Oregon
Tina Kotek, Governor

Department of Environmental Quality
Eastern Region Bend Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
(541) 388-6146
FAX (541) 388-8283
TTY 711

October 6, 2025

Aaron Schwartz & Elizabeth Dantzker
17074 Cooper Drive
Bend, OR 97707

Re: WQ: Variance Approval: 248-25-000238-VAR: 17256 Lodgepole Lane; T.20S; R.11E; Sec. 31B; Tax Lot 6600; 2.03 Acres via easement on lot 6700; Deschutes County.

Dear Aaron Schwartz & Elizabeth Dantzker,

This correspondence verifies that a variance hearing provided for under Oregon Administrative Rules 340-071-0430, was held on the site at 2:00 pm on August 26, 2025, for the subject property referenced above on Lodgepole Lane in Deschutes County. The purpose of the hearing was to provide a forum for the presentation of supportive facts to show that strict compliance with certain rules regulating onsite sewage disposal are inappropriate, or that special physical conditions at the site render strict compliance unreasonable, burdensome or impractical. The proposal and associated supporting information you provided with the application was presented during the recorded hearing.

Variance Decision:
Based on review and evaluation of the variance record and observations made during the variance hearing, I am pleased to inform you that the variance from the rules cited above is hereby granted. In my opinion, it would be unreasonable to prohibit this method of wastewater treatment by strictly following the administrative rules at this specific location at this time. It is my judgement that the proposed system is not likely to present a public health hazard risk or have any significant adverse impacts to groundwater or surface water quality if properly operated and maintained.

Justification for this decision:

- The proposed Orenco® AdvanTex AX20N-Mode 3B system is currently approved as a system meeting DEQ's Treatment Standard 2; OAR 340-071-0100(168) "Treatment Standard 2".
- On average, the AX20N-Mode 3B system is one of the best available technologies for Total Nitrogen treatment that has been approved for use in Oregon and is expected to treat residential wastewater to 20 mg/L Total Nitrogen, which is about two thirds of a reduction from that of a standard system and about half from a sand filter system in this climate.
- Treatment Standard 2, for the reduction of fecal coliform, will be met or exceeded with pre-treated effluent from the AX20N-Mode 3B unit (proposed w/o UV disinfection) and the RidNOx™ unit that will discharge into a 250 square foot bottomless sand filter with an additional 12-inches of sand filter media (embedded 6-inches below ground surface) placed below the filter to meet or exceed the minimum 24-inch separation requirement to groundwater below. Note: The bottomless sand filter is assumed to meet Treatment Standard

2 criteria independently of the ATT, which is why UV disinfection is not included in the proposal.

- Overall Treatment: Treatment first occurs within the AX20N-Mode 3B system (w/o UV) for reductions in TSS, BOD_5 and Total Nitrogen (TN). The RidNOx™ unit is expected to further reduce TN (and Nitrate) as the effluent passes through and makes contact with the soluble carbon being released from the wood chip material. Final discharge will occur through the elevated bottomless sand filter, which may provide some additional reduction/treatment of BOD_5, TSS, Fecal Coliform and TN. It is expected that the final effluent being discharged shall meet or exceed that of the similar Nitrex unit, that was tested during the La Pine National Demonstration Project, which averaged a 96% reduction of TN. The final effluent Nitrate concentration is expected to be well under the EPA drinking water standard of 10 mg/L as well as local action levels set at 7 mg/L.
- The proposed system, with innovative technology, shall be required to be maintained by a certified maintenance provider for the life of the system. Additionally, the system shall be monitored and sampled at regular intervals to ensure that the system is performing as expected. The sampling, monitoring, and maintenance of the system shall be reported to Deschutes County on an annual basis.

Standards found in Oregon Administrative Rules Chapter 340, Division 071 & 073 have been developed to protect public health and the environment in Oregon. The variance officer's duty is to determine if in their professional judgement, the system proposed for this variance consideration is adequate to safeguard the public's health and the environment if variance from the standards noted above are granted. In my opinion, your proposal adequately addresses the limitations present at the site.

Other Considerations:
The effluent from the ATT and RidNOx™ system, discharging through a bottomless sand filter, will have a significant reduction in BOD, TSS, TN, and Fecal Coliform. In this proposal, treated ATT to RidNOx™ effluent will be discharged into a 250 square foot bottomless sand filter with an additional 12- inches of sand filter media embedded 6 - inches into the native soil that will be used to exceed the 24-inch separation from the shallowest water table depth standard by providing a total separation of 27 - inches. The additional media will mitigate the lack of vertical separation from the bottom of the sand filter to the highest level of groundwater on site. The RidNOx™ unit is expected to provide a significant reduction of Total Nitrogen (and Nitrate) before the treated effluent enters the bottomless sand filter with a basal area intersecting the native soil and ultimately the groundwater below.

This variance approval is being granted on the condition that requirements contained in the enclosed schedules are met. Schedules A and B (attached) include requirements and specifications for the design and location of the system approved through this variance. Failure to meet these conditions may cause the variance approval to become null & void.

Site History & Variance Proposal:
Deschutes County conducted a site evaluation with 4 test pits on the southern portion of the parcel within the subject property on May 28, 2024, where a denial was issued for the use of an onsite wastewater system on June 3, 2024. After the denial, two additional test pits were evaluated on the northwestern portion of the parcel that were unable to be approved. The primary reason for denial

was due to the predicted depth to the seasonally high permanent water table being less than 24-inches below the ground surface. Observed conditions associated with saturation that are used to determine water table levels and site suitability were observed between 8- inches and 13-inches below ground surface (bgs). The adjoining tax lot 6700 was evaluated in 2004 and found conditions associated with saturation between 6 and 19 inches bgs, and the best area of tax lot 6700 will be granting an easement for onsite wastewater use by tax lot 6600.

The proposal to overcome the site limitations is by installing an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology System followed by a RidNOx™ solid-phase carbon flow-through filter before discharging to a 250 sq. ft. elevated Bottomless Sand Filter system constructed on a 12-inch bed of sand filter media embedded 6 inches into the native soil. It is expected that the highest level of groundwater within the lowest point of the sand filter areas will come to 21- inches bgs. The proposal overcomes this limitation by providing additional sand filter media with 7- inches (9 – inches for replacement) of extra vertical separation and providing a total 30-inch separation to the shallowest predicted groundwater depth. The rest of the sand filter will be "conventional" from there up, consisting of 6 inches of underdrain media, 24- inches of sand filter media, 6- inches of drain media (with the distribution laterals), filter fabric, and 6-9 inches deep of final backfill on top. The sand filter will be contained within a supporting berm with a slope no steeper than 3:1.

You are seeking a variance from the following Oregon Administrative Rules (OAR):

340-071-0135(1) – which addresses DEQ approval of new or innovative technologies, materials, or designs for onsite systems. **This rule is being varied from due to deviating from the approved design for the AX20N in Mode 3B by not requiring UV disinfection. Treatment Standard 2 will still be met or exceeded without the UV disinfection by discharging the treated effluent through a bottomless sand filter.**

340-071-071-0150(4)(a)(B) - which requires all criteria for approving a specific type or types of systems, as described in this division are satisfied.

340-071-0290(4)(d) which states: Bottomless Sand Filter. Sites may use a conventional bottomless sand filter if the site meets the criteria in this section and section (3) of this rule. (d) The water table is at least 24- inches below the ground surface throughout the year, and a minimum 24-inch separation is maintained between a water table and the bottom of the sand filter.

Should future ATT technologies for treatment of Total Nitrogen be approved for use in Oregon before issuance of a construction-installation permit for this site, Deschutes County may allow installation of equal or better technology instead of the type noted in this approval.

Conclusion:
The decision to grant your variance request is a Final Order of DEQ. Any person who is adversely affected or aggrieved by this Order is entitled to a contested case hearing before the Environmental Quality Commission. A request for a hearing must be received by DEQ within twenty days from the date of certified mailing of this Order. The request must specifically describe how the Order fails to meet the requirements of Oregon Revised Statutes 454.657 and 454.660, and include the technical basis that supports the petition. The appeal must be directed to the Environmental Quality

Commission, in care of Lindsay Trapp, EQC Assistant, Department of Environmental Quality, 700 NE Multnomah St., Suite 600, Portland, OR 97232-4100.

Deschutes County onsite staff is hereby authorized to issue a construction-installation permit, subject to all the conditions, upon their receipt of a complete permit application. The application must include a favorable land use compatibility statement issued by Deschutes County, a set of detailed plans and specifications for the onsite wastewater treatment system, a current maintenance service agreement and the appropriate application fee.

Please feel free to contact me if you have any questions concerning this decision. I can be reached by telephone at (541) 776-6130, or by email at david.hurley@deq.oregon.gov.

Sincerely,

David Hurley, REHS
Variance Officer – Onsite Wastewater Program

Encl: Schedule A- Special Conditions
Schedule B- Approved Plans
Approved Drawings / Schematics

cc: Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703
Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814
Shue Revocable Trust, 5737 Doverton Way, Chino Hills, CA 91709
Marshall Homestead, LLC, PO Box 5665, Bend, OR 97708
Zahir Nasratyar & Christina Marlena, 6552 Doral Dr, Huntington Beach, CA 92648
Angela Rinehold, 61188 Sleepy Ct, Bend OR 97702
Blaine & Lisette Hulstrom, 7714 SW Barns Rd # Unit A, Portland, OR 97225
RJL LLC, 1303 SE Armour Rd, Bend, OR 97702
James & Amy Gillian, 60586 Robinette Rd, Saint Helens, OR 97051

Schedule A – Lodgepole Lane Schwartz & Dantzker
Variance Report - Special Conditions
T 20S, R 11E, Sec: 31B, TL 6600

Special Conditions and requirements for the Orenco® AX20N-Mode 3B Alternative Treatment Technology unit with a RidNOx™ system followed by an elevated 250 square foot Bottomless Sand Filter at 17256 Lodgepole Lane; T.20S; R.11E; Sec. 31B; Tax Lot 6600; Lot 36, 2.03 Acres via Easement given from tax lot 6700; Deschutes County.

1. A person or business licensed by the Department of Environmental Quality in accordance with Oregon Revised Statutes, Chapter 454.695, must perform all work construction of this onsite wastewater treatment system.

2. Before starting with the actual construction of this system, the system installer shall submit, through a written statement to the Deschutes County Community Development Department, Onsite Wastewater Division (hereafter referred to as "County") that acknowledges that they have thoroughly reviewed the conditions of this variance approval with technical staff in that office, and they understand and will comply with all conditions associated with this variance approval.

3. This system incorporates the use of Sand Filter Media and Underdrain media, as defined in Oregon Administrative Rules (OAR) 340-071-0100(124) and OAR 340-071-0100(170). Prior to delivery to the site, a current sieve analysis, using testing requirements required in rule for the respective material, must be submitted for review and approval to the County. Special handling of the respective media is to occur, during transport, site storage, and construction of the sand filter.

4. This onsite wastewater treatment system shall serve a single-family residence with up to four bedrooms. The projected daily sewage flow must not exceed 450 gallons per day, and the average daily flow must not exceed 225 gallons per day. Where practical, low water-use plumbing fixtures and appliances should be used within the dwelling in conjunction with water conservation practices. **Use of a garbage disposal is not recommended.**

5. All construction of this system shall only occur under optimum soil moisture conditions. The soils must be nearly dry and not frozen. Typically, the ideal construction period begins at the end of spring run-off season and ends prior to the onset of winter weather.

6. The setback to all wells from the initial or replacement bottomless sand filters is to be at least 100 feet.

7. The County shall inspect the installation of this system at those stages of construction they identify as appropriate to ensure proper construction.

8. Except as specifically authorized, all requirements of the Oregon Administrative Rules (Chapter 340, Rules 071-0100 through 071-0650) must be met.

9. The permittee shall comply with all local planning, zoning and building ordinances.

10. A Certificate of Satisfactory Completion shall be issued for the completed installation only if all conditions of this variance approval are met.

11. Should the onsite wastewater treatment and disposal system, authorized through this variance fail, County staff may exercise professional discretion in effecting a repair, based upon an analysis of the possible causes of failure. An area next to the initial sand filter is to be designated for future repair or replacement and must be reserved for this use. The replacement system considered in this variance procedure is the installation of another sand filter.

APPROVED

By DEQ Variance Officer 10/6/25

David Hurley

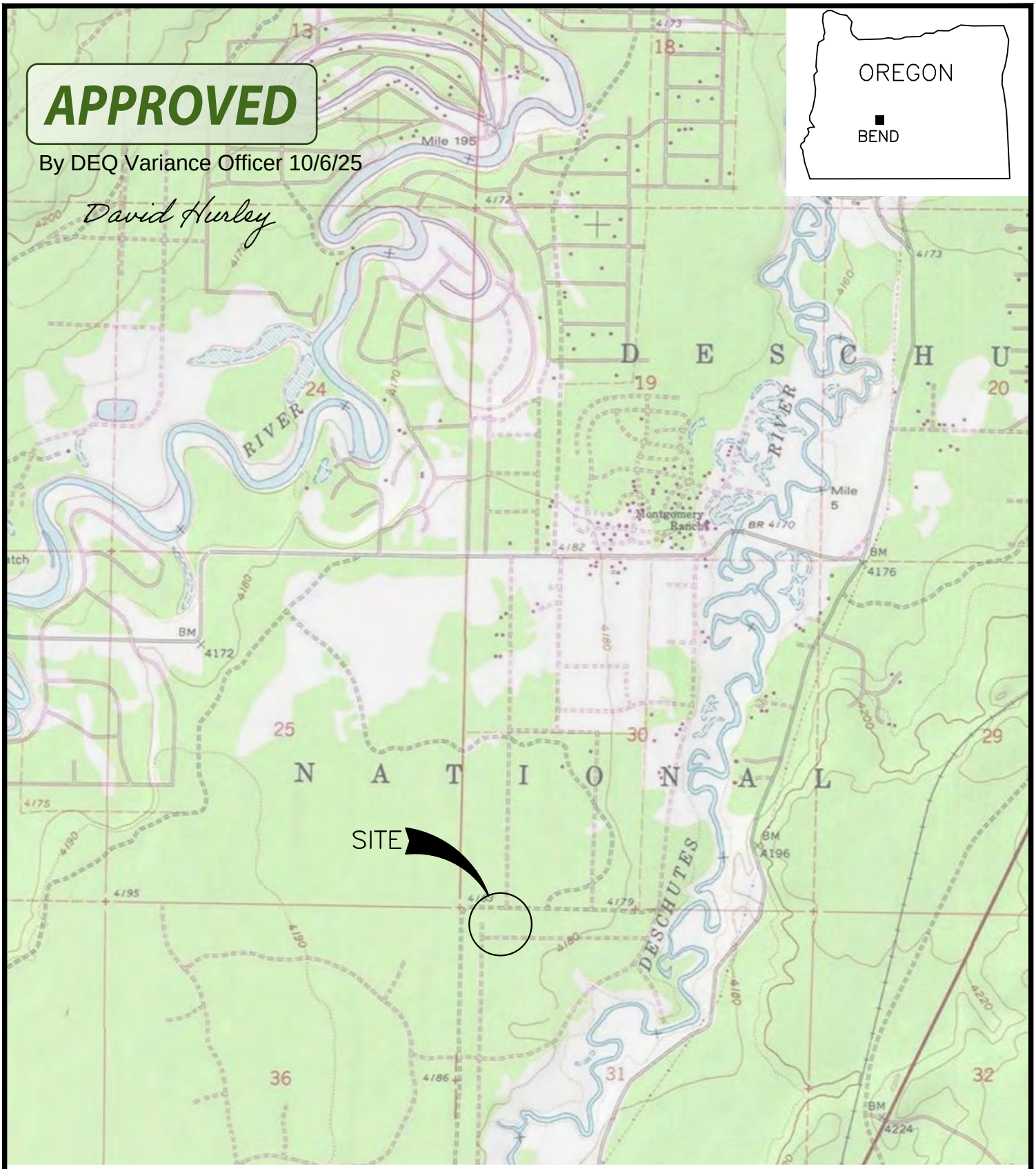

Figure 1. Vicinity Map

0 2,000'

1" = 2,000'

(LOCATIONS AND SCALE ARE APPROXIMATE)

(SOURCE: ©2013 National Geographic Society, i-cubed)

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DATE: 6/30/2025	
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker 17256 Lodgepole Lane Bend, OR 97707
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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TAX LOT 1400 APPROVED (1979)
WILL NOT BE HONORED

HOMESTEAD WAY

TAX LOT 1301 APPROVED (1982)
BOTTOMLESS SAND FILTER – INSTALLED (1989)

LIVELY LANE

N

T20S, R11E, SECTION 31B, TAX LOT 6600

220'

TAX LOT 6700
APPROVED (1976) DENIED (2004)
VARIANCE ATT + CARBON–ENHANCED MBSF
(APPROVED 2022, INSTALLED 2025)

TAX LOT 6800
NO RECORDS
(RECORDS ON DIAL ARE FOR
NEXT LOT TO THE EAST)

TAX LOT 6500
DENIED (2022)

100'

PROPOSED WELL

50'

WELL

50'

PROPOSED SHOP (40'x60')

405'

405'

CLEANOUTS

HOUSE

5' MIN

PROPOSED HOUSE (50'x50')

PROPOSED 10'X25' MODIFIED BOTTOMLESS SAND FILTER

PROPOSED EASEMENT BOUNDARY
(FROM TAX LOT 6700
TO TAX LOT 6600)

TEST PIT 1 (2004)

TEST PIT 2 (2004)

55'

PROPOSED GARAGE (25'x32')

48'

10'

R

I

15'

TBM – TOP OF IRON ROD

5' MIN

220'

12'

55'

SUPPLEMENTAL TEST PIT (2025)

PROPOSED 10'X25' REPLACEMENT AREA

LODGEPOLE LANE
(17256)

TAX LOT 6400
NO RECORDS

TAX LOT 6300
NO RECORDS

TAX LOT 4600
ATT + BSF (2022)

TAX LOT 4400
BOTTOMLESS SAND FILTER (1997)

0 60'

1"=60'

(SCALE AND LOCATIONS ARE APPROXIMATE)

Figure 2. Site Plan

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
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DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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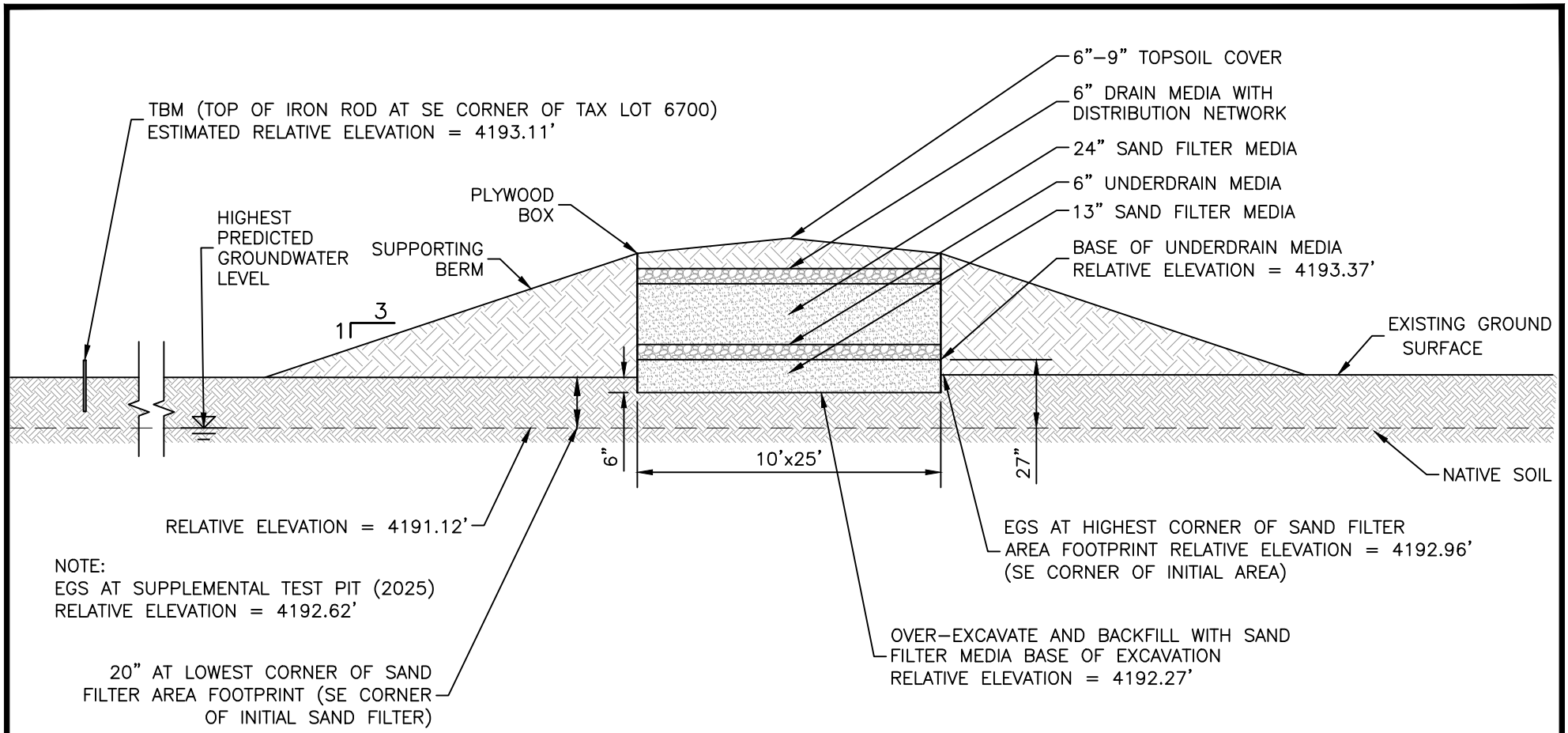

