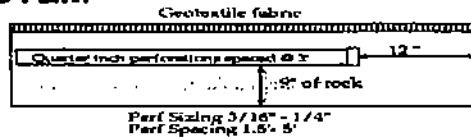
Percolation Rate (minutes per inch (mpi))	Soil Texture	Soil Sizing Factor square feet/gallon per day (ft <sup>2</sup> /gpd)
faster than 0.1"	Coarse sand Medium sand Loamy sand	0.83 0.83 0.83
0.1 to 0.5"	Fine sand Sandy loam	1.27 1.27
0.5 to 1.5"	Loam Silt loam Silt	1.67 2.00 2.00
1.5 to 4.0"	Clay loam Sandy clay Silty clay	2.50 2.50 2.50
4.0 to 6.0"	Clay Sandy clay Silty clay	3.26 3.26 3.26
6.0 to 12.0"	Clay Sandy clay Silty clay	4.26 4.26 4.26
Slower than 120"	Clay Sandy clay Silty clay	4.26 4.26 4.26

Land Slope, m%	UPSLOPE beam multipliers for beam slope ratio of 1:1	DOWNSLOPE beam multipliers for beam slope ratio of 1:1
0	1.0	1.0
1	1.05	1.17
2	1.10	1.35
3	1.15	1.54
4	1.20	1.75
5	1.25	1.98
6	1.30	2.25
7	1.35	2.55
8	1.40	2.88
9	1.45	3.25
10	1.50	3.65
11	1.55	4.08
12	1.60	4.55

Wayne Anderson	(signature)	1298	(license #)	May 16, 2003	(date)
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# PRESSURE DISTRIBUTION SYSTEM



All boxed rectangles must be entered, the rest will be calculated.

1. Select number of perforated laterals:

2. Select perforation spacing =  ft

3. Since perforations should not be placed closer than 1 foot to the edge of the rock layer (see diagram), subtract 2 feet from the rock layer length

$$\boxed{43} \text{ ft} - 2 \text{ ft} = \underline{41} \text{ ft}$$

rock layer length

4. Determine the number of spaces between perforations.

Divide the length (3) by perforation spacing (2) and round down to nearest whole number.

$$\text{Perforation spacing } \underline{41} \text{ ft} / \underline{2.5} \text{ ft} = \underline{16} \text{ spaces}$$

5. Number of perforations is equal to one plus the number of perforation spaces (4).

\* Check figure E-4 to assure the number of perforations per lateral guarantees < 10% discharge variation.

$$\underline{16} \text{ spaces} + 1 = \underline{17} \text{ perforations/lateral}$$

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).

$$\underline{17} \text{ perfs/lat} \times \underline{1} \text{ laterals} = \underline{17} \text{ perforations}$$

B. Calculate the square footage per perforation.

Should be 6-10 sqft/perf. Does not apply to at-grades.

1. Rock bed area = rock width (ft) x rock length (ft)

$$\boxed{9} \text{ ft} \times \underline{43} \text{ ft} = \underline{387} \text{ ft}^2$$

2. Square foot per perforation = Rock Bed Area / number of perfs (6)

$$\underline{387.0} \text{ ft}^2 / \underline{17} \text{ perfs} = \underline{22.8} \text{ ft}^2 / \text{perf}$$

7. Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforations (see figure E-6)

$$\underline{17} \text{ perfs} \times \boxed{0.74} \text{ gpm / perfs} = \underline{12.6} \text{ gpm}$$

8. If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter, enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5).

Select minimum diameter for perforated laterals =  inches

9. If perforated lateral system is attached to manifold pipe near the center, like Figure E-2, perforated lateral length (3) and number of perforations per lateral (5) will be approximately one half of that in step 8. Using these values, select minimum diameter for perforated lateral =  inches.

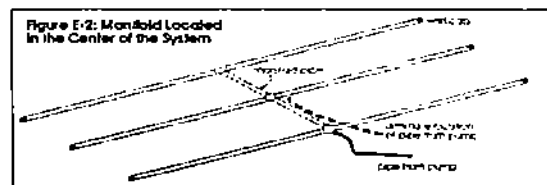
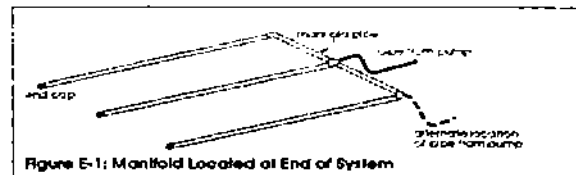
E-4: Maximum allowable number of 1/4-inch perforations per lateral to guarantee <10% discharge variation

perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	16	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

head (feet)	perforation diameter (inches)			
	1/8	3/16	7/32	1/4
1.0 <sup>a</sup>	0.18	0.42	0.56	0.74
2.0 <sup>b</sup>	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

<sup>a</sup> Use 1.0 foot for single-family homes.  
<sup>b</sup> Use 2.0 feet for anything else.