Figure 3A. Modified Bottomless Sand Filter Section – Initial

0 5'

1"=5'

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1–6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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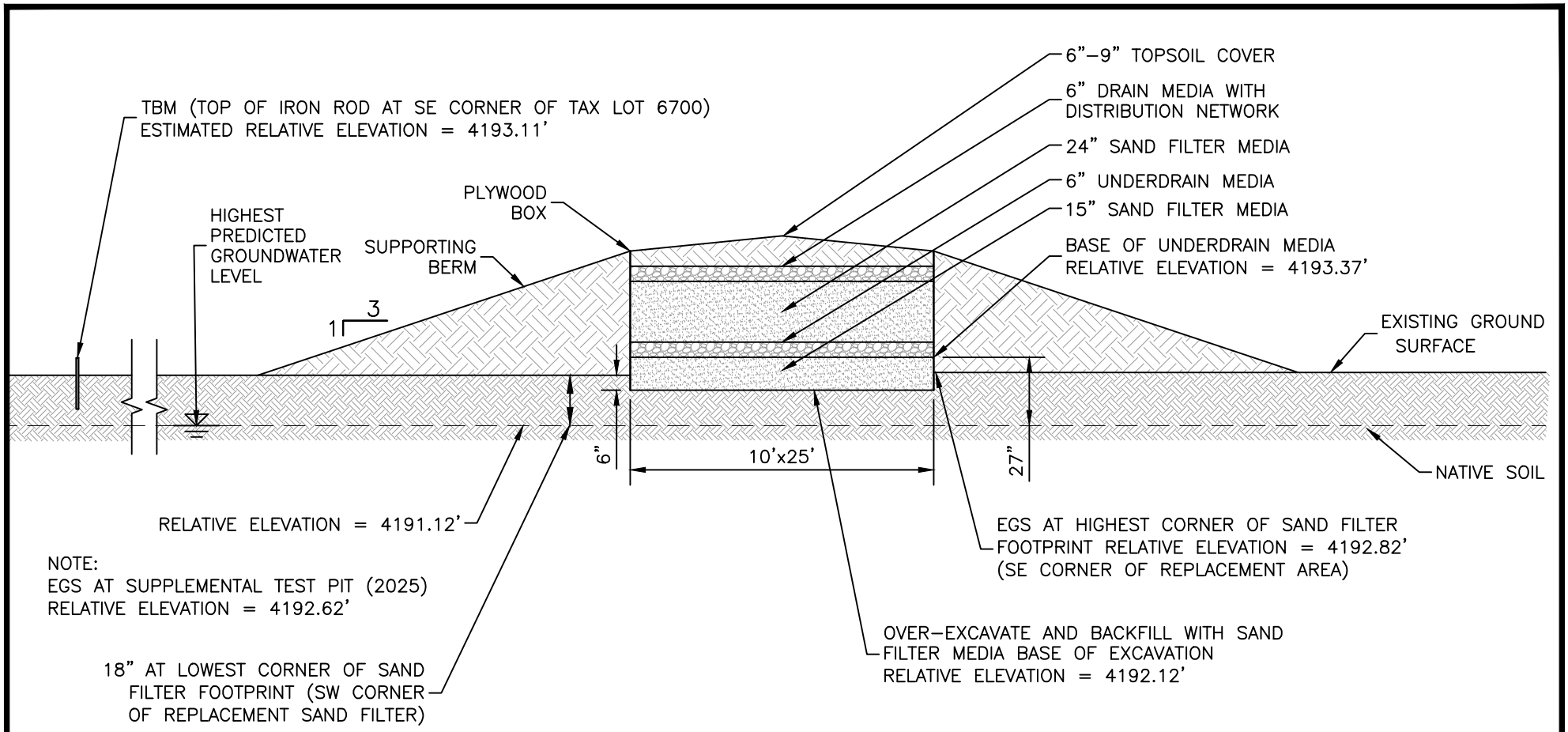

Figure 3B. Modified Bottomless Sand Filter Section – Replacement

0 5'

1"=5'

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
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DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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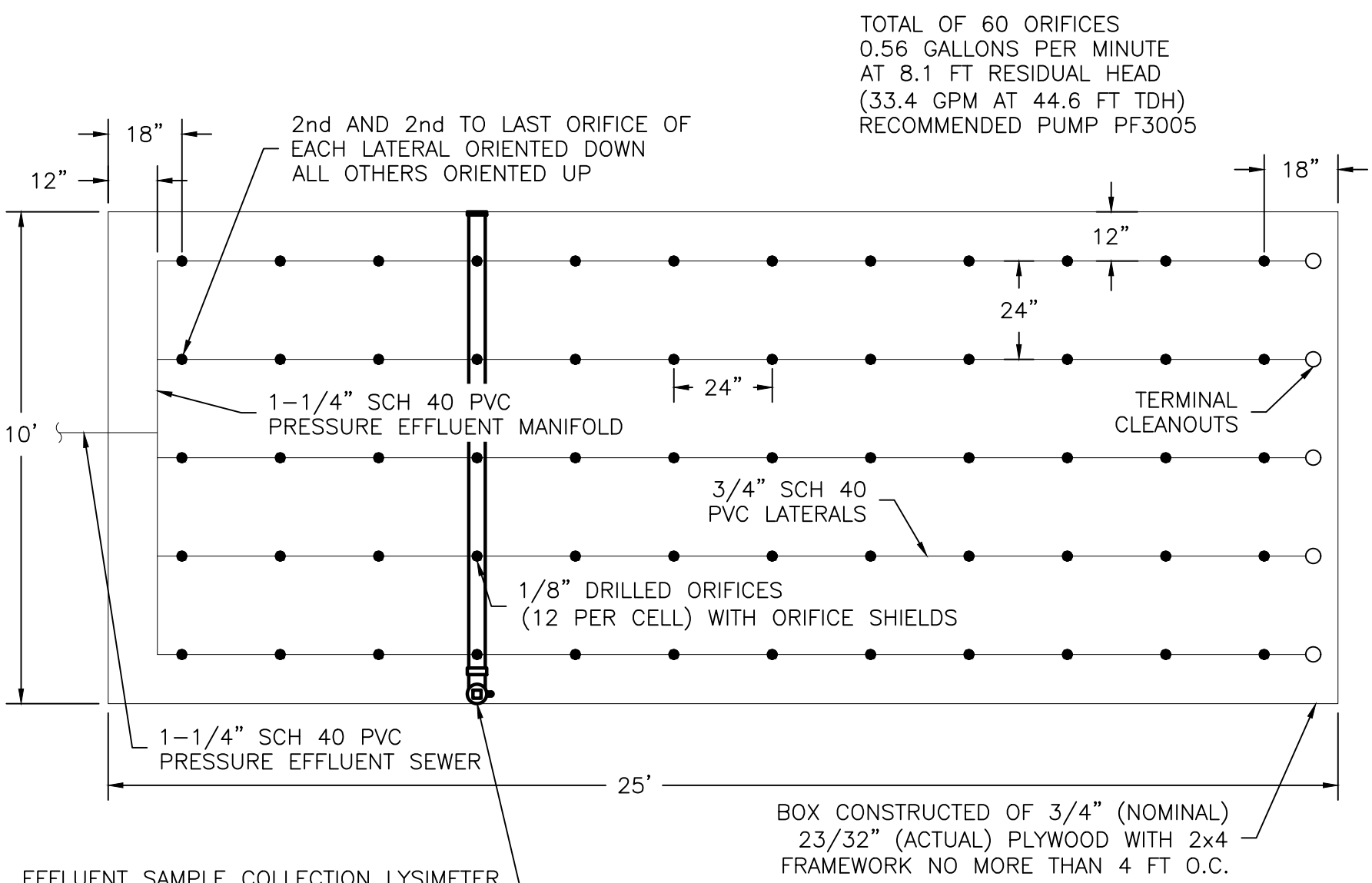

Figure 4. Sand Filter Plan Detail

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DATE: 6/30/2025	
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker 17256 Lodgepole Lane Bend, OR 97707
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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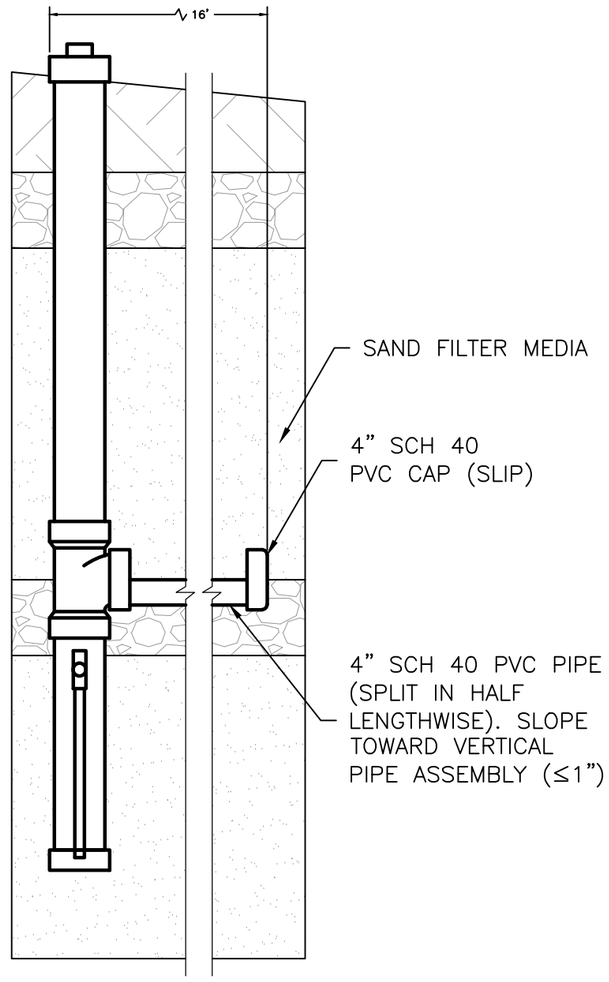
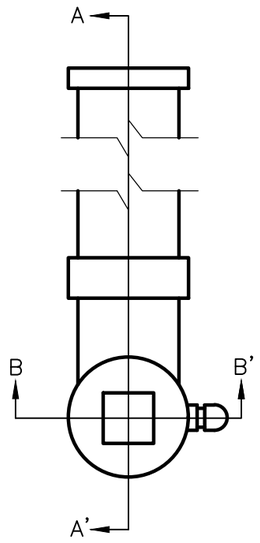


VIEW A–A'

0 1'

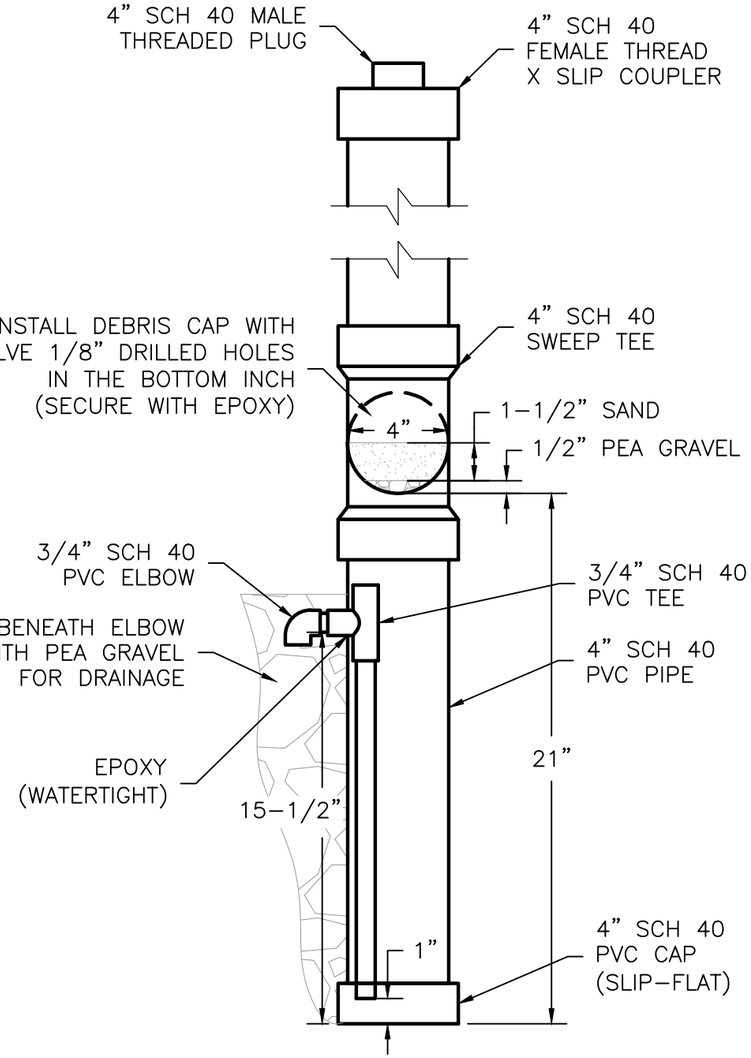
1"=1'



PLAN VIEW

0 0.5'

1"=0.5'



VIEW B–B'

0 0.5'

1"=0.5'

Figure 5. Lysimeter Details

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
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DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
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	ELKHORN CONSULTING LLC

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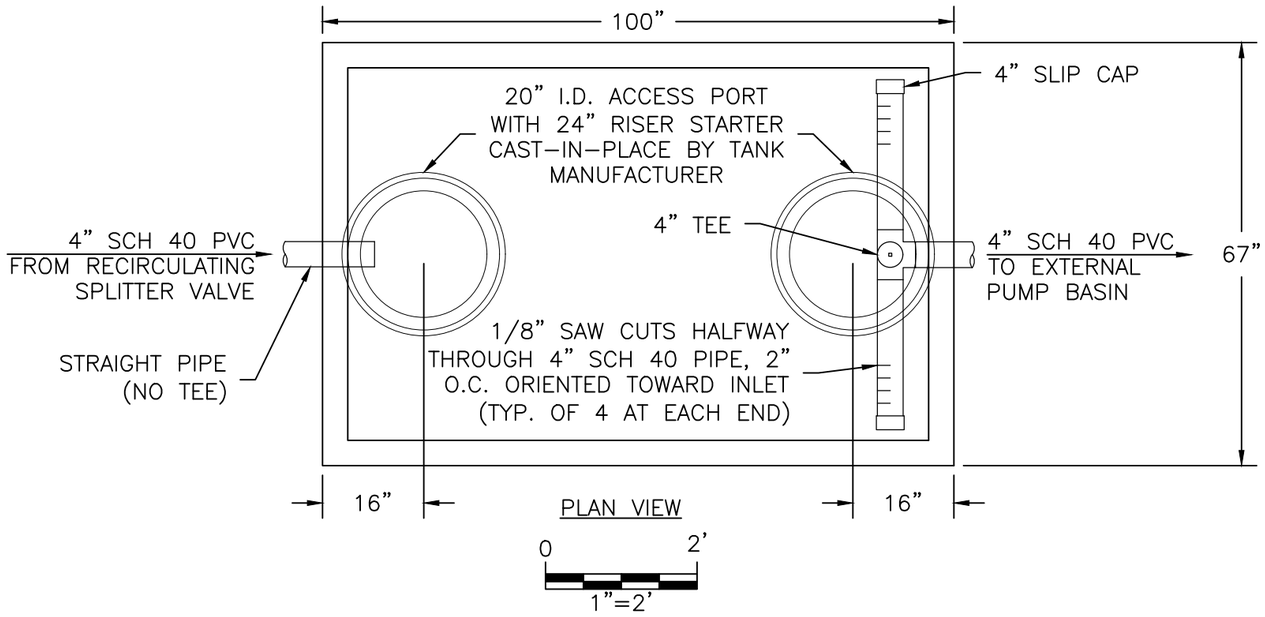

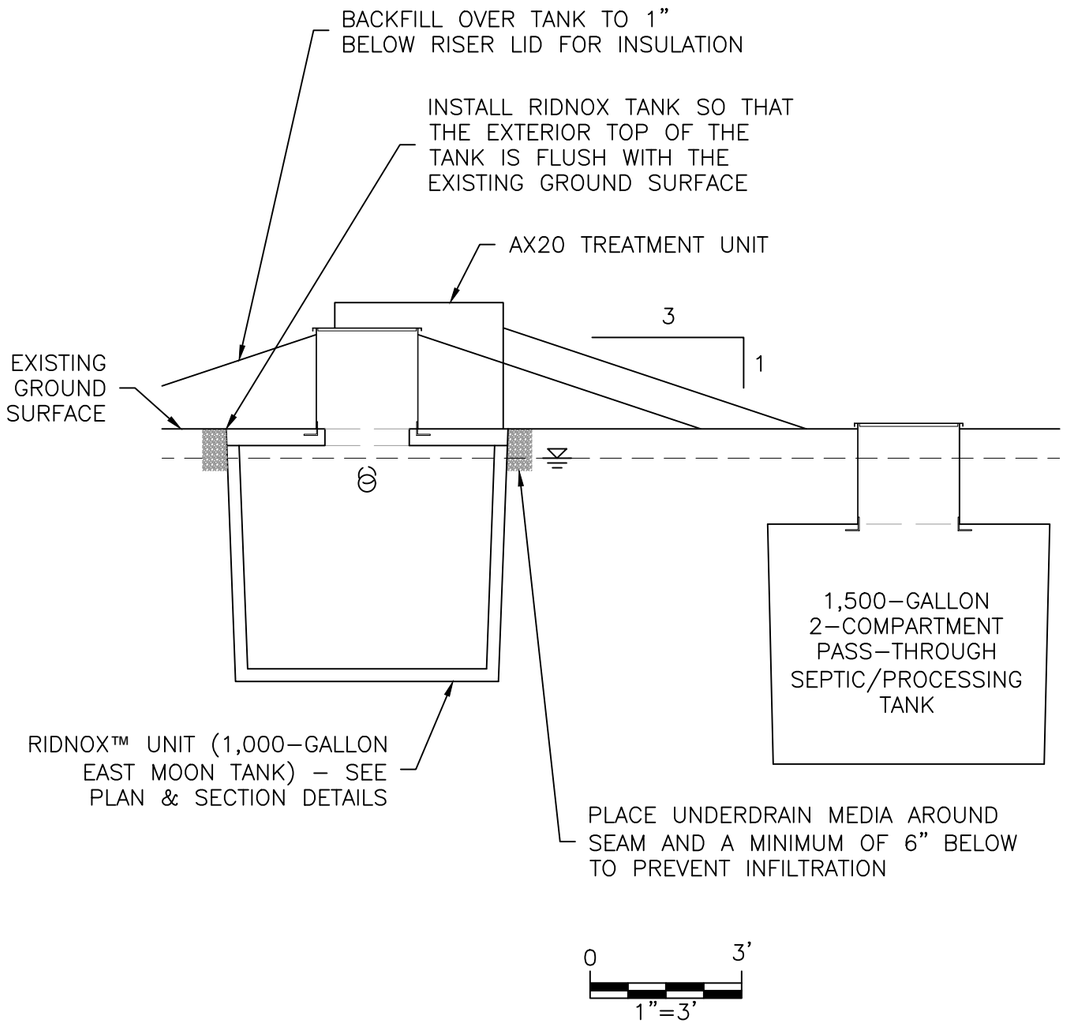

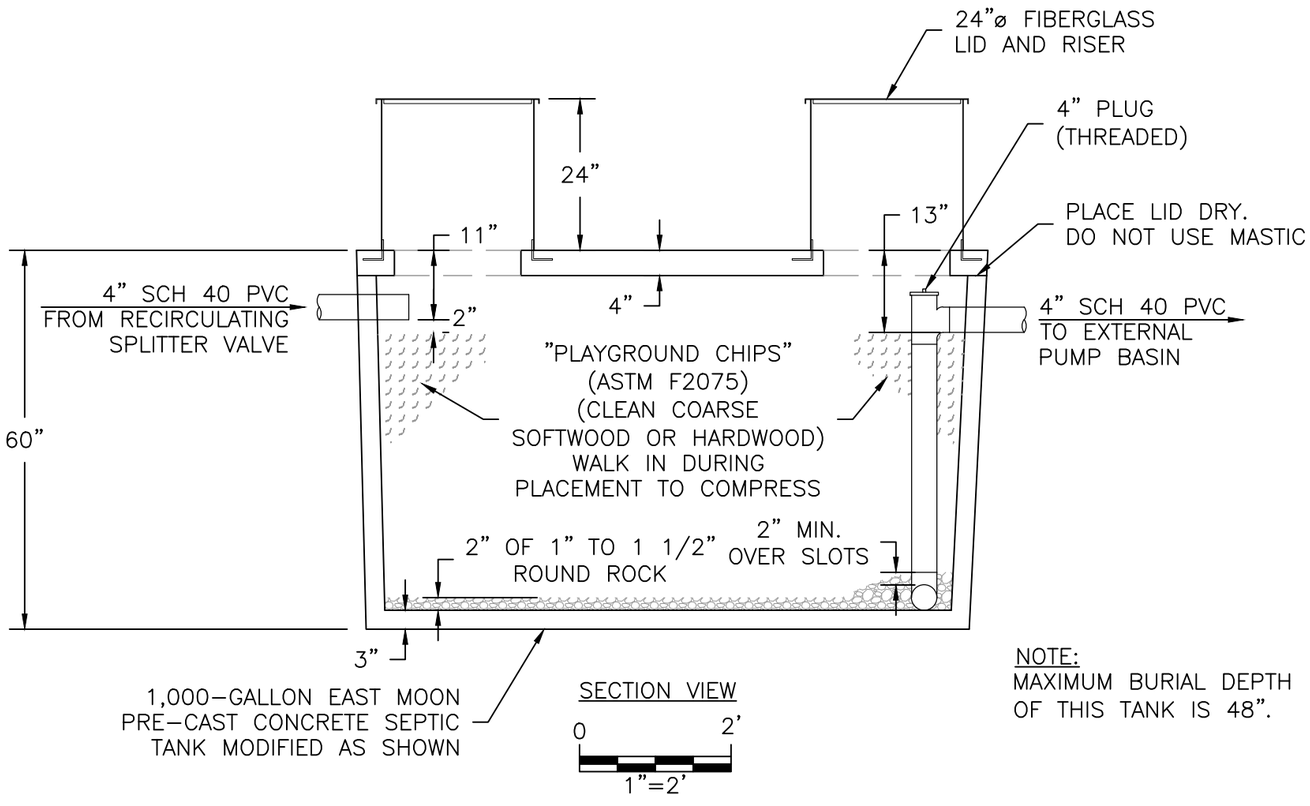

NOTE:
MAXIMUM BURIAL DEPTH OF THIS TANK IS 48".

Figure 6. RidNOx™ Details

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
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COMMUNITY DEVELOPMENT

MEMORANDUM

TO: Oregon Department of Environmental Quality Variance Officer

FROM: Peter Gutowsky, AICP, Director

DATE: August 26, 2025

SUBJECT: Onsite Septic System Variance Application / Groundwater Protection in Southern Deschutes County – 17256 Lodgepole

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I. REQUEST

The Community Development Department (CDD) is concerned about the implications of siting onsite septic systems in Southern Deschutes County through a variance process if future impacts to the aquifer cannot be mitigated. Variance approvals on naturally limited properties that do not meet minimum criteria undermine the goal of protecting a sole source aquifer. It also undercuts our collective efforts and public perception that Deschutes County and the Oregon Department of Environmental Quality (DEQ) are actively protecting the groundwater from nitrate loading.

If DEQ approves an onsite septic system variance for 17256 Lodgepole Lane, CDD respectfully requests documentation describing the basis for it, specifically in relation to Deputy Director Shannon Davis' recent letter to the Deschutes County Board of Commissioners (Board).

II. SITE EVALUATION REPORT

On May 28 and August 5, 2024, Todd Cleveland, Onsite Wastewater Manager, issued a site evaluation report, denying a septic system proposal at 17256 Lodgepole Lane for the following reasons:

- Does not meet minimum separation from the permanent water table (OAR 340-071-0220, 0260, 0265,0275, 0280, 0285, 0290, 0302).
- This property is in management area 18 and is in a known area of groundwater concern. Additional loading from septic system is likely to contaminate the ground water and develop a public health hazard particularly on sites with severely shallow water table. (OAR 340-071-130(1))
- This proposal is to place the final soil absorption bottomless sand filter on the adjacent property, tax lot 6700 or 17262 Lodgepole Lane. Test pits evaluated on this site are better than parcel for the dwelling; however, the pits indicated the water table to rise to at least 18" below the ground surface. Similar issues with loading are present on this parcel.

III. BACKGROUND

On December 19, 2023, Deputy Director, Shannon Davis provided a letter to the Board discussing groundwater pollution concerns from septic systems in Southern Deschutes County. It acknowledged:

- The Sunriver and La Pine area is vulnerable to nitrate contamination from septic systems and private wells are the primary drinking water source for most properties in this area.

- Conditions documented from past investigations and outlined in a U.S. Geological Survey (USGS) factsheet are still valid.

- Testing and research indicate most of the contamination in this region comes from septic systems. This means nutrients from septic systems are seeping into the area's porous, volcanic soil and the aquifer that is used as a primary drinking water source.

- Continued unrestricted development in the area will reach a tipping point that may be difficult or impossible to recover from due to groundwater contamination which will then require additional regulation and funding to address.

- Even with a septic design capable of producing high quality effluent, the treatment may not sufficiently minimize or eliminate nutrients and pathogens from wastewater or future impacts to the aquifer system as outlined by a USGS model.

- Some parcels are not suitable for septic systems.

- DEQ still believes that conditions in South Deschutes County are a potential public health and ecological impact issue.

IV. DEQ VARIANCE PROCESS

As noted in a DEQ Fact Sheet, a variance officer will review the proposal and other application materials, conduct a site visit, consider site-specific conditions, and hold a public hearing. The variance hearing is not an opportunity to overturn the county agent's decision. It is an information gathering hearing. The decision to approve or deny a variance application is based on the information presented in the proposal and the requirements and purpose of DEQ's regulations. For this specific application, a variance officer must consider the cumulative impacts to approve a variance in relation to the conditions that exist in Southern Deschutes County, which as noted above, are at risk of contamination from onsite wastewater treatment systems. Factors include:

- Nitrogen loading from onsite wastewater treatment systems is the primary source of contamination; therefore, reducing loading from existing systems and limiting new additional sources is the simplest method to reduce overall loading. New loading from sites that do not meet minimum requirements for any system must be scrutinized to the greatest extent possible.

- Management area 18 has very little capacity for additional loading and requires the highest level of treatment for existing systems to protect water resources for future beneficial uses. A run of the Nitrate Loading Management Model (NLMM) estimating load in 2006 indicated potential loading for up to 12 residences on high groundwater lots. The proposed location already has an approved system installed under an approved variance. This creates wastewater loading in a relatively localized area on one parcel that was modeled to have no loading.

- Management Area 18 has had only four existing systems upgraded to nitrogen reducing systems, but not the modeled 96% reduction. At least 20 new homes and nitrogen reducing systems have been permitted on lots that met approval after evaluation. A number of these lots were originally modeled as red lots that would never generate loading. Four previous variances have been approved in this management area.

- Management areas without additional capacity must be handled extremely carefully due to the lack of additional capacity. Loading from existing systems is sufficient to cause a significant contamination issue and public health hazard; therefore, existing polluting systems must be addressed first to best protect water resources. Additional loading on sites that were never considered to create loading makes addressing the existing loading more difficult while not protecting water resources from pollution.

Variance Protocol

Date: August 26, 2025
Time: 2:00 PM
Variance Officer: David Hurley

Applicant: Aaron Schwartz & Elizabeth Dantzker

Address: 17074 Cooper Drive
Bend, OR 97707

WQ/O – Variance Assignment 248-25-000238-VAR
T. 20S, R. 11E, Sec. 31B, Tax Lot 6600, 2.03 acres
Site address: 17256 Lodgepole Lane, Bend
Deschutes County

Variance location: **17256 Lodgepole Ln., Bend OR**
Legal description: **T. 20S, R. 11E, Sec. 31B, Tax Lot 6600**
Acreage: **2.03 acres**

Attendance: See attached attendance record sheet and hearing introductory sheet.

Prior to recording start:
This is a public informational gathering hearing and is recorded. I will begin by introducing myself and reading the proposal narrative and exhibits of records submitted by Brian Rabe on behalf of Aaron Schwartz and Elizabeth Dantzker. After completion, I will open it up for any questions or comments.

Good morning, it is now 2:00 pm on Tuesday, August 26, 2025.

My name is David Hurley and I am a Department of Environmental Quality employee assigned as today's variance officer.

(Roll call)

We are conducting a public information hearing regarding at the subject property located at 17256 Lodgepole Lane in Bend owned by Aaron Schwartz and Elizabeth Dantzker. The parcel is approximately 2.03 acres in size via Easement; described as Township 20 South, Range 11 East, Section 31B, Tax lot 6600, in Deschutes County.

I visited the site on August 20, 2025 as required by Oregon Administrative Rule Chapter 340 Division 71 Section 0430 subsection 4.

This is a public information gathering hearing which is being held pursuant to OAR 340-071-0430. This hearing is being held to gather testimony into the record that will demonstrate:

1) Why strict compliance with certain Oregon Administrative Rules is inappropriate for cause, or
2) Why specific physical conditions render strict compliance to rules unreasonable, burdensome, or impractical.

Since this is a public information gathering hearing rather than a contested case hearing, cross-examination of persons providing testimony will not be allowed.

As a variance officer, I may request that a person providing testimony expand upon information submitted into the record. I may also ask questions to clarify the record.

All persons wishing to testify must preface their remarks with their name and affiliation with the variance proposal.

Introduction

Deschutes County denied Site Evaluation 247-24-000432-EVAL for this property on August 5, 2024 because the water table rises to within 24 (8-13) inches of ground surface. This site was also previously denied on September 30, 2004 due to high permanent water table rising within 24" of ground surface.

The site evaluation was denied due to the following reasons:

Does not meet minimum separation from permanent water table (OAR 340-071-0220, 0260, 0265,
0275, 0280, 0285, 0290, 0302).

• Installation of an onsite wastewater system in the area evaluated will likely lead to nitrate pollution of public waters. The Nitrate Loading Management Model indicates this area, Management Area 18, represents a moderate to high risk to groundwater and cannot sustain added loading from high groundwater lots if nitrate levels are to remain below the action level in groundwater over time (Morgan, Hinkle, Weick. USGS. 2007). Groundwater shall be protected from

pollution that could impair existing and future beneficial uses, including domestic drinking water from wells (OAR 340-040-0020).
• Deschutes County may not authorize installation or use of a system that is likely to pollute public waters or create a public health hazard (OAR 340-071-0130(1)).

You are requesting a variance from the following Oregon Administrative Rules:

1) OAR 340-071-0135(1) which states: Coordination with listing of alternative treatment technologies, OAR 340-071-0345 (Alternative Treatment Technologies (ATTs)). Under OAR 340-071-0345 (Alternative Treatment Technologies (ATTs)), DEQ maintains a list of alternative treatment technologies (ATTs) that have been tested by an NSF/ANSI organization that meets the requirements of ISO/IEC 17025 – 2005. The ATT must meet the performance standards and other requirements in OAR 340-071-0345 (Alternative Treatment Technologies (ATTs)). ATTs are usually separate treatment units that are installed in onsite systems. Only listed ATTs may be installed under the siting criteria in OAR 340-071-0345 (Alternative Treatment Technologies (ATTs)). This rule provides a process for approving new or innovative technologies, materials, or designs for various components of onsite systems, such as drainfield products or appurtenances. Add-on treatment units, such as units to remove nitrogen following an ATT or sand filter, may also be approved under this rule. However, DEQ does not intend to approve alternatives to standard systems under this rule. Alternative systems will need to be listed as ATTs under OAR 340-071-0345 (Alternative Treatment Technologies (ATTs)) or approved under new rules in this division.
2) OAR 340-071-0150(4)(a)(B) which states: Approval or denial:
(a) A site must be approved for a system if the site evaluation report documents the following:
(A) The site evaluation report identifies the types of the initial and replacement systems for which the site is approved.
(B) All criteria for approving a specific type or types of systems, as described in this division are satisfied.
3) OAR 340-071-0290(4)(d) which states: Bottomless sand filter. Sites may use a conventional sand filter without a bottom (BSF) if the site meets the criteria in this section and section (3) of this rule. (d) The water table is at least 24 inches below the ground surface throughout the year, and a minimum 24-inch separation is maintained between a water table and the bottom of the sand filter.

I have identified an additional rule that requires a variance:

- OAR 340-071-0130(1) which states: Protection of public waters from public health hazards. An agent may not authorize installing or using a system that is

likely to pollute public waters or create a public health hazard. If, in the judgment of the agent, the minimum standards in this division will not adequately protect public waters or public health on a particular site, the agent must require a system to meet requirements that are protective. This may include but is not limited to increasing setbacks, increasing drainfield sizing, or using an alternative system. The agent must provide the applicant with a written statement of the specific reasons why more stringent requirements are necessary

Variance Description:

Brian Rabe, Elkhorn Consulting LLC, prepared your proposal and system plans to overcome the site limitations through the use of a recirculating textile filter system (AdvanTex AX20N-Mode 3B) prior to discharge through a RidNOx™ post-anoxic tank (solid-phase flow-through filter) and then into a 250 sqft elevated reduced sized Bottomless Sand Filter (BSF) system constructed on a 12-inch bed of sand filter media embedded at least 6 inches into the native soil. The proposal includes deviating from the ATT Mode 3B configuration slightly by not installing UV disinfection because it is assumed that discharging to a bottomless sand filter will meet treatment standard 2 criteria independently of the treatment unit.

Open up for discussion, comments, other input……

Any questions:

My Questions:

Leave room for additional questions

I will now review all of the exhibits and comments entered into the record and will make a decision within 45 days to grant the variance as presented or deny the variance. Approval of the variance may be appealed to the Environmental Quality Commission. Denial of the variance may be appealed in Circuit Court per ORS 183.484.

Last call for anyone wishing to enter testimony.

I then declare the hearing closed (or hold open for _____ days for the submission of additional testimony).

End recording.

Attendance list:

Oregon
Tina Kotek, Governor

Department of Environmental Quality
Eastern Region Bend Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
(541) 388-6146
FAX (541) 388-8283
TTY 711

August 13, 2025

Aaron Schwartz & Elizabeth Dantzker
1017 SE 22nd Ave
Portland, OR 97214

Re: WQ: CAS: Variance Assignment: 248-25-000238-VAR; T.20S; R.11E; Sec. 31B; Tax Lot 6600; Lot 1, Block 8 Lazy River West, 2.03 Acres; Deschutes County.

Dear Aaron Schwartz & Elizabeth Dantzker,

The Department of Environmental Quality is in receipt of your onsite wastewater variance application and proposal. The application has been assigned to me for further action. I plan to hold an information gathering hearing (as provided under OAR 340-71-430) regarding your proposal on **Tuesday, August 26, 2025, at 2:00 pm** at the subject property. Your proposal and system plans have been prepared by Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC. It is my understanding that Mr. Rabe will be present to answer any questions regarding the proposal.

Deschutes County conducted a site evaluation with three test pits at the subject property on September 28, 2004, where a denial was issued for the use of an onsite wastewater system on September 30, 2004. The primary reason for denial was due to the predicted depth to the seasonally high permanent water table being less than 24 inches below the ground surface. Observed conditions associated with saturation that are used to determine water table levels and site suitability were observed less than 24 inches from the ground surface.

Southern Deschutes County has a shallow water table that is typically unconfined in porous pumice soils and is susceptible to contamination from soluble and mobile constituents. The most common constituent of concern is nitrate-nitrogen from septic systems.

The proposal is to overcome the site limitations by installing an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology (ATT) System followed by a reduced sized Bottomless Sand Filter (BSF) system constructed with a reinforced concrete berm. The nitrate-nitrogen is proposed to be further reduced with a post-anoxic RidNOx unit. You are seeking variance from the following Oregon Administrative Rules (OARs):

OAR 340-071-0135(1): which addresses Department of Environmental Quality approval of new or innovative technologies, materials, or designs for onsite systems.

OAR 340-071-0150(4)(a)(B) which states: All criteria for approving a specific type or types of systems, as described in this division are satisfied.

OAR 340-071-0290(4)(d) which states: Bottomless sand filter. Sites may use a conventional sand filter without a bottom (BSF) if the site meets the criteria in this section and section (3) of this rule. (d) The water table is at least 24 inches below the ground surface throughout the year, and a minimum 24-inch separation is maintained between a water table and the bottom of the sand filter.

Sometimes during a hearing, it can be determined that other rules or standards need to be considered in order to finalize a proposal. Should this occur, based on the proposal, site observations, and other considerations, I may or may not proceed with the hearing and my final decision process until further information is provided.

Notice of the hearing will be mailed to the neighboring property owners and to the Deschutes County Onsite Wastewater Division staff, see copy enclosed. However, all persons who wish to attend the hearing are welcome. The hearing will provide an opportunity for you and others to offer additional facts or reasons either in support of or in opposition to the proposal and requested variance to the rules.

Please remember, it is the burden of the applicant to show that strict compliance to the rules or standards are inappropriate, or that special physical conditions render strict compliance with the rules or standards to be unreasonable, burdensome or impractical. Additionally, the applicant needs to provide prudent reasonable justification in how their proposal will still protect both public health and the environment.

Deschutes County Onsite Wastewater Division staff will get a copy of your proposal and will have an opportunity to provide both written and verbal comments on your proposal. Others wishing to review your proposal can contact me.

The Department is committed to accommodating people with disabilities. Please notify DEQ of any special physical or language accommodations needed as far in advance of the hearing date as possible. To make any of these arrangements please contact, David Hurley, at (541) 776-6130 or toll free at (866)-863-6668, or by email at: david.hurley@deq.oregon.gov. People with hearing impairments can call DEQ's TTY at (800)-735-2900.

If you have questions concerning the variance process or hearing arrangements, please give me a call. You may also visit https://ordeq.org/septicvariance for more information about variances.

Sincerely,

David Hurley

David Hurley, REHS
Natural Resource Specialist 4
Variance Officer – Onsite Wastewater Program

cc: Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703
Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814

In Addition, To The Following Adjacent Property Owners:

Shue Revocable Trust, 5737 Doverton Way, Chino Hills, CA 91709
Marshall Homestead, LLC, PO Box 5665, Bend, OR 97708
Zahir Nasratyar & Christina Marlena, 6552 Doral Dr, Huntington Beach, CA 92648
Angela Rinehold, 61188 Sleepy Ct, Bend OR 97702
Blaine & Lisette Hulstrom, 7714 SW Barns Rd # Unit A, Portland, OR 97225
RJL LLC, 1303 SE Armour Rd, Bend, OR 97702
James & Amy Gillian, 60586 Robinette Rd, Saint Helens, OR 97051

Encl. Neighbor Notice

Oregon
Tina Kotek, Governor

Department of Environmental Quality
Eastern Region Bend Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
(541) 388-6146
FAX (541) 388-8283
TTY 711

August 13, 2025

Hearing Date/Time is 2:00 PM on August 26, 2025

Re: WQ: CAS: Variance Assignment: 248-25-000238-VAR; T.20S; R.11E; Sec. 31B; Tax Lot 6600; Lot 1, Block 8 Lazy River West, 2.03 Acres; Deschutes County.

Dear Resident:

Neighbors of yours, Aaron Schwartz & Elizabeth Dantzker, own the property referenced above and herein to be referred to as the "Property", has submitted an application to the Oregon Department of Environmental Quality (DEQ) requesting a "For Cause Variance" from Oregon Administrative Rules regulating Onsite Wastewater Treatment Systems. The Property has been denied due to conditions associated with saturation being within 24 inches of the ground surface.

In the variance application, the applicant's proposal is to install an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology (ATT) System followed by a reduced sized Bottomless Sand Filter (BSF) system with an additional RidNOx unit for nitrate-nitrogen reduction.

For more detail, please review the enclosed variance hearing notice.