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

Wayne Anderson (signature)

1298 (license #)

May 16, 2003

# PUMP SELECTION PROCEDURE

All boxed rectangles must be entered, the rest will be calculated.

## 1. Determine pump capacity:

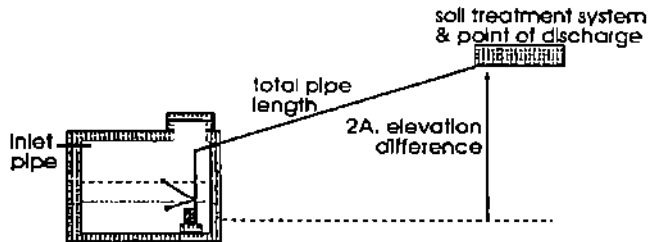
### A. Gravity Distribution

1. Minimum required discharge is 10 gpm
2. Maximum suggested discharge is 45 gpm

For other establishments at least 10% greater than the water supply rate, but no faster than the rate at which effluent will flow out of the distribution device.

### B. Pressure Distribution - see pressure design worksheet

Selected Pump Capacity: 20 gpm



## 2. Determine head requirements:

### A. Elevation difference between pump and point of discharge.

8 feet

### B. Special head requirement? (See Figure - Special Head Requirements)

5 feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

### C. Friction loss

1. Select pipe diameter 2 in
2. Enter Figure E-9 with gpm (1A or B) and pipe diameter (C1)

Read friction loss in feet per 100 feet from Figure E-9

Friction loss = 0.73 ft/100 ft of pipe

3. Determine total pipe length from pump discharge to soil system discharge point. Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

15 ft x 1.25 = 18.75 feet

4. Calculate total friction loss by multiplying friction loss (C2) by the equivalent pipe length (C3) and divide by 100.

FL = 0.73 ft/100ft X 18.75 ft / 100 = 0.1 feet

### D. Total head requirement is the sum of elevation difference (A), special head requirements (B), and total friction loss (C4).

8 ft + 5 ft + 0.1 ft

**Total Head:** 13.1 feet

E-9: Friction Loss in Plastic Pipe			
Per 100 feet			
flow rate gpm	nominal pipe diameter		
	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.75	1.16	0.16
30	5.23	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55	16.17	4.76	0.68
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

## 3. Pump Selection

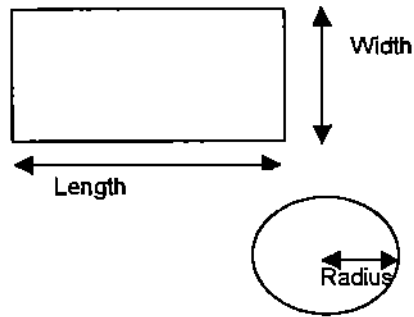
1. A pump must be selected to deliver at least 20 gpm (1A or B) with at least 13.1 feet of total head (2D).

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

Wayne Anderson (signature) 1298 (license #) May 16, 2003

## DOSING CHAMBER SIZING

All boxed rectangles must be entered, the rest will be calculated.



- Determine area
  - Rectangle area =  $L \times W$   
 $\boxed{6}$  ft x  $\boxed{3.33}$  ft =  $\underline{19.98}$  ft<sup>2</sup>
  - Circle area =  $3.14 \times \text{radius}^2$   
 $3.14 \times \boxed{\phantom{00}}^2$  ft =  $\underline{0.0}$  ft<sup>2</sup>
  - Get area from manufacture  $\boxed{\phantom{00}}$  ft<sup>2</sup>
- Calculate gallons per inch  
 There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.  
 Surface area x 7.5 / 12 =  $\underline{19.98}$  ft<sup>2</sup> x 7.5 / 12 in/ft =  $\underline{12.4875}$  gallon per inch