A variance to the Oregon Administrative Rules regulating Onsite Wastewater Treatment Systems may be granted if a variance officer finds that:

1. Strict compliance with the rules or standards are inappropriate: or

2. Special physical conditions render strict compliance unreasonable, burdensome or impractical.

Part of the variance process involves an information gathering hearing. In this hearing, information is shared about the site conditions, rule requirements, public health or environmental protection concerns, and how the proposed system design overcomes these concerns. It is also an opportunity for all parties involved, including adjacent property owners, to voice any concerns they might have with the proposal. Department policy requires a variance officer to inform all adjacent property owners of the variance hearing date, time and place. You are **not** required to attend this hearing, but can, should you desire to do so.

The information gathering hearing for this variance proposal is to begin at **2:00 PM, Tuesday, August 26, 2025,** at the subject property.

The Department is committed to accommodating people with disabilities. Please notify DEQ of any special physical or language accommodations needed as far in advance of the hearing date as possible. To make any of these arrangements please contact, David Hurley, at (541) 776-6130 or toll free at (866)-863-6668, or by email at: david.hurley@deq.oregon.gov. People with hearing impairments can call DEQ's TTY at (800)-735-2900.

If you have any questions concerning this variance process or hearing arrangements, please give me a call.

Sincerely,

David Hurley, REHS
Natural Resource Specialist 4
Variance Officer – Onsite Wastewater Program

cc: Todd Cleveland, REHS; Deschutes County Onsite Wastewater Division, 117 NW Lafayette Ave, Bend OR 97703
Brian T. Rabe, CPSS, WWS; Principal Soil Scientist, of Elkhorn Consulting LLC, 14833 Goodrich Creek Lane, Baker City, OR 97814

In Addition, To The Following Adjacent Property Owners:

Shue Revocable Trust, 5737 Doverton Way, Chino Hills, CA 91709
Marshall Homestead, LLC, PO Box 5665, Bend, OR 97708
Zahir Nasratyar & Christina Marlena, 6552 Doral Dr, Huntington Beach, CA 92648
Angela Rinehold, 61188 Sleepy Ct, Bend OR 97702
Blaine & Lisette Hulstrom, 7714 SW Barns Rd # Unit A, Portland, OR 97225
RJL LLC, 1303 SE Armour Rd, Bend, OR 97702
James & Amy Gillian, 60586 Robinette Rd, Saint Helens, OR 97051

Encl. Variance Hearing Notice

ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

June 30, 2025

Variance Officer
Onsite Variance Program
DEQ - Eastern Region Water Quality
475 NE Bellevue, Ste. 110
Bend, Oregon 97701

SUBJECT: Formal Variance Request – Aaron Schwartz and Elizabeth Dantzker – T20S, R11E, Section 31B, Tax Lot 6600 (2.03 acres) via Easement on Tax Lot 6700, Deschutes County, South of Bend, Oregon.

Dear Variance Officer:

A formal variance from selected onsite rules is hereby requested under the provisions of Oregon Administrative Rules, Chapter 340, Division 071, Section 0415 (OAR 340-071-0415).[1] The property is located at 17256 Lodgepole Lane, south of Bend in Deschutes County, Oregon (Site) (Figure 1) and consists of 2.03 acres. A Tax Lot map is attached in Appendix A and a copy of the Deed is attached in Appendix B.

Background

The site was approved for a standard system in 1976. However, since there were no details in the file regarding the soil conditions, or a site plan showing the approved area, this approval could not be honored. Deschutes County conducted a new site evaluation on May 28, 2024, and a denial was issued on June 3, 2024. The denial was based on conditions associated with saturation noted at a depth of 6 to 10 inches below the ground surface (bgs) in 4 test pits located in the southern part of the parcel. Two additional test pits were evaluated on July 24, 2024, and a denial was issued on August 5, 2024. These test pits were in the northwestern part of the parcel with conditions associated with saturation noted at a depth of 8 to 13 inches bgs. A copy of the site evaluation documentation from Deschutes County is attached in Appendix C. The primary reasons cited for the denial were the predicted depth to the highest level attained by a fluctuating permanent water table and the risk to groundwater quality that could result from increased nitrogen loading to the underlying aquifer. A copy of the site evaluation documentation from Deschutes County is attached in Appendix C.

The adjacent lot to the east (Tax Lot 6700) was evaluated by Deschutes County on September 28, 2004, and a denial was issued on September 30, 2004. The evaluation included a total of 5 test pits, one about 50 feet north of the middle of the southern boundary, one near the southeast corner, and the other 3 spaced along the eastern boundary. The test pits were described with indications of a seasonally high permanent water table at between 6 and 19 inches below the existing ground surface (bgs) with the wetter conditions observed in the northern pits and the better conditions observed in the southern pits. A variance was applied for and granted in 2022 in the southeastern corner of Tax Lot 6700 between Test Pits 1 and 2 from the 2004 evaluation. The area immediately west of the 2022 variance approval was evaluated and found to be similar in elevation and there is enough room to accommodate a second

[1] Onsite wastewater treatment systems, 340 OAR § 340.71. (2020).

pair of modified bottomless sand filters with ample area for an easement encumbering Tax Lot 6700 for the benefit of Tax Lot 6600 that meets all applicable horizontal setbacks.

Soils

The web soil survey shows the location of the Site and a copy of the output is provided in Appendix D. The entire parcel is shown within a delineation of Map Unit 115A, Shanahan loamy coarse sand, low, 0 to 3 percent slopes. Shanahan soils are described as very deep, somewhat excessively drained soils that formed in ash (pumice) over old alluvium. The typical profile generally consists of the following:

- Up to 1 inch of organic material underlain by,
- 4 inches of very dark grayish brown paragravelly ashy loamy coarse sand underlain by,
- 4 inches of dark brown paragravelly ashy coarse sand underlain by,
- 7 inches of brown paragravelly ashy coarse sand underlain by,
- 11 inches of light olive brown and light yellowish brown ashy coarse sand underlain by,
- 19 inches of brown fine sandy loam underlain by,
- 15 inches of brown extremely cobbly fine sandy loam.

The Shanahan series is not expected to have a water table within 80 inches of the surface.

The characteristics observed at the Site are reasonably similar to the associated Sunriver series that is expected to have a water table that rises to approximately 2 to 4 feet bgs from April to June. The primary differences between the conditions noted in the 2004 soil notes and the published soil survey are related primarily to coloration (browner colors) in the surface horizons that are more indicative of the Shanahan series.

Preliminary Assessment

The Site was reviewed by Brian Rabe, CPSS, WWS, on June 4, 2025. The purpose was to review the Site conditions and assess the potential to design a modified bottomless sand filter that incorporates additional fill to create adequate separation from the underlying water table following advanced secondary treatment meeting the criteria for Treatment Standard 2 (TS2). The proposed bottomless sand filter area is located on this highest ground, represented by Test Pit 1 in the 2004 site evaluation (southern part of Tax Lot 6700 via a proposed easement - see Figure 2 and Appendix C).

Other Considerations

This parcel and developed parcels in the surrounding area are served by individual private wells. A search of the database of the Oregon Department of Water Resources was conducted for the section that the subject property lies within (Section 31 of Township 20 South, Range 11 East of the Willamette Meridian). There are about 161 records on file for this section. A total of 6 water well records (well logs) were identified in Section 31 that could be tied to specific parcels within about one-

eighth of a mile of the subject property (Appendix E). The closest wells in each direction are described below.

The nearest well that could be identified is on Tax Lot 6700 about 190 feet north of the proposed bottomless sand filter area and was completed on February 19, 2025, to a depth of 223 feet. Water was described as being first found at a depth of 222 feet in a layer of "pumice and black rock" and had a static water level of 23 feet bgs on the date of completion with a reported yield of 25 gpm with 6 feet of drawdown after 3 hours with a pump.

The next closest well that could be identified is on Tax Lot 6800 about 200 feet north-northeast of the proposed bottomless sand filter area. This well was completed on September 21, 1981, to a depth of 70 feet. Water was described as being first found at a depth of 50 feet in a layer of "white pumice" and had a static water level of 12 feet bgs on the date of completion with a reported yield of 6 gpm with 32 feet of drawdown after 72 hours with a pump.

The next closest well is on Tax Lot 6900 about 420 feet east-northeast of the proposed bottomless sand filter area and was completed on May 24, 1979, to a depth of 63 feet. Water was described as being first found at a depth of 43 feet in a layer of "clay-hard and dry" and had a static water level of 22 feet bgs on the date of completion with a reported yield of 16 gpm with 30 foot of drawdown after 8 hours with a pump. There is likely a transcription error on this report since it is unlikely that a hard dry clay would yield water, and more likely to have been encountered in the layer below, starting at a depth of 53 feet, that was described as consisting of "gravel-fine with sand."

The well for Tax Lot 4400 is about 460 feet southeast of the proposed bottomless sand filter area and was completed on August 23, 2011, to a depth of 229 feet. Water was described as being first found at a depth of 5 feet in a layer of "gravel" and had a static water level of 5 feet bgs with an estimated yield of 7 gpm. This layer was sealed off. A second water bearing zone was described beginning at a depth of 55 feet in a layer of "gray ash" and had a static water level of 20 feet bgs with an estimated yield of 20 gpm. A third water bearing zone was described beginning at a depth of 225 feet bgs in a layer of "white pumice" with a reported yield of 25 gpm with 6 feet of drawdown after 2 hours with a pump.

The previous well for Tax Lot 4400 is about 490 feet southeast of the proposed bottomless sand filter area and was completed on March 12, 1996, to a depth of 27 feet. Water was described as being first found at a depth of 3 feet in a layer of "sand gravel mud" but that was sealed off. A second water bearing zone was described beginning at a depth of 19 feet in a layer of "fine sand brown" and had a static water level of 3 feet bgs on the date of completion with a reported yield of 4 gpm with 20 feet of drawdown after 4 hours with a pump.

The well for Tax Lot 4700 is about 580 feet south-southwest of the proposed bottomless sand filter area and was completed on January 12, 2018, to a depth of 208 feet. Water was described as being first found at a depth of 9 feet in a layer of "gravel" and had a static water level of 8 feet bgs with an estimated yield of 5 gpm. That layer was sealed off. A second water bearing zone was described beginning at 207 feet in a layer of "coarse pumice" and had a static water of 15 feet bgs on the date of completion with a reported yield of 18 gpm with 34 feet of drawdown after 2 hours with a pump.

The regional groundwater gradient, as indicated in a study published by the U.S. Geological Survey, is to the east-northeast toward the Deschutes River.[2] The subject property is located within Management Area 18, which recommends a 79% to 100% reduction from the base scenario loading (standard systems) for existing and future homes. The results of the Nitrate Loading Management Model within the study (Figures 25 and 26) suggest that this area represents a moderate to high risk of adverse impacts to groundwater quality. According to the interactive map for Oregon Domestic Well Testing, this part of Deschutes County has an average nitrate-nitrogen concentration in domestic wells of 1.71 milligrams per liter (mg/L) with 18.83% exceeding 3 mg/L and 1.17% exceeding 10 mg/L (based on 1,200 test results, viewed on June 22, 2025).[3]

Formal Variance Request

Variance is requested from the following rules:

1. OAR 340-071-0135(1) – which addresses Department of Environmental Quality (DEQ) approval of new or innovative technologies, materials, or designs for onsite systems.[1]
2. OAR 340-071-0150(4)(a)(B) – which requires all criteria for approval shall be met.[1]
3. OAR 340-071-0290(4)(d) – which states that the water table is at least 24 inches bgs throughout the year.[1]

This request seeks to overcome the limitations of this Site by treating the sewage using a recirculating textile filter system (AdvanTex® AX20N-Mode 3B) prior to discharge into an elevated bottomless sand filter. AdvanTex units do an effective job of reducing five-day biochemical oxygen demand and total suspended solids to below 10 mg/L. Nitrogen is often fully converted from ammonia-nitrogen to nitrate-nitrogen (greater than 90%). Operating in Mode 3, the AdvanTex unit reduces total nitrogen sufficiently to meet TS2 (less than 30 mg/L). The DEQ approval of the AX20N in Mode 3B includes an ultraviolet light to satisfy the pathogen reduction requirements of TS2. However, this request includes the use of a modified bottomless sand filter to achieve the pathogen reduction requirements of TS2 instead of an ultraviolet light and, therefore, this configuration does not have (or need) an ultraviolet disinfection unit. The "B" designation indicates the AdvanTex unit is configured with the second pump for the final discharge to the modified bottomless sand filter. A post-anoxic treatment process (RidNOx™) is proposed to reduce the total nitrogen concentration in the final effluent pumped to the modified bottomless sand filter to less than 2 mg/L.

The AX20 systems in the La Pine project produced effluent with an average total nitrogen (TN) concentration of 17 mg/L. A post-anoxic process similar to the RidNOx unit that is proposed, referred to at the time as Nitrex, was tested following treatment through a lined intermittent sand filter. The Nitrex unit consisted of a 2-compartment concrete tank filled with what was described as a proprietary carbon media (wood chips).

[2] Morgan, D. S., & Hinkle, R. S. (2007). *Evaluation of approaches for managing nitrate loading from on-site wastewater systems near La Pine, Oregon*, (Scientific Investigations Report 2007-5237). Reston, VA: U.S. Geologic Survey.

[3] ARC GIS Online. (n.d.). Oregon domestic well testing, [Data file]. Retrieved June 22, 2025, from ARC GIS Online: https://www.arcgis.com/apps/MapSeries/index.html?appid=c0d7daea497049c1a686d07dab7106e5

The sand filters in the La Pine project produced an average TN of about 50 mg/L and the final effluent from the Nitrex units had an average TN of 2.4 mg/L, representing a 96% reduction from the 60 mg/L average TN concentration in the septic tank effluent. So long as there is sufficient soluble carbon being released from the wood chips, and the hydraulic loading rate is low enough to allow the dissolved oxygen in the effluent to approach zero, the NO_3-N concentration will typically be below the method detection limit. What nitrogen remains in the effluent will often be organic, as measured by the Total Kjeldahl Nitrogen (TKN) method. The organic nitrogen may be subsequently oxidized in the bottomless sand filter but is just as likely to be retained or recycled in the biomass that develops in the sand filter media. Therefore, the concentration of nitrogen leaving the bottomless sand filter after treatment through both the AX20 and the RidNOx unit is expected to be even lower than the results from the La Pine project.

The RidNOx unit described in this proposal is configured similar to larger units used on several systems permitted under Water Pollution Control Facilities (WPCF) permits and monitored on a regular basis. Some of these units have been in tanks and some have been in lined basins. Typical results from the post-anoxic process (prior to discharge, typically to a soil absorption system) include NO_3-N concentrations near or below the method detection limit and TKN concentrations between 1 and 3 mg/L.

The test results (August 2022) from a similarly configured system (predominantly residential sources using AdvanTex treatment with Mode 3-style pre-anoxic denitrification, followed by post-anoxic treatment in tanks filled with wood chips) produced a TKN concentration of 0.68 mg/L and a NO_3-N concentration of 0.13 mg/L for a TN of 0.81 mg/L.

The test results (July 2022) from a high-nitrogen source (150 mg/L TKN treated by AdvenTex with alkalinity augmentation to support full nitrification, configured in a Mode 3-style pre-anoxic process, followed by post-anoxic treatment in lined wood-chip beds) produced a TKN concentration of 0.99 mg/L and a NO_3-N concentration of 0.05 mg/L for a TN of 1.04 mg/L. Assuming a maximum 65 to 75% reduction from the starting concentration, the NO_3-N concentration entering the post-anoxic process is expected range between 40 and 45 mg/L, similar to the sand filter effluent from the La Pine Project and higher than what is expected from the AX20 in a residential scenario.

Based on the performance of the commercial systems described above, and a typical residential TN concentration of 60 mg/L, an average TN concentration in the AX20 effluent of 17 mg/L, the TN concentration leaving the RidNOx unit and going to the modified bottomless sand filter, the typical reduction from the base scenario presented in the groundwater study cited previously is expected to be approximately 97 percent.

The initial and replacement bottomless sand filter areas are proposed on the highest ground in the southern part of Tax Lot 6700 near Test Pit 1 (2004). This represents an area with the appropriate spatial footprint and meets all required horizontal setback requirements. Test Pit 1 (2004) was described as:

- Very dark grayish brown (10YR 3/2) loamy coarse sand from 0 to 5 inches, structureless (single grain), loose, with many very fine, fine, medium, and large roots; underlain by,
- Brown (10YR 4/3) coarse sand from 5 to 24 inches, structureless (single grain), loose, with few fine roots, with few fine faint light gray (10YR 7/2) and few fine distinct black (10YR 2/1) depletions described beginning at 18 inches; underlain by,
- Dark grayish brown (10YR 4/2) fine sandy loam from 24 to 44 inches, with moderate medium subangular blocky structure, no roots, and redoximorphic features (iron concentrations) throughout underlain by,
- Very dark gray (10YR 3/1) very gravelly sand from 44 to 80 inches (40% gravel), structureless (single grain), no roots, and redoximorphic features throughout. Water was described at a depth of 80 inches on the date of the evaluation (September 28, 2004).

A supplemental test pit was excavated on June 4, 2025, adjacent to the lowest corner of the proposed bottomless sand filters and was described by Brian Rabe as:

- Very dark grayish brown (10YR 3/2) loamy sand from 0 to 10 inches with dark yellowish brown (10YR 4/6) pumice, weak fine subangular blocky structure to structureless (single grain), loose, with many medium, fine, and very fine; underlain by,
- Dark brown (10YR 3/3) loamy sand from 10 to 18 inches with yellowish brown (10YR 5/6) pumice, weak fine subangular blocky structure to structureless (single grain), loose, with common medium, fine, and very fine roots; underlain by,
- Dark brown (10YR 3/3) loamy sand from 18 to 22 inches with yellowish brown (10YR 5/6) pumice, with weak subangular blocky structure to structureless (single grain), with common fine and very fine roots, and very faint redoximorphic features (iron stripping and concentrations) throughout; underlain by,
- Very dark grayish brown (10YR 3/2) sandy loam with 10 percent gravel from 22 to 40 inches, with weak subangular blocky structure to structureless (massive), few fine roots, and faint redoximorphic features (iron stripping and staining) throughout; underlain by
- Black (10YR 2/1) sand from 40 to 54 inches, structureless (single grain), no roots.

Relative elevation measurements were made at all 4 corners of both the proposed initial and replacement bottomless sand filters as well as at the existing ground surface adjacent to the supplemental test pit (2025). The highest level of the water table is expected to be 18 inches below the existing ground surface at the lowest point within the area proposed for the initial and replacement sand filters based on a depth of 18 inches to the redoximorphic features described in the supplemental test pit (2025) and Test Pit 2 (2004).

The proposed system seeks to overcome this limitation by elevating the modified bottomless sand filter in a manner that provides an additional 3 inches of separation (Figure 3). The sod and underlying sandy soil to a depth of 6 inches within the footprint of the sand filter will be excavated and replaced with sand filter media. An additional 7 inches of sand filter media (total of 13 inches) will be used to exceed the minimum 24-inch separation from shallowest water table depth standard by providing a total separation of 27 inches for the initial system. The replacement will include an additional 9 inches of sand (total of 15 inches) of sand filter media to achieve the same degree of separation from the shallowest water table depth. The rest of the sand filter will be "conventional" from there up, consisting of 6 inches of underdrain media, 24 inches of sand filter media, 6 inches of drain media (with the distribution laterals), filter fabric, and 6 to 9 inches of backfill.

Brian Rabe will need to be involved during the construction of this system to install the lysimeter in the sand filter and oversee the installation of the RidNOx unit. Additional information regarding the installation of the RidNOx unit and the lysimeter, as well as sampling instructions, are described in Appendix F and shown in Figures 4, 5, and 6. The owner agrees to facilitate sampling of the RidNOx effluent in conjunction with routine service visits (twice per year for the first 2 years and annually thereafter) to monitor the performance. Samples will be collected from the pump basin between the RidNOx unit and the sand filter. When the media begins to show signs of depletion (as indicated by average nitrogen concentrations climbing to above 7 mg/L nitrate-nitrogen or 10 mg/L total nitrogen), the owner will schedule media replacement for the following summer when the water table is at least 30 inches below the top of the tank (to prevent displacement of the empty tank by buoyant forces). If this request is approved, a condition of approval will require access be allowed to the treatment system and sand filter by current and future property owners for periodic sampling.

In addition to the high level of treatment achieved by the AdvanTex treatment system and post-anoxic denitrification process, further treatment of the effluent will occur with predominantly unsaturated flow within the imported sand and native sandy soil beneath the bottomless sand filter (minimum of 24 inches above the highest predicted level of the underlying fluctuating water table). Small doses, coupled with substantial resting periods achieved with pressure distribution (see recommended sand filter plan detail in Figure 4), will ensure unsaturated, thin-film flow through the soils above the water table. This will further reduce pathogens and other residual contaminants. The subsoil found beneath the sandy surface soils include evidence of both oxidation and reduction of iron. Conditions that support the reduction of iron will reduce nitrate-nitrogen to nitrogen gas since nitrate ions are used as electron acceptors preferentially over iron compounds. This will facilitate additional reduction of nitrate-nitrogen as the highly treated effluent is assimilated into the environment.

Additional Considerations for No Net Impact to Groundwater Nitrate Contribution

A letter from the Deputy Director of the Oregon Department of Environmental Quality dated December 19, 2023, to the Deschutes County Commissioners formally focused additional attention on the potential impacts to water quality in southern Deschutes County from onsite sewage treatment systems. It is important to consider a number of very conservative assumptions that were made in the USGS groundwater modeling effort that likely overestimated the potential impacts. The following addresses a few specific examples.

Plant Uptake of Nitrogen

The model specifically assumes no nitrogen removal from plant uptake. This may be appropriate for shallow rooted grasses, forbes, and other understory vegetation (e.g., bitterbrush). However, this is not appropriate for the overstory vegetation which is primarily lodgepole and ponderosa pine. These tree species have deeper root systems that can withstand periodic saturation. The model accounted for the impact of transpiration in the water balance but did not account for the impact of nutrient removal and storage in the nitrogen balance. The study concluded that there would be a concentration effect as a result. However, this is not realistic. Plants do not take up water without taking up nutrients that they need, if they are present.

Although studies of nutrient removal by lodgepole pine are limited, there are data available from peer-reviewed journal articles. One such article (T.J. Fahey, 1985)[4] documented total nitrogen uptake of 1.25 grams per square meter (g/m^2) with root turnover of 0.37 g/m^2 for a net uptake of 0.88 g/m^2. This corresponds to 7.85 pounds of nitrogen uptake per acre per year.

Another data source is a chapter from a publication by the United States Forest Service (USFS) which states that the pumice soils in the area are "very severely deficient" in nitrogen (Shainsky, 1992)[5]. Table 4 of that publication lists the average nitrogen concentrations for several components of the tree. Since yield estimates in the published soil survey are focused on the volume of merchantable wood produced over the typical rotation of a stand of timber, only the concentrations of the bolewood (0.06% N) and bark (0.25% N) are accounted for (the parts removed during harvest). The crowns, stumps, and roots are not removed during harvest and would contribute to nutrient cycling on site. The estimated yield of lodgepole pine for Shanahan soils in the published soil survey is 65 cubic feet per acre per year ($ft^3/ac/yr$). The dry density of lodgepole pine ranges from 22 to 53 pounds per cubic foot (lb/ft^3). For the purpose of calculation, an average of 37.5 lb/ft^3 will be used.

The smallest lots eligible for development in southern Deschutes County are about 0.5 acres in size. However, in this instance, the lots (both Tax Lot 6600 and 6700) are shown on Dial to be 2.03 acres

[4]T.J. Fahey, e. a. (1985). The Nitrogen Cycle in Lodgepole Pine Forests, Southeast Wyoming. *Biogeochemistry*.

[5] Shainsky, S. N. (1992). *Distribution of Biomass and Nutrients in Lodgepole Pine/Bitterbrush Ecosystems in Central Oregon.* USFS Deschutes National Forest.

in size and have extensive tree cover. It is assumed that less than half of each lot will be developed (home, outbuildings, driveway, yard, etc.) and the other half will be maintained with native trees (lodgepole and/or ponderosa pine). Assuming half the average annual growth (32.5 ft^3/ac/yr), an average density of 37.5 lb/ft^3, and the nitrogen content described previously, the annual amount of N taken up and stored in standing wood biomass on 1 acre (one half of each 2-acre lot) is 4.8 pounds.

As described in the variance proposal, the proposed system represents the best currently available technology (AdvanTex + RidNOx + MBSF), which is expected to be comparable or better than the best system studied in the La Pine Demonstration Project (Sand Filter + Nitrex + Drainfield). Using expected average total nitrogen concentrations in the effluent leaving the bottomless sand filter after secondary treatment through AdvanTex unit in Mode 3B, followed by tertiary treatment through the RidNOx unit, and the data presented in the USGS groundwater loading and modeling study, the annual mass load to groundwater would be 0.7 lb N/yr (2 mg/L x 2.55 people per home x 45 gallons per person per day x 365 days per year). Even the conservative nitrogen uptake and retention from residual trees on this lot is greater than the contribution from the proposed system. Therefore, approval of this lot utilizing this treatment approach is not likely to make an additive contribution of nitrogen to groundwater.

Hydraulic Loading

The annual hydraulic contribution to groundwater (precipitation minus evapotranspiration) is based on the natural condition. As development occurs, the transpiration component is reduced by the amount of area covered in roofs, driveways, and other impervious or non-vegetated areas. Runoff is limited in these soils so a higher proportion of precipitation contributes to recharge on developed lots than was assumed in the model. This would have a slight positive impact on resulting concentrations.

The letter from the Deputy Director states that the credibility of the state and county could be called into question regarding protection of water quality if more variances are approved. I respectfully disagree, based on the data provided in the previous paragraphs. Use of systems that further reduce the contribution to groundwater, with some systems under certain conditions representing a net zero contribution in most situations, and a net negative contribution in areas with slightly elevated (or higher) nitrate concentrations, are protective of groundwater quality and public health. These systems are only currently available through the variance process.

Conclusions

As described, the proposed combination of treatment components is expected to produce a final effluent with very high quality and a low potential to impact water quality, human health, or the environment. Given the unique circumstances at this Site, strict compliance with the rules is considered to be unreasonable.

It is acknowledged that detailed plans and specifications will need to be submitted and approved before any construction can take place. It is also understood that if this request is approved, there will be language included that allows the county to allow or require a prescriptive system that is demonstrated to perform equal to or better than what is described in this proposal.

Directions to the Site as well as a map showing the ownership of adjacent parcels along with a list of names and addresses are attached in Appendix G. If you have any questions or comments, please do not hesitate to contact me directly at (503) 881-1604.

Sincerely,
ELKHORN CONSULTING LLC

Brian T. Rabe, CPSS, WWS
Principal Soil Scientist

BTR/ddr
Enc: Figures 1-6, Appendices A-G
c: Aaron Schwartz and Elizabeth Dantzker
Todd Cleveland, REHS – Deschutes County

CPSS
Certified Professional
Soil Scientist
BRIAN T. RABE
15239 Exp. 31DEC25
Registered Wastewater Specialist
No. EH-W-448430 Exp. 30SEP25

FIGURES

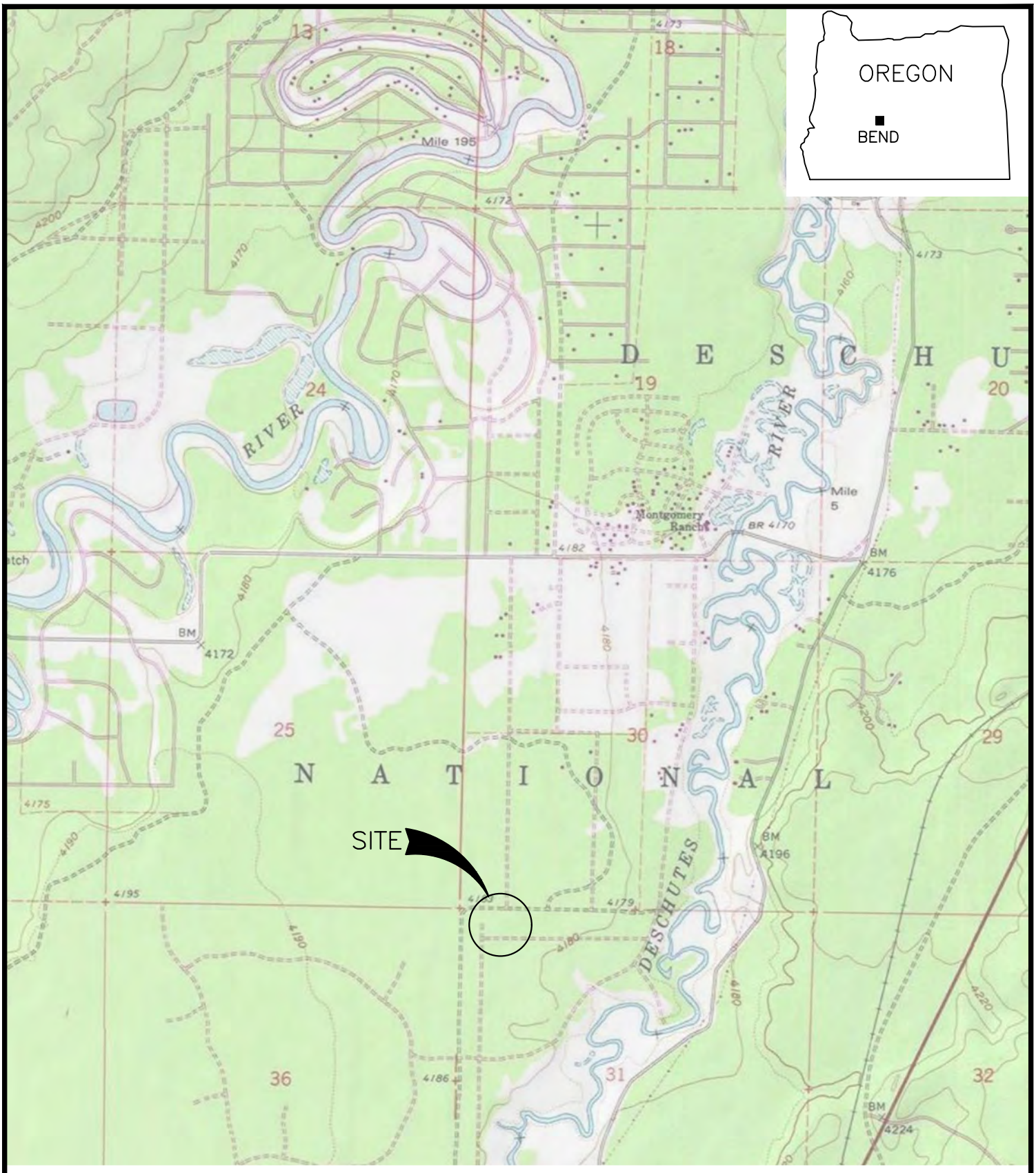

Figure 1. Vicinity Map

0 2,000'

1" = 2,000'

(LOCATIONS AND SCALE ARE APPROXIMATE)

(SOURCE: ©2013 National Geographic Society, i-cubed)

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DATE: 6/30/2025	
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker 17256 Lodgepole Lane Bend, OR 97707
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

G:\Documents\Elkhorn Consulting\Projects\2025\2025003 Schwartz\Drafting\DWG\2025003 F1-6.dwg June 30, 2025 DRABE

TAX LOT 1400 APPROVED (1979)
WILL NOT BE HONORED

HOMESTEAD WAY

TAX LOT 1301 APPROVED (1982)
BOTTOMLESS SAND FILTER – INSTALLED (1989)

LIVELY LANE

N

T20S, R11E, SECTION 31B, TAX LOT 6600

220'

TAX LOT 6700
APPROVED (1976) DENIED (2004)
VARIANCE ATT + CARBON–ENHANCED MBSF
(APPROVED 2022, INSTALLED 2025)

TAX LOT 6800
NO RECORDS
(RECORDS ON DIAL ARE FOR
NEXT LOT TO THE EAST)

TAX LOT 6500
DENIED (2022)

100'

PROPOSED WELL

50'

WELL

50'

PROPOSED SHOP (40'x60')

405'

405'

CLEANOUTS

HOUSE

5' MIN

PROPOSED HOUSE (50'x50')

PROPOSED 10'X25' MODIFIED BOTTOMLESS SAND FILTER

PROPOSED EASEMENT BOUNDARY
(FROM TAX LOT 6700
TO TAX LOT 6600)

TEST PIT 1 (2004)

TEST PIT 2 (2004)

55'

PROPOSED GARAGE (25'x32')

48'

10'

R

I

15'

TBM – TOP OF IRON ROD

5' MIN

220'

12'

55'

SUPPLEMENTAL TEST PIT (2025)

PROPOSED 10'X25' REPLACEMENT AREA

LODGEPOLE LANE
(17256)

TAX LOT 6400
NO RECORDS

TAX LOT 6300
NO RECORDS

TAX LOT 4600
ATT + BSF (2022)

TAX LOT 4400
BOTTOMLESS SAND FILTER (1997)

0 60'

1"=60'

(SCALE AND LOCATIONS ARE APPROXIMATE)

Figure 2. Site Plan

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DATE: 6/30/2025	
DWG NO: 2025003 F1–6.DWG	Aaron Schwartz and Elizabeth Dantzker 17256 Lodgepole Lane Bend, OR 97707
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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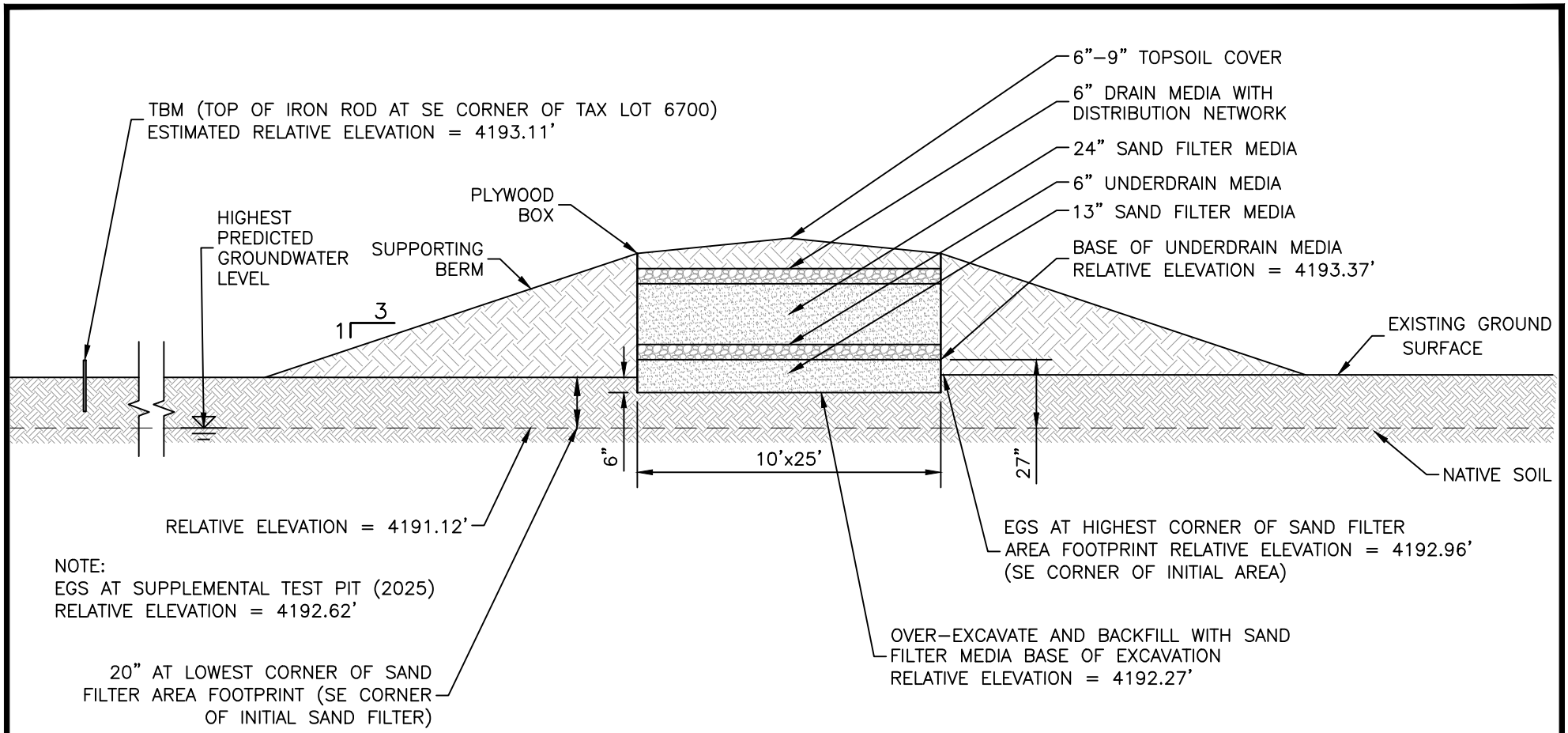

Figure 3A. Modified Bottomless Sand Filter Section – Initial

0 5'

1"=5'

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1–6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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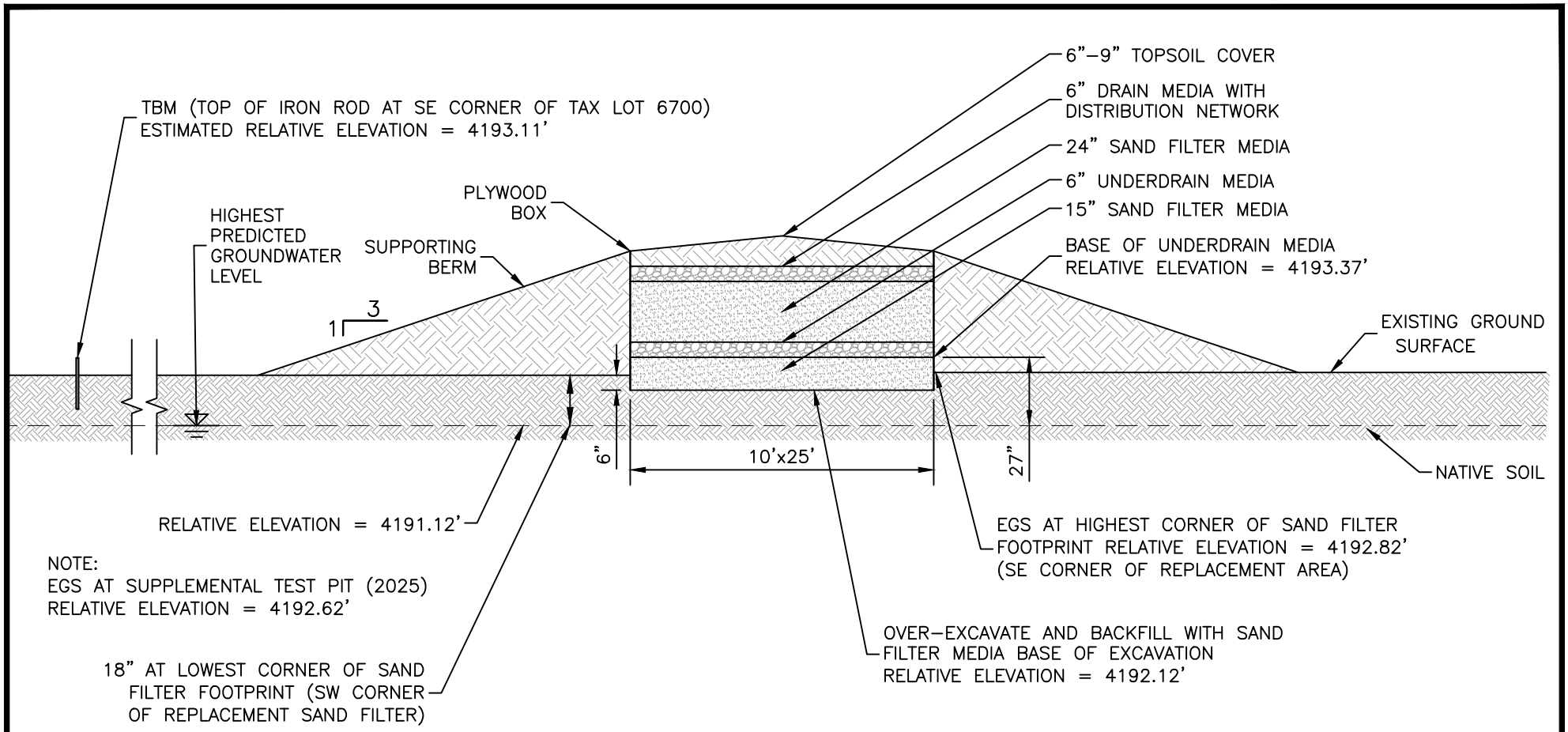

Figure 3B. Modified Bottomless Sand Filter Section – Replacement

0 5'

1"=5'