**Legal Tank:**  
**500 gallons or**  
**100% the daily flow**  
**or Alternating Pumps**

- Calculate total tank volume
  - Depth from bottom of inlet pipe to tank bottom  $\boxed{40}$  in
  - Total tank volume = depth from bottom of inlet pipe to tank bottom(3A) x gal/in(2)  
 $= \underline{40}$  in x  $\underline{12.4875}$  gal/in =  $\underline{499.5}$  gallons
- Calculate gallons to cover pump (with 2-3 inches of water covering pump)  
 (Pump and block height + 2 inches) x gallon per inch  
 $(\boxed{16} + 2 \text{ in}) \times \underline{12.4875}$  gal/in =  $\underline{224.8}$  gallons

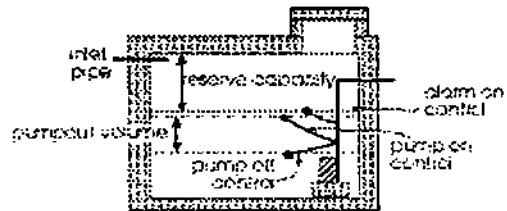
number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	150	60%
3	450	300	218	of the
4	600	375	256	volumes
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	volumes.

- Calculate total pumpout volume
  - Select pump size for 4-5 doses per day. Gallon per dose = gpd (see Figure A-1) / doses per day =  
 $\boxed{300}$  gpd /  $\boxed{5}$  doses/day =  $\underline{60}$  gallons
  - Calculate drainback
    - Determine total pipe length  $\boxed{15.0}$  ft
    - Determine liquid volume of pipe,  $\boxed{0.17}$  gal/ft (see figure E-20)
    - Drainback quantity =  $\underline{15.0}$  ft (5B1) x  $\underline{0.17}$  gal/ft(5B2) =  $\underline{2.6}$  v
  - Total pump out volume = dose volume(5A) + drainback (5B3)  
 $\underline{60}$  gallons +  $\underline{2.6}$  gallons =  $\underline{62.6}$

Pipe Diameter inches	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

- Calculate float separation distance (using total pumpout volume)  
 Total pumpout volume(5C) / gal/inch(2)  
 $\underline{62.6}$  gal /  $\underline{12.4875}$  gal/in =  $\underline{5.0}$  inch
- Calculate volume for alarm (typically 2 - 3 inches)  
 Alarm depth (inch) x gallon/inch(2) =  $\boxed{2}$  in x  $\underline{12.4875}$  gal/in =  $\underline{24.975}$  gal
- Calculate total gallons = gallons over pump(4) + gallons pumpout(5C) + gallons alarm(7)  
 $\underline{224.8}$  gal +  $\underline{62.6}$  gal +  $\underline{24.975}$  gal =  $\underline{312.3}$  gal
- Total tank depth = total gallons(8) / gallon/in(2)  
 $\underline{312.3}$  gallons /  $\underline{12.4875}$  gal/in =  $\underline{25.0}$

<b>Recommended</b>	
Calculate reserve capacity (75% of the daily flow)	
Daily flow x 0.75 =	$300 \times 0.75 = \underline{225}$ gallons