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1–6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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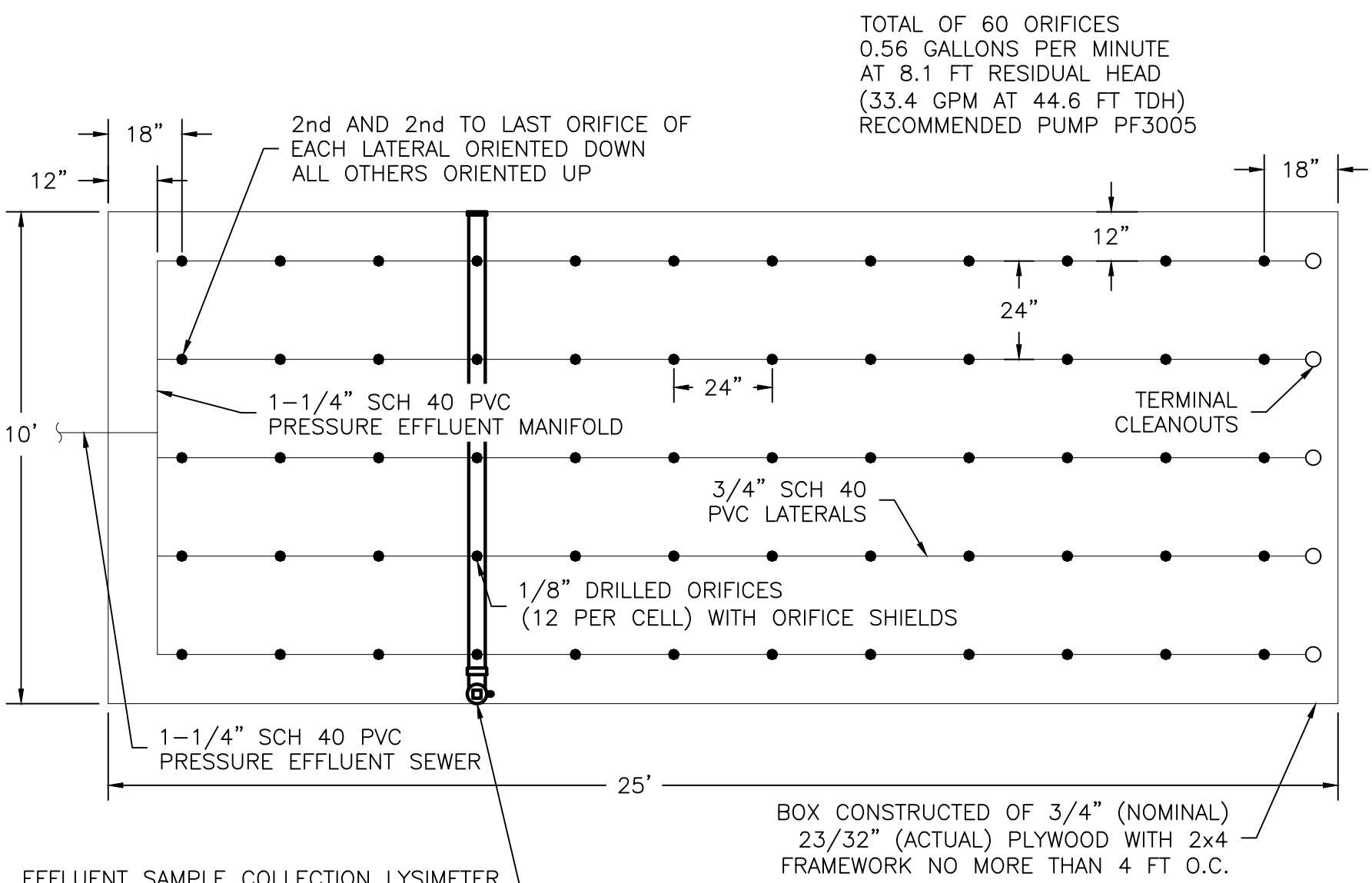

Figure 4. Sand Filter Plan Detail

PROJECT NUMBER: 2025003	Formal Variance T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DATE: 6/30/2025	
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker 17256 Lodgepole Lane Bend, OR 97707
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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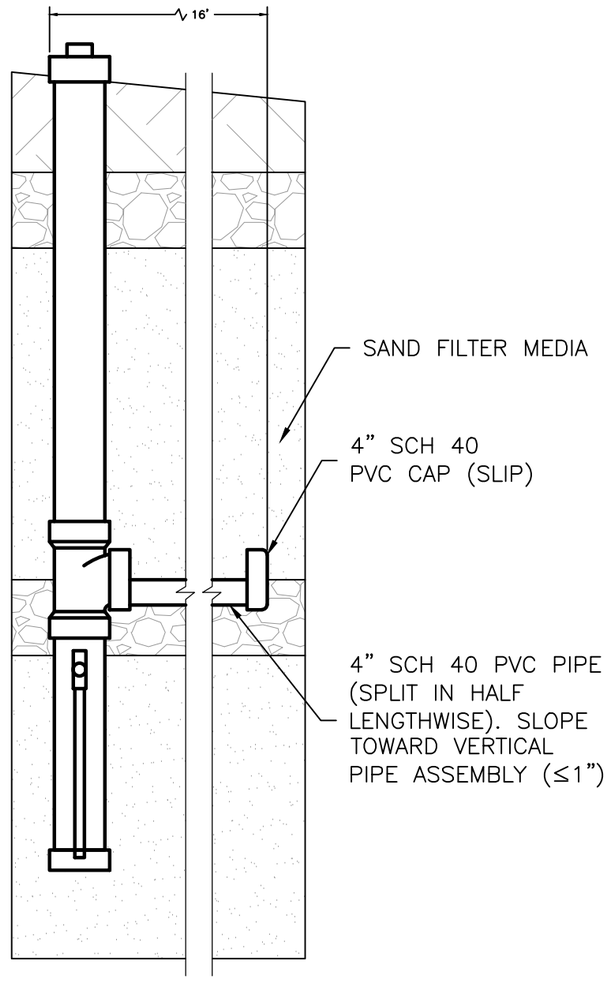
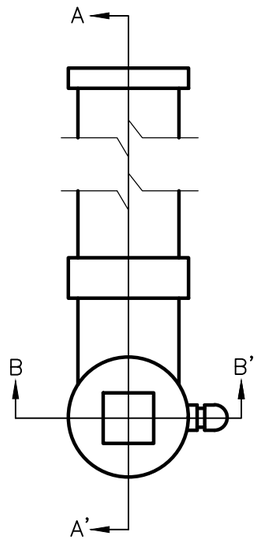


VIEW A–A'

0 1'

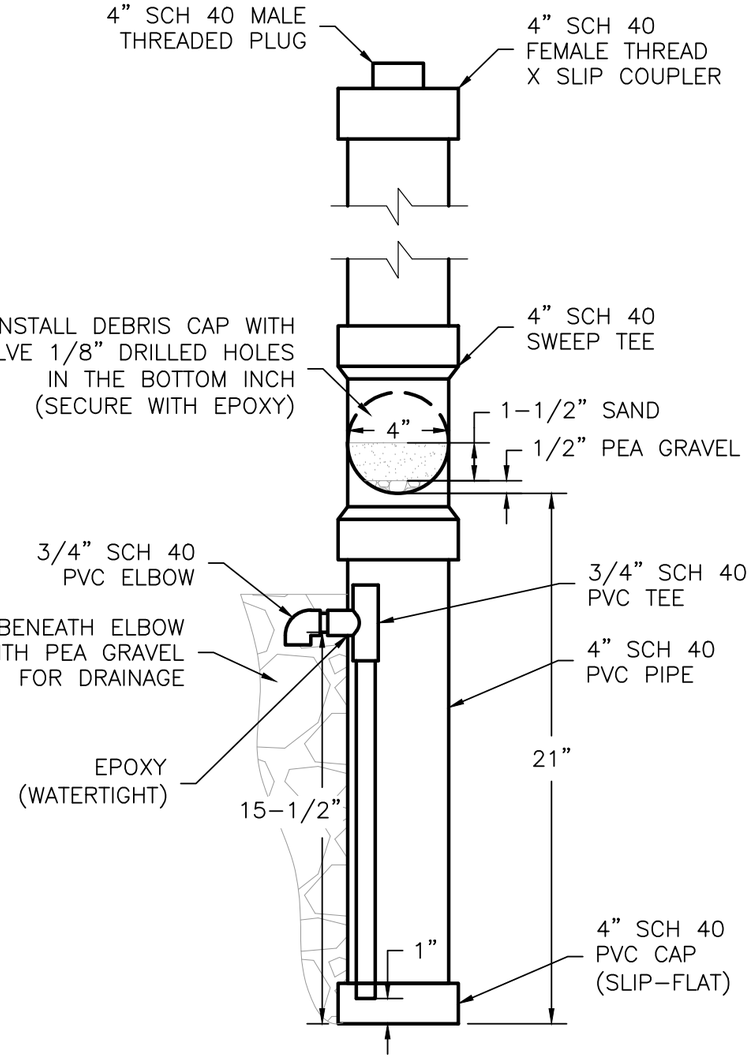
1"=1'



PLAN VIEW

0 0.5'

1"=0.5'



VIEW B–B'

0 0.5'

1"=0.5'

Figure 5. Lysimeter Details

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1–6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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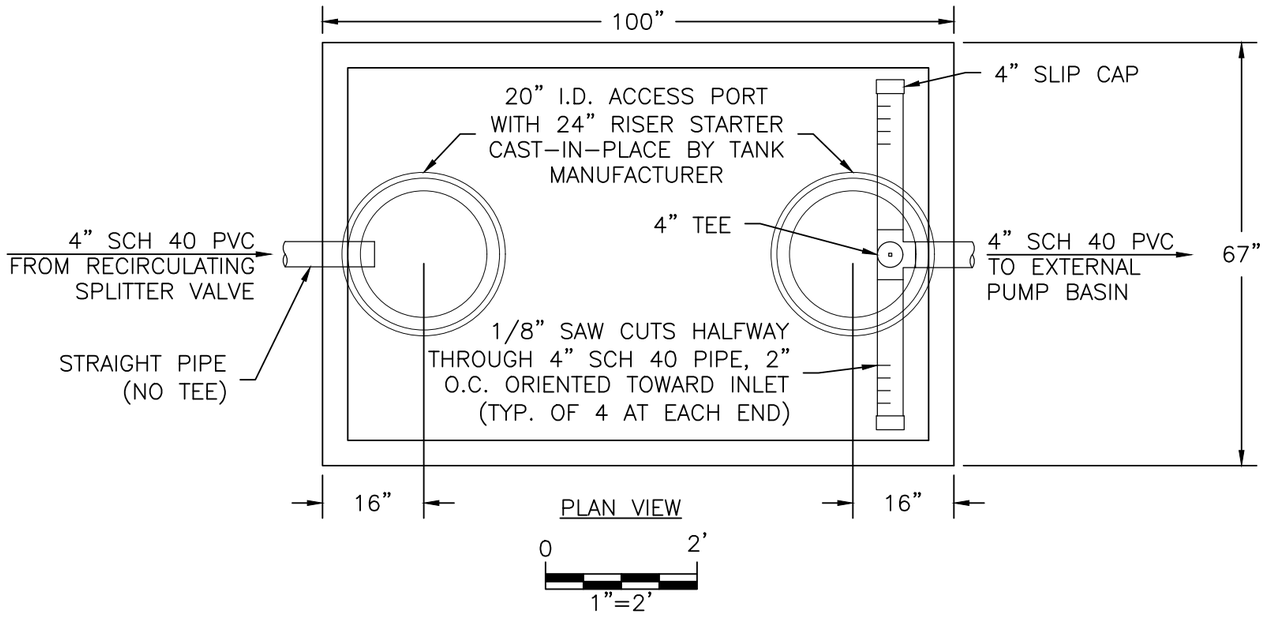

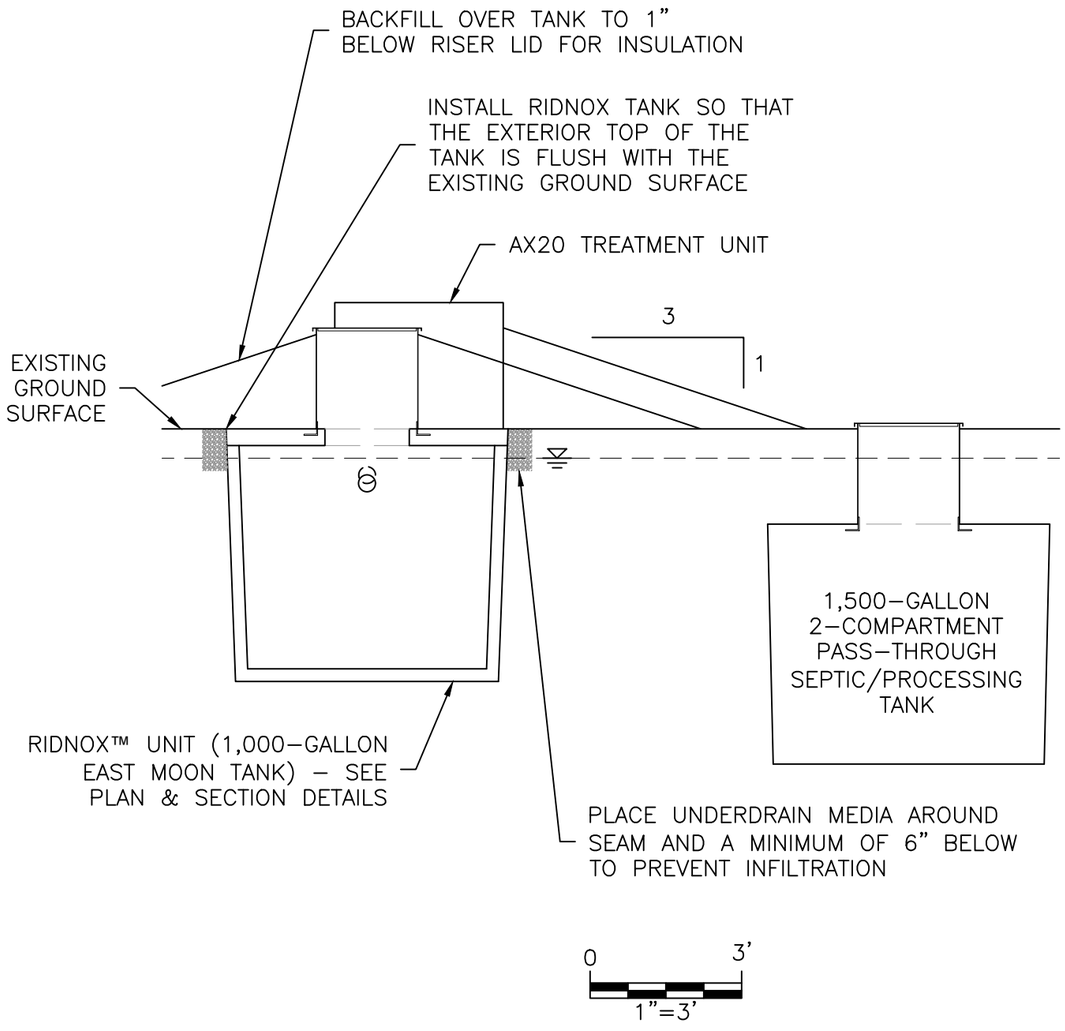

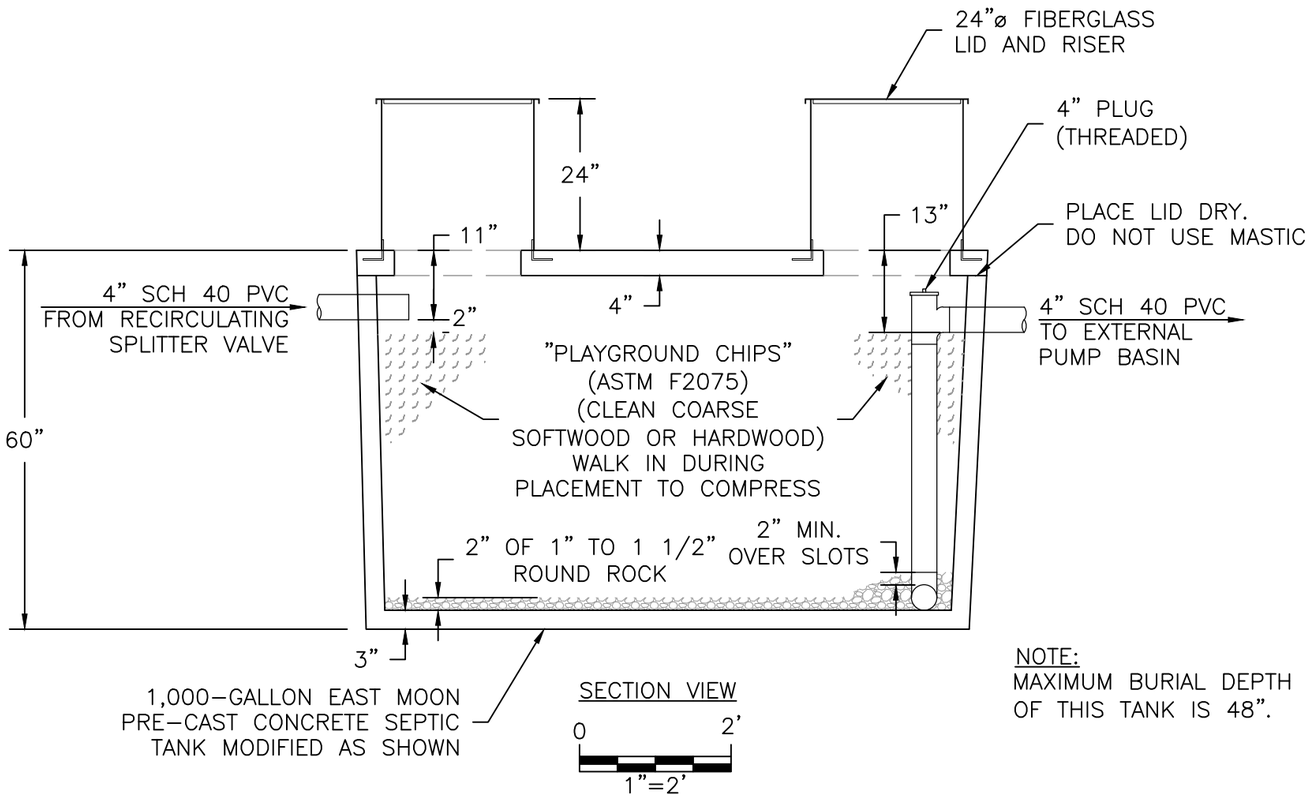

NOTE:
MAXIMUM BURIAL DEPTH OF THIS TANK IS 48".

Figure 6. RidNOx™ Details

PROJECT NUMBER: 2025003	Formal Variance
DATE: 6/30/2025	T20S, R11E, Section 31B, Tax Lots 6600 & 6700
DWG NO: 2025003 F1-6.DWG	Aaron Schwartz and Elizabeth Dantzker
DWG BY: DDR / PROJECT MANAGER: BRIAN RABE	17256 Lodgepole Lane
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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APPENDICES

Appendix A.

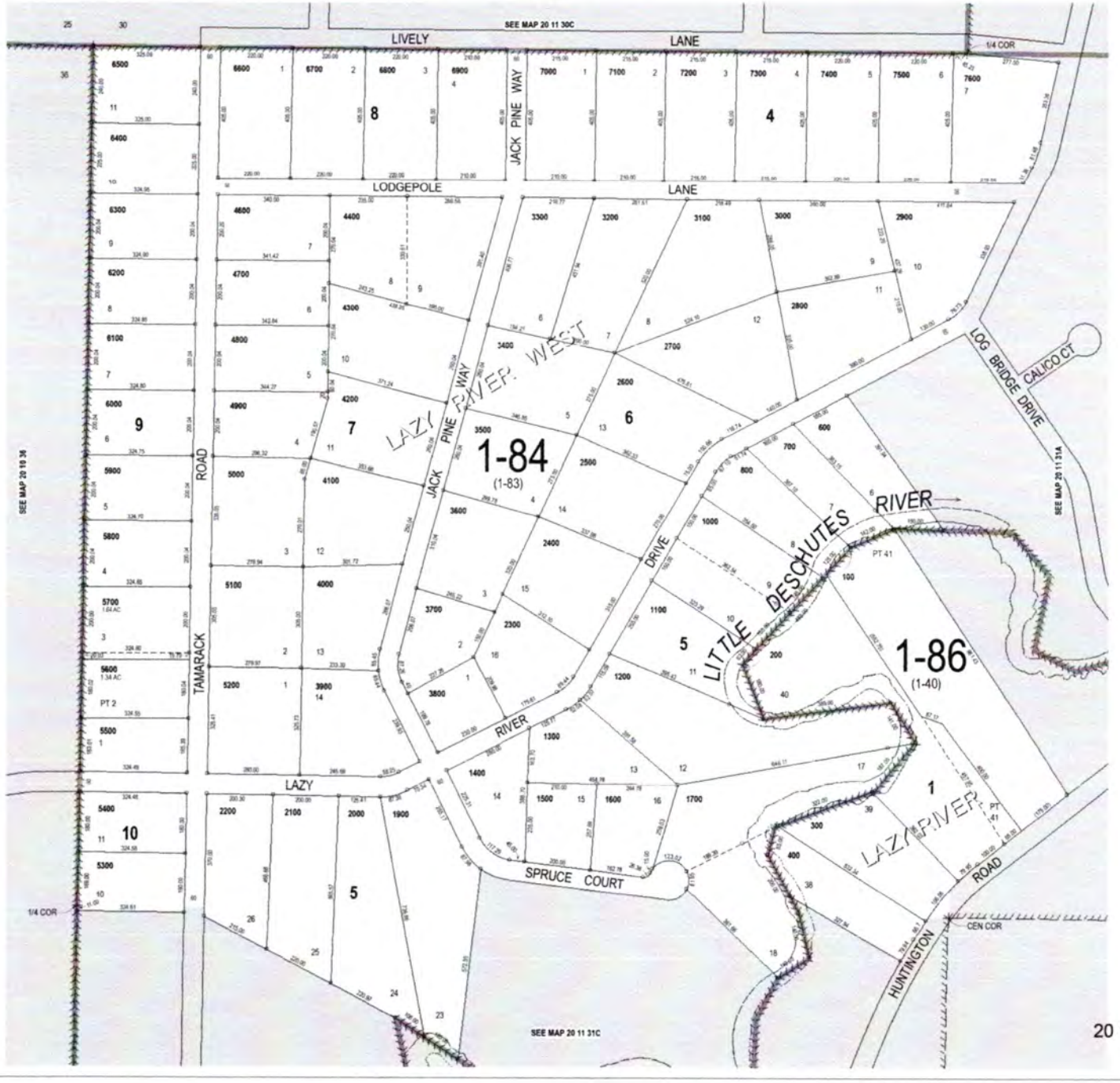
Tax Lot Map

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

1/17/2018

N.W.1/4 SEC.31 T.20S. R.11E. W.M.
DESCHUTES COUNTY
1" = 200'

20 11 31B0



Cancelled Nos.
500
900
1800
4500

Appendix B.

Deed

THIS SPACE PROVIDED FOR RECORDER'S USE ONLY:

Deschutes County Official Records
Steve Dennison, County Clerk **2024-12253**

01519194202400122530030031

D-D Cnt=1 Pgs=3 Stn=2 **05/16/2024 08:38 AM**
$15.00 $11.00 $61.00 $10.00 $6.00 $103.00

WHEN RECORDED RETURN TO:
Aaron Schwartz and Elizabeth Dantzker
4563 N. Borthwick Ave., Unit A
Portland, Oregon, 97217

APN: 126318

SPECIAL WARRANTY DEED

THE GRANTOR(S),

Aaron Schwartz

for and in consideration of: One Dollar ($1.00) and other good and valuable consideration grants, bargains, sells, conveys and specially warrants to the GRANTEE(S),

Aaron Schwartz and Elizabeth Dantzker, a married couple,

the following described real property:

Legal Description: Real property in the County of Deschutes, State of Oregon, described as follows:

Lots 1 and 2, Block 8, Lazy River West, Deschutes County, Oregon

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

Grantor Signatures:

Aaron Schwartz

DATED: 5/2/24

STATE OF OREGON, COUNTY OF MULTNOMAH, ss:

This instrument was acknowledged before me on this 2nd day of May, 2024 by Aaron Schwartz.

OFFICIAL STAMP
JAMES HASSINGER
NOTARY PUBLIC - OREGON
COMMISSION NO. 1011775
MY COMMISSION EXPIRES APRIL 22, 2025

Notary Public for Oregon

My commission expires 4/22/2025

Send future tax statements to:

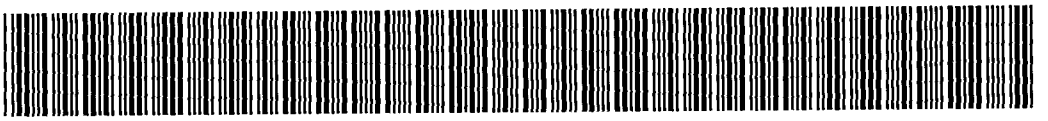
Aaron Schwartz
4563 N. Borthwick Ave,
Unit A
Portland, OR 97217

Appendix C.

Site Evaluation Reports

CDD COVER SHEET FOR LEF
11/26/2003 11:35:03

EH
1 PAGES



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TAXMAP	201131B006600
SERIAL	126318
DIVISION	EH
SITUS	
HOUSE#	
STREET	
CONTENT	SITE EVAL
RECORD ID	F743
LOCATED IN	DATE FILE

APPLICATION TO

DEPARTMENT OF ENVIRONMENTAL QUALITY

FOR

EVALUATION REPORT OF SUITABILITY OF PROPOSED SEWAGE DISPOSAL

FMH3
380-76

7-16 126318

DESCRIPTION OF PARCEL *(Attach a Plat or Map Showing All Sites as Exhibit A)*

Township ~~Section~~ 20 ; ~~Township~~ Range 11 ; Section 31B, County of Deschutes, Oregon; Tax lot 6600 1.4

Narrative Description: Lot 1 Block 8 LAZY RIVER WEST

PROPOSED USE OF PARCEL *(RESIDENTIAL - OTHER (SPECIFY))*

Residential

PRESENTLY DESIGNATED LAND USE, ZONING, AND NAME OF DESIGNATING AGENCY

Recreational Homesite

PROPOSED METHOD OF SEWAGE DISPOSAL *(Check one and Provide Requested Information)*

[ ] EXISTING SEWERAGE SYSTEM (Fee: $5 for one lot; $10 for two or more lots)

(1) Parcel is located within the boundaries of and can be provided sewerage service by the following entity which owns and operates a sewerage system:

Name of Entity _____

System Identification _____

Address of Entity _____

City, Zip Code _____

(2) Present status of sewers or sewer extensions to serve parcel:

(a) Plans for sewers ( ) have ( ) have not been prepared.
(b) Plans for sewers ( ) have ( ) have not been approved by DEQ.
(c) Sewers ( ) have (X) have not been installed.

(3) STATEMENT OF CERTIFICATION BY SEWERAGE SYSTEM OWNER (Separate statement may be attached if available).

As representative of the owner of the sewerage system named in (1) above, I hereby certify that sewerage service will be provided for the above described parcel, that said sewerage system has capacity to serve the parcel, and that the above information relative to the status of such sewerage service is correct to the best of my knowledge.

Signature of Representative _____

Title _____

Date _____

[ ] PROPOSED NEW SEWERAGE SYSTEM (Fee: $5 for one lot; $10 for two or more lots)

Has DEQ approved the proposed system previously in writing? ( ) No ( ) Yes, on _____ (date)
Has DEQ issued a Waste Discharge Permit for the proposed system? ( ) No ( ) Yes, Permit No. _____

[ ] SUBSURFACE SEWAGE DISPOSAL SYSTEM (Fee: $25 per lot)

Show location of proposed subsurface system or systems on the plat plan for each site which is attached as Exhibit A. For a subdivision of four or more sites, attach as Exhibit B:

1. A topographical map 2. Rates of slope data 3. Soils data 4. Water table data 5. Drainage data (surface and subsurface) 6. Water supply source and distribution systems data 7. Existing subsurface sewage disposal systems location

Special Instruction:

DEQ and/or its contract agent must complete a site investigation before a report can be given. To facilitate such investigation, prepare two (2) backhoe test holes at least 4 ft. deep and approximately 75 ft. apart (at the same approximate ground surface elevation) at the site of each proposed system.

Test holes ( ) have been prepared ( ) will be prepared by _____.

I HAVE ATTACHED THE REQUIRED EXHIBITS AND FEE SPECIFIED IN THE INSTRUCTIONS AND ON THIS APPLICATION AND HEREBY REQUEST FROM THE DEPARTMENT OF ENVIRONMENTAL QUALITY A REPORT OF SUITABILITY OF THE ABOVE DESCRIBED METHOD OF SEWAGE DISPOSAL FOR THE ABOVE DESCRIBED PARCEL.

Name of Applicant Clyde W. Purcell *Signature of Applicant* Clyde W. Purcell

Address of Applicant 728 N.E. Greenwood Avenue *Title* President- Prineville Water Co., Inc.

City, State, Zip Code Bend, Oregon 97701 *Phone:* 382-1232 *Date* _____

****

(FOR DEQ OR AGENT USE ONLY)

Comments and recommendations based on Subsurface Site Investigation by DEQ or Contract Agent:

This lot has been evaluated by a member of this department. Studies including but not limited to soil conditions, water table circumstances and topographical variations were conducted. It is the opinion of this department that it is feasible to install a septic tank and subsurface drainfield to serve a residence on this lot. This evaluation report shall remain in effect until issuance of a permit to construct, unless in the meantime conditions on subject or adjacent properties have been altered in any manner which would prohibit issuance of a permit in which case the evaluation report shall be considered null and void.

DESCHUTES COUNTY DEPT. OF HEALTH

Agent/DEQ Deschutes County Courthouse Annex Signature John K. Glover, R. S. Date October 26, 1976

BEND, OREGON 97701

****

Statement of DEQ or Agent Relative to Above Application

[ ] The above described method of sewage disposal is approved subject to the following conditions:

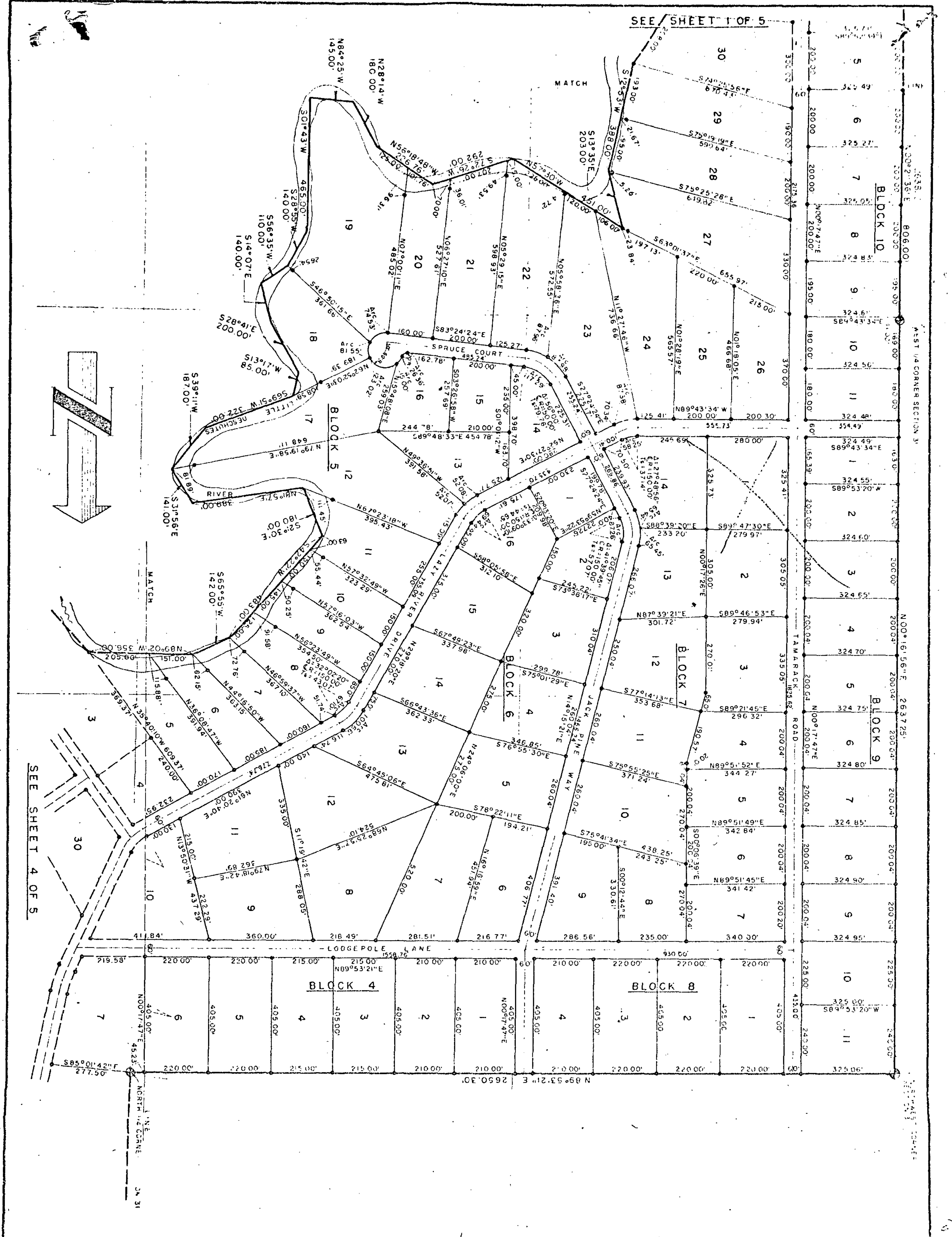
[ ] The above described method of sewage disposal is not approved for the following reasons:

One building site approved subject to the following conditions:

1. The soil in the proposed area of the drainfield and the replacement area cannot be altered.

2. A permit is required and must be obtained from the Deschutes County Health department prior to constructing the system.

DESCHUTES COUNTY DEPT. OF HEALTH
Deschutes County Courthouse Annex
Agent/DEQ BEND, OREGON 97701 Signature John K. Glover, R. S. Date October 26, 1976
For the Department of Environmental Quality DEQ Agent Representative



SEE SHEET 1 OF 5
SEE SHEET 4 OF 5
MATCH
MATCH
BLOCK 4
BLOCK 5
BLOCK 6
BLOCK 7
BLOCK 8
BLOCK 9
BLOCK 10
SPRUCE COURT
LITTLE DESCHUTES RIVER
LAZY RIVER DRIVE
JACK PINE WAY
TAMARACK ROAD
LODGEPOLE LANE
WEST 1/4 CORNER SECTION 31
N 89°53'21" E 2650.30'

SHEET 3 OF 5

CDD COVER SHEET FOR MUM
10/13/2004 15:46:58

EH
5 PAGES

FILE ID	201131B006700EH20041013154658
TAXMAP	201131B006700
SERIAL	126317
DIVISION	EH
SITUS	
HOUSE#	
STREET	
CONTENT	F21976
RECORD ID	F21976

DESCHUTES COUNTY

Community Development Department

Planning Division Building Safety Division Environmental Health Division

117 NW Lafayette Avenue Bend Oregon 97701-1925
(541)388-6575 FAX (541)385-1764
http://www.co.deschutes.or.us/cdd/

September 30, 2004

Norman Woolley
PO BOX 21903
Eugene, OR 97402

RE: F-21976- 20-11-31B TL 6700
Lodgepole Lane, Bend, Oregon

Dear Mr. Woolley:

A site evaluation for on site sewage disposal for a single family dwelling was recently completed at the above noted property.

Part of the evaluation is to determine the level to which the ground water rises during the wet season of a normal weather year. Permanent water tables are present throughout the year although they may fluctuate in elevation seasonally. The soil indicators used to determine the level to which the water table rises are gray soils and mottling (discoloration of the soil).

In the test pits on this property the indicators suggest the water table may rise to within 20 inches of the ground surface.

This parcel is denied for use of an on-site, sub-surface absorption system due to conditions associated with saturation.

Past observations and evaluations in this area verify the presence of a high water table.

Oregon Department of Environmental Quality Rules (DEQ) pertaining to on-site sewage disposal, require a minimum four foot separation between the bottom of a sewage disposal trench and the highest level a permanent water table may reach in the ground. Drainfields are installed a minimum of 12" into the ground. Drainfields can only be installed, therefore, where the water table does not rise closer than 5' from the ground surface. This allows for the 4' separation from the bottom of the trench to the water. [OAR Chapter 340-71-220(ld) and (2bA), copy enclosed.] These rules also allow for a 24 inch separation between the high level of the water table and the bottom of a surface mounted sand filter system. A sand filter is an alternative sewage disposal system that treats the sewage to a better extent than a drainfield, and is considerably more expensive to install.

DEQ rules would not allow installation of a Standard Drainfield, Capping Fill Drainfield, Pressurized Distribution System or Sand Filter System in these circumstances. [OAR 340-71-290(b)].

This property is, therefore, denied for on-site sewage disposal.

You have 90 days to provide additional test pits for evaluation at no additional fee. However, it appears that other areas on this property would not be suitable due to the lack of topographical changes.

Pursuant to Oregon Administrative Rules (OAR Chap. 340), if you conclude this report to be in error of these Rules, you may request a review. The report review is through the Department of
Environmental Quality. The application is a written request that includes all information you have received from Deschutes County, the reason the report is in error, citing the specific OAR~s that conflict with the report, and an application fee. DEQ will review the county report and visit the site to determine compliance with the appropriate rules.

Pursuant to Oregon Administrative Rules (OAR Chap. 340), you can request a variance from these Rules. The variance request is through the Department of Environmental Quality. This is not an automatic variance. You must provide technical justification that demonstrates your proposed system will operate over an extended period of time, that it will not degrade the environment and will provide public health protection. An application, justification and exhibits, including this Deschutes County report, a land use compatibility statement, and detailed plans of your proposed system will be necessary. Technical advice from a knowledgeable consultant is recommended. A variance application fee is required. A Variance Officer from DEQ will review your application and the property. A determination will be made, in writing, following an informational hearing. Deschutes County recognizes your right to a variance request. This property however, has severe limitations for on-site sewage disposal, as noted in the above report. Unless public health and environmental protection is assured, a variance request cannot be supported by the Deschutes County Environmental Health Division, and will not likely be approved by DEQ.

For further information regarding a report review for a variance request, please contact the Oregon Department of Environmental Quality at 2146 NE 4th Suite 104, Bend OR 97701, phone 541-388-6146.

If you have any questions, please do not hesitate to this office.

Sincerely,

ENVIRONMENTAL HEALTH DIVISION

Todd Cleveland

Todd Cleveland, R.S.
Sanitarian
TSC/mum

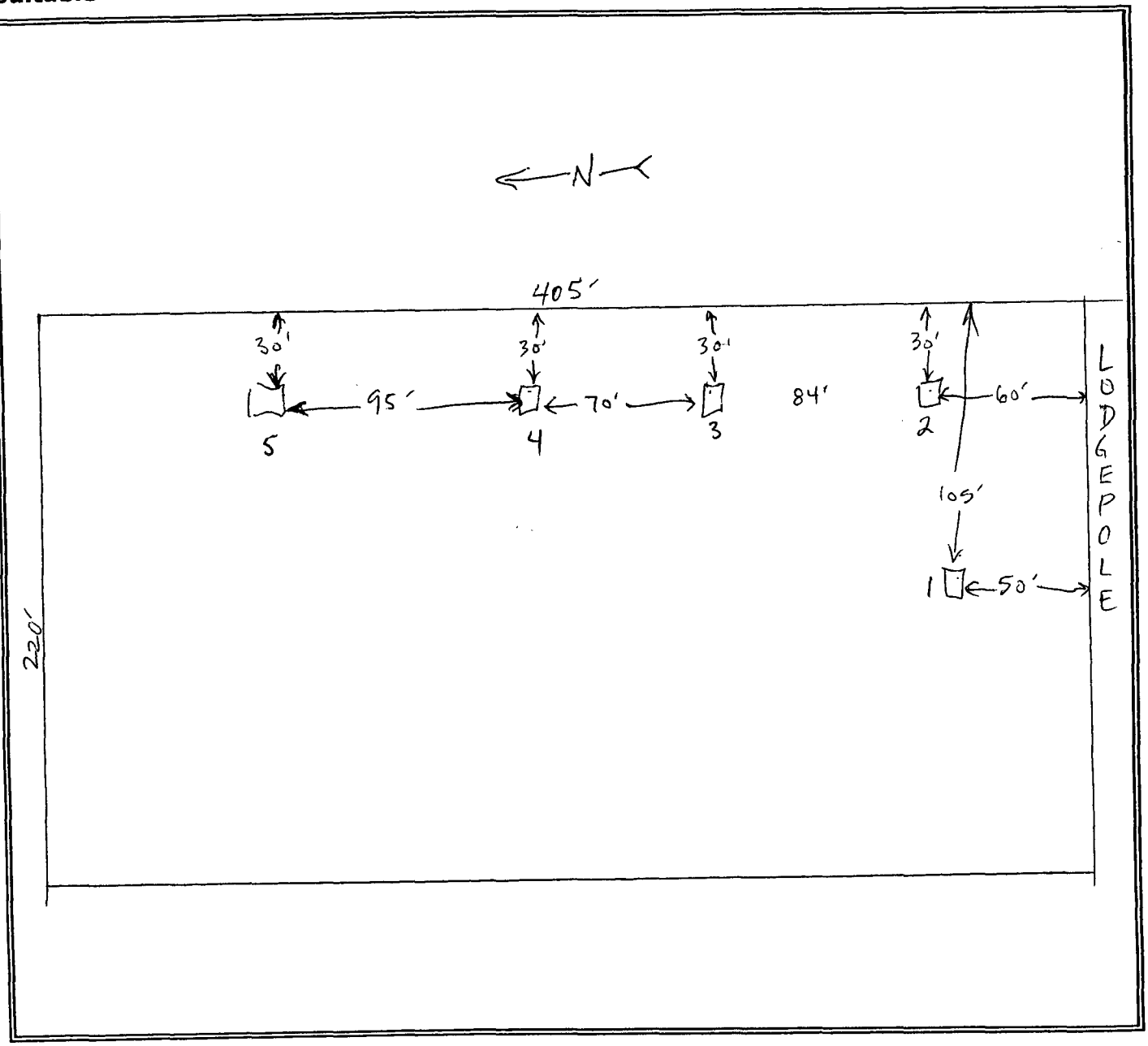
cc: S & W Construction

PC Bob Baggett (Department of Environmental Quality)

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Norman Woolley Site Evaluation # F 21976
Date: 9/28/04 Subdivision: Lazy River West L 2 B 8 Parcel Size: 2.00
Evaluator: Todd Cleveland T 20 R 11 S 31 BC TL 6700

Suitable **Sketch/Not to Scale** **Unsuitable**



System type approved:
Initial Denied
Replacement
Tank Size

Absorption facility:
Min. Size ____ Max. Depth ____ Min. Depth ____
Min. Size ____ Max. Depth ____ Min. Depth ____
Sewage Flow ____

Special Conditions: This site is denied due to conditions associated with saturation within 24 inches of the ground surface.