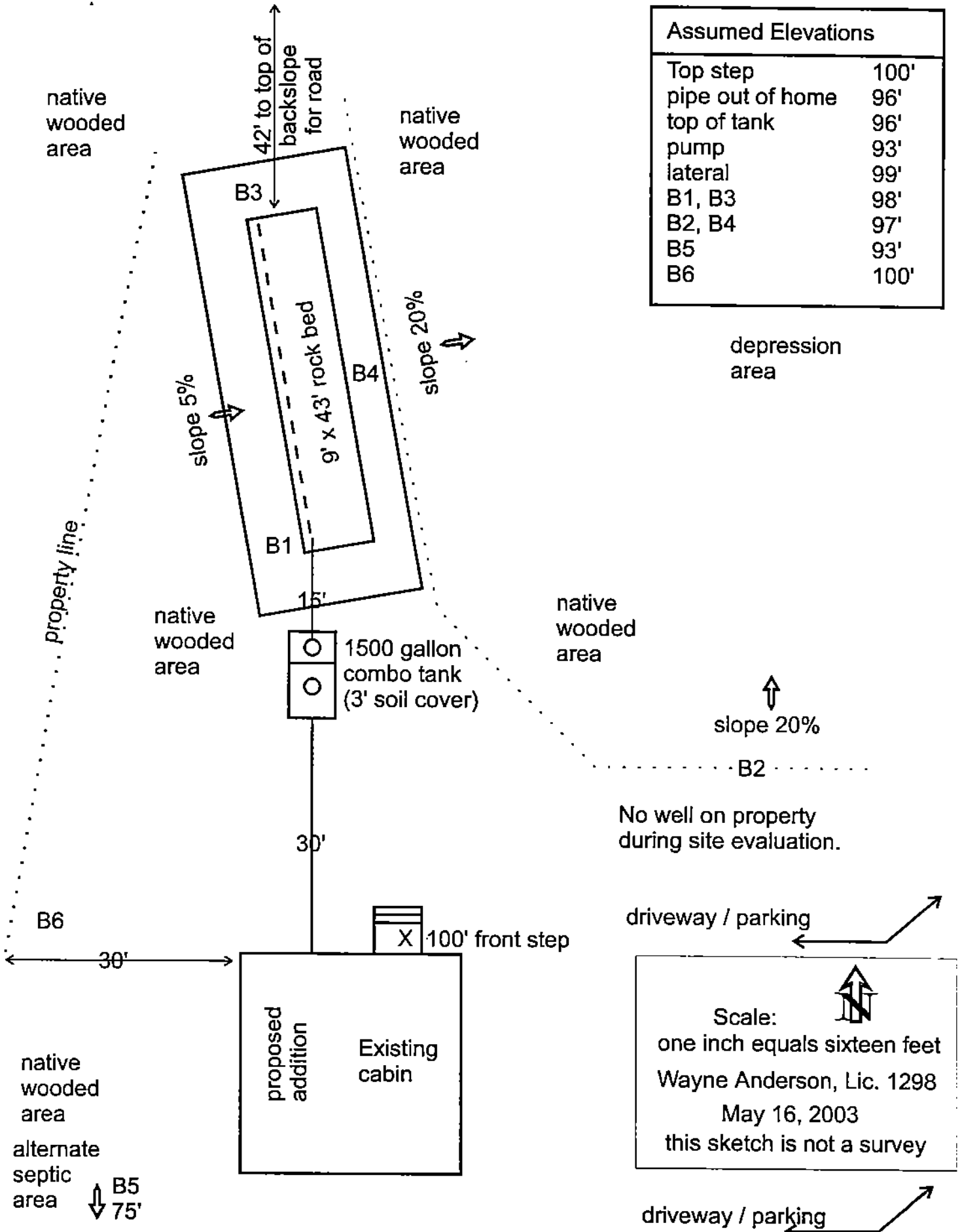


I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws		
Wayne Anderson	(signature)	1298 (license #)
		May 16, 2003

#2418 Donald Cunningham  
May 16, 2003

BORING #	DEPTH	TEXTURE	MATRIX	MOTTLES CONTRAST	STRUCTURE		CONSISTENCE	ROOTS	NOTES
					SHAPE	GRADE			
BORING # 1	6"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	36"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	
	40"	Sand	7.5YR4/4	Distinct	Granular	Weak	Loose	Yes	
BORING # 2	4"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	22"	Sand Loam	7.5YR4/4		Blocky	Moderate	Friable	Yes	
	36"	Fine Sand	7.5YR4/4		Granular	Weak	Loose	Yes	
	38"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	Rocky unable to penetrate rock
BORING # 3	5"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	18"	Sand Loam	7.5YR4/4		Blocky	Moderate	Friable	Yes	
	36"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	Rocky unable to penetrate rock
BORING # 4	5"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	28"	Sand Loam	7.5YR4/4		Blocky	Moderate	Friable	Yes	
	36"	Fine Sand	7.5YR4/4		Granular	Weak	Loose	Yes	
	45"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	Rocky unable to penetrate rock
BORING # 5	7"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	36"	Silt Loam	7.5YR4/4		Blocky	Moderate	Friable	Yes	
	44"	S. S. L.	7.5YR4/4	Distinct	Blocky	Moderate	Friable	Yes	(sandy silt loam)
BORING # 6	5"	Topsoil	7.5YR2/2		Blocky	Moderate	Friable	Yes	
	26"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	rocky
	54"	Sand	7.5YR4/4		Granular	Weak	Loose	Yes	no rocks ended boring

Donald Cunningham, Part of NW 1/4 of SE 1/4, Sec. 26, Wagner Twp., Pine Co.




Assumed Elevations	
Top step	100'
pipe out of home	96'
top of tank	96'
pump	93'
lateral	99'
B1, B3	98'
B2, B4	97'
B5	93'
B6	100'

depression area

No well on property during site evaluation.

driveway / parking

Scale:   
 one inch equals sixteen feet  
 Wayne Anderson, Lic. 1298  
 May 16, 2003  
 this sketch is not a survey

driveway / parking



**AITKIN COUNTY**  
**CERTIFICATE OF COMPLIANCE/NOTICE OF NONCOMPLIANCE**

This certificate of compliance/notice of noncompliance has been issued this \_\_\_\_\_ day of 6/9/03 to certify compliance/noncompliance with Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No.

1. The premises covered by this certificate are legally described as:

lot 2 BIK 3 ; Und 1/4 lot in outlet A Ridge Haven  
Section 26 Township 43 Range 22 Lake Pine Lake  
PERMIT NO. 30409 Owner Name Donald Cunningham  
Address 33550 Elmo Ave, Stacy, MN. 55079  
Installer Name Roger Revier  
Type of System Inspected AT Gravel

The certificate of compliance/notice of noncompliance was based on, No 1 of the following:

- Inspection of the installation or construction as in accordance with the above referenced permit and application design.
- 2) Review of as-built plans submitted in accordance with Subdivision 4.21 C. Of Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No. 1.

If the above permitted individual sewage treatment system is in noncompliance with Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No. 1, then the following shall serve as a Notice of Violation:

1) Statement of the findings of fact through inspections or investigations: \_\_\_\_\_

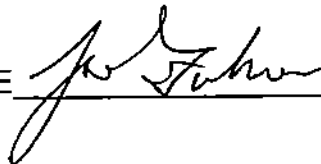
2) List of specific violations of Ordinance: \_\_\_\_\_

3) Requirements for correction or removal of violations: \_\_\_\_\_

4) Time schedule for compliance: \_\_\_\_\_

Failure to correct or remove the above violations will result in this matter being turned over to the Aitkin County Attorney's Office for further legal action which may result in revocation of licenses or registrations, fine's and/or imprisonment.

INSPECTOR SIGNATURE \_\_\_\_\_





20207



PLATE 21

50407

**INDIVIDUAL SEWAGE TREATMENT SYSTEM INSPECTION FORM**  
**AITKIN COUNTY, MINNESOTA**

Township Wagner Date of Inspection 6/9/03 Permit Number 30409  
 Owner Donald Cunningham Parcel Number 34-1-08266  
 Project Address lot 2 BLK 3 + and 1/4 lot in outlot A Installer Roger Reimer  
 City \_\_\_\_\_ Zip Code \_\_\_\_\_ New \_\_\_\_\_ Repair \_\_\_\_\_

**DIST. or DROP BOX & TYPE**

**TRENCHES, BEDS, OR GRAVELLESS LEACHFIELD:**

**SETBACKS:**  
 Buildings to tank(s) 25'  
 Buildings to drainfield 50'  
 Well(s) 50' or 100' NA  
 Lake/Creek/Wetland NA  
**SEPTIC TANKS:**  
 Liquid capacity 1600 Combo  
 Manufacturer & type Ply Pre-cast  
 Type of baffle Plastic  
 Inspection pipes 1 - 4"  
 Manholes access 1  
 No. & height of risers 24"

Trench depth \_\_\_\_\_  
 Trench length \_\_\_\_\_  
 Trench bottom width \_\_\_\_\_  
 Trench bottom level At Grade  
 Trench spacing \_\_\_\_\_  
 Drainfield rock below pipe \_\_\_\_\_  
 Size of gravelless pipe \_\_\_\_\_  
 Depth of backfill \_\_\_\_\_  
 Absorption area: square feet \_\_\_\_\_  
 lineal feet \_\_\_\_\_

**MOUNDS:**

Percent slope \_\_\_\_\_  
 Upslope dike width \_\_\_\_\_  
 Downslope dike width At Grade  
 Sideslope dike width \_\_\_\_\_  
 Drainfield rock below pipe 9"  
 Depth of sand below rock 1/4 - 2 1/8  
 Perforation size & spacing 1 1/2" - 1 perforated  
 Pipe size & spacing 9 X 43  
 Dimensions of rock bed \_\_\_\_\_  
 Dimensions of sand base \_\_\_\_\_  
 Final cover \_\_\_\_\_

**PUMPS:**

Tank capacity 600  
 Tank manufacturer & type Ply Pre-cast  
 No. & height of risers 24"  
 Pump manufacturer & model# Liberty JES  
 Horsepower & GPM 1/2 - 50  
 Feet of head 8  
 Cycles per day 5  
 Gallons per cycle 100  
 Size of discharge line 2"  
 Type of electrical hookup Post  
 Type & location of alarm Elec out Door  
 Cycle counter (commercial) \_\_\_\_\_

**DRAWING OF SYSTEM**