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Norman Woolley Site Evaluation # F 21976

Evaluator: Todd Cleveland Date: 9/28/04 Parcel Size: 2.00

Subdivision: Lazy River West T 20 R 11 S 31 BØ TL 6700 L 2 B 8

	DEPTH	TEXTURE	COLOR	Notes on mottling, roots, structure, layer limiting effective soil depth, % loose rock, etc.
1	0 - 5	lcs	10YR 3/2	3vfftmlc; Sg; loose;
	5 - 24	cos	10YR 4/3	lf; Sg; loose; @ 18" + flf dep. 10YR 7/2 fld black 10YR 2/1
	24 - 44	fsl	10YR 4/2	ØRmf s.1 2msbk; friable; C2d Fe conc. 10YR 4/4
	44 - 80	vgrS	10YR 3/1	ØRootS; Sg; ~40% gravel; C2d Fe conc. 10YR 3/6; 80" water
2	0 - 6	Similar to hole 1		in all respects
	6 - 24			@ 18"-19" flf depletions + fld black conc. 10YR 7/2, 10YR 2/1
	24 - 45			C2d Fe conc,
	45 - 82	vgrS		~50% gravel; water @ 82"
3	0 - 6	lcos	Similar to other holes except as noted	
	6 - 23	cos		@ 17" C2d Fe conc. 10YR 4/6
	23 - 51	fsl	10YR 3/1	C2d Fe conc
	51 - 60	vgrS		
4	0 - 8	Similar to	hole 3	
	8 - 24			flf dep + reductions 10YR 7/2 10YR 3/1 few black
	24 - 49			C2d Fe conc.
	49 - 80			
5	0 - 21	lcoS	10YR 4/2	2fmc; Sg; loose; @ 6" + C2d Fe conc + dep. 10YR 5/6 4/6 3/0
	21 - 48	fsl	~~2.5~~ 10YR 4/2	ØRmf; 2msbk; C2d Fe conc. 10YR 3/6 dep 10YR 6/2
	48 - 54	vgrS	10YR 3/1	ØRootS; Sg; ~50% gravel; C2d Fe mass 7.5YR 3/2
6				
7				

Landscape Note: terraces; lodgepole, bitterbrush, ~~bitterbrush~~, bunchgrass, rushes, currant

Slope: 0 - 2% Aspect: ~~ENE~~ N Groundwater: permanent 16" - 19"

Other site notes: water @ 80" in hole 1; hole 2: 82"; hole 5 too gravelly to dig

Comments:

Reason for Unsuitability: (Include Rule Reference)

OAR 340-71-220; OAR 340-71-265 OAR 340-71-290, OAR 340-71-100

APPLICATION FOR

INDIVIDUAL SITE EVALUATION

DESCHUTES COUNTY

COMMUNITY DEVELOPMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
117 NW LAFAYETTE AVE, BEND, OR 97701 (541) 388-6575
737 SW Cascade Ave, Redmond, OR (541) 385-1713

Evaluation Number: F21976

The following information is required to complete an application for a site evaluation. Please be as accurate and complete as possible.

TOWNSHIP 20	RANGE 11	SECTION 31B	TAX LOT 6700	LEGAL LOT	ZONING
SUBDIVISION LAZY RIVER WEST			LOT	BLOCK	
ADDRESS OF PARCEL					
PARCEL SIZE IN SQ FT OR ACRES 2 AC		NUMBER OF BEDROOMS 3		WATER SOURCE Well	

NAME OF OWNER	TELEPHONE	AUTHORIZED REPRESENTATIVE	TELEPHONE
Norm Woolley	541-683-7585	STW Const.	541-536-3675
MAILING ADDRESS P.O. Box 21903		MAILING ADDRESS P.O. Box 2070	
CITY Eugene STATE OR ZIP 97402		CITY LaPine STATE OR ZIP 97739	

COMMENTS/REMARKS

PLANNING NOTIFICATION

FOR COMMERCIAL USE ONLY

TYPE OF USE	DAILY FLOW	FEE

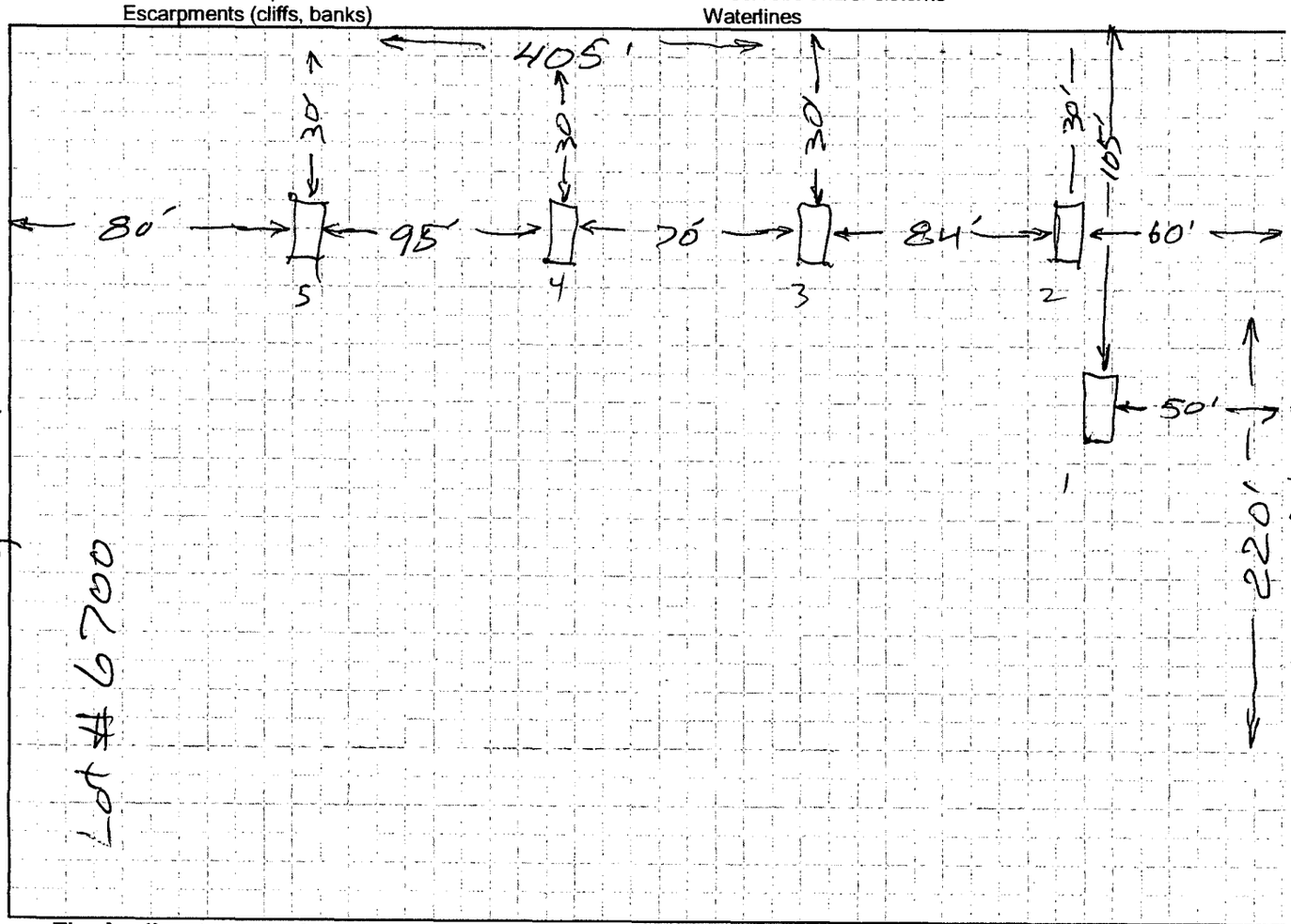
Please answer the following questions:

	YES	NO
1. Are there any bodies of water on or adjacent to this property?	☐	☑
2. Are there existing wells on the property?	☐	☑
3. Are there any proposed wells on the property?	☐	☑
4. Are there existing wells on adjacent property?	☐	☑
5. Will this property be served by a community water supply?	☐	☑
6. Are there any encumbrances which could prevent or effect the installation of a subsurface sewage disposal system? (Liens, easements)	☐	☑

TEST HOLES ARE READY? (YES) NO

In this area below, sketch the parcel showing the location of:

- Adjoining roads or streets
- Property lines and dimensions
- Location of test pits
- Escarpments (cliffs, banks)
- Existing and proposed wells
- All bodies of water (rivers, canals, ponds)
- Wells on adjacent properties
- Reservoirs and/or cisterns
- Waterlines



The Applicant agrees that Deschutes County will not be responsible for any problems or denials resulting from incorrect or incomplete information supplied by the applicant.

READ BEFORE SIGNING

SIGNATURE OF OWNER/AUTHORIZED REPRESENTATIVE	DATE	AMOUNT
X	9-7-04	

June 3, 2024

Aaron Schwartz
4563 N Borthwick Ave #Unit A
Portland, OR 97217

RE: 247-24-000432-EVAL – 17256 Lodgepole Ln, Bend

A site evaluation for an onsite wastewater treatment system for a single family dwelling was recently completed at the property noted above. Test pits were evaluated on May 28, 2024. Part of the evaluation is to determine the level to which the groundwater rises during the wet season of a normal weather year. Permanent water tables are present throughout the year although they may fluctuate in elevation seasonally. The soil indicators used to determine the level to which the water table rises are gray soils and mottling (discoloration of the soil).

In the test pits on the property the indicators suggest the water table may rise within 6-10 inches of the ground surface. Based on soil characteristics, the water table may rise to the ground surface on portions of this parcel. Past observations and site evaluations in the surrounding area also verify the presence of a high-water table. Extensive study and modeling of the groundwater in south Deschutes County has demonstrated that this area is sensitive to added loading from areas that do not meet separation to groundwater. **This site is denied due to high permanent groundwater observed and conditions associated with saturation.**

The site is denied based on the following:

- Does not meet minimum separation from permanent water table (OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302).
- Installation of an onsite wastewater system in the area evaluated will likely lead to nitrate pollution of public waters. The Nitrate Loading Management Model indicates this area, Management Area 18, cannot sustain added loading from high groundwater lots if nitrate levels are to remain below the action level in groundwater (Morgan, Hinkle, Weick. USGS. 2007). Groundwater shall be protected from pollution that could impair existing and future beneficial uses, including domestic drinking water from wells (OAR 340-040-0020).
- Deschutes County may not authorize installation or use of a system that is likely to pollute public waters or create a public health hazard (OAR 340-071-0130(1)). Nitrogen loading from an onsite wastewater system on this property likely will contribute to the development of a public health hazard and groundwater contamination.

You have 90 days from the initial site visit to provide additional test pits for evaluation at no additional fee. However, it appears that other areas on the property would not be suitable due to the lack of topographical changes.

REVIEW AVAILABLE

Pursuant to Oregon Administrative rules (OAR 340-071). You may request a site evaluation report review if you believe this report to be in violation of the rules. The Oregon DEQ conducts report reviews upon submission of the appropriate application materials including: a written request that includes all information you have received from Deschutes County, the reason the report is in error including the specific Oregon Administrative Rules that

conflict with the report, and the application fee. The DEQ will review the county's report and visit the site to determine the report's compliance with the appropriate rules.

Also pursuant to this rule, you may request a variance from these rules. The Oregon DEQ reviews variance requests upon application. This is not an automatic variance. You must provide technical justification that demonstrates your proposed system will operate over an extended period of time, will not degrade the environment, and will provide public health protection.

An application, application fee, justification and exhibits, including this report, a land use compatibility statement and detailed plans of your proposed system are required for the application. Technical advice from a knowledgeable consultant is recommended. A Variance Office from DEQ will review your application and the property and issue a written determination following an informational hearing.

Deschutes County recognizes your right to a variance request. This property, however, has severe limitations for onsite wastewater treatment as noted above. Unless public health and environmental protection can be assured, a variance request cannot be supported by the Deschutes County Onsite Wastewater Division and will not likely be approved by DEQ.

For further information regarding a report review for a variance request, please contact the Oregon Department of Environmental Quality at 471 NE Bellevue Dr., #110, Bend, OR 97701, phone 541-388-6146.

If you have any questions, please do not hesitate to call this office at 541-388-6519.

Sincerely,
Onsite Wastewater Division

Todd Cleveland

Todd Cleveland, REHS
Onsite Wastewater Manager

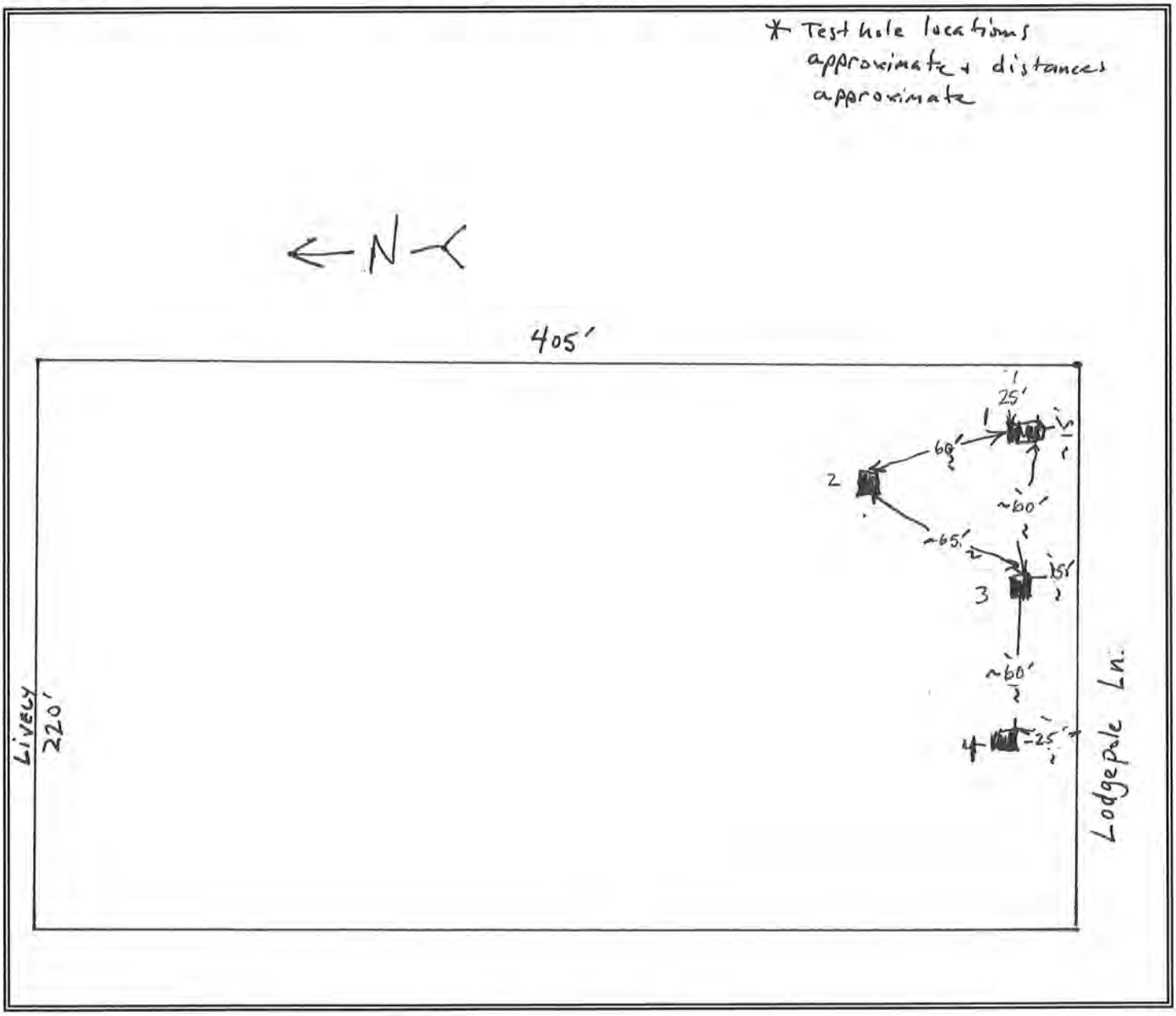
SITE EVALUATION FIELD INSPECTION FORM

Applicant: SCHWARTZ, AARON Site Evaluation # 247-24-000432-EVAL

Date: May 28, 2024 Subdivision: Lazy River West L 1 B 8 Parcel Size: 2.03

Evaluator: Todd Cleveland T 20 R 11 S 31B0 TL 6600

Suitable **Sketch/Not to Scale** ✓**Unsuitable**



systems and parameters approved are the **minimum to meet current DEQ rules*

System type approved: denied Absorption facility: denied

Initial _____ Min. Size _____ Max. Depth _____ Min. Depth _____

Replacement _____ Min. Size _____ Max. Depth _____ Min. Depth _____

Tank Size _____ Sewage Flow _____

Special Conditions: This site is denied because soil characteristics indicate the water table rises within 24 inches of the ground surface. Soil characteristics indicate the water table rises within 10" of the ground surface and potentially to the ground surface on a portion of this lot. This property is also located in an area where groundwater is sensitive to nutrient loading from onsite wastewater systems.

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Schwartz Site Evaluation # 247-24-000432-EVAL

Evaluator: Todd Cleveland Date: 5/28/2024 Parcel Size: 2.03

Subdivision: Lazy River West T 20 R 11 S 31B0 TL 06600 L 1 B 8

	DEPTH	TEXTURE	COLOR	Notes on roots, structure, % loose rock, mottling, layer limiting effective soil depth, etc.
1	0-10	coSL	10 YR 4/3	2vf,f,1m; 1msbk>sg; loose pumice
	10-19	LcoS	10 YR 4/2	V1f; sg; faint stripping & staining 10 YR 6/2 (increases w/depth)
	19-42	grSL	10 YR 3/2	0 Roots; 2csbk; c2d Fe conc.; 20% gravel
	42-53	vgrS	10 YR 2/1	0 Roots; sg; black sand & gravel; ~35% gravel
2	0 – 10	coSL	10 YR 4/3	2fm1c; 1msbk; similar to hole 1
	10 – (24-32)	LcoS	10 YR 4/2	V1f; sg; f1f > c2d Fe stripping & staining increases with depth
	(24-32) - 50	grSL	10 YR 3/2	0 roots; 2csbk; c2d Fe conc.
	50+	vgrS	10 YR 2/1	0 roots; sg; black sand & gravel
3	0 - 9	coSL		Similar to other holes except as noted
	9 – 22	LcoS		Stripping & staining @ 9" +
	22 – 49	grSL	10 YR 3/2	V1f; 2csbk; c2d Fe conc.
	49+	vgrS		
4	0 – 6	coSL	10 YR 4/2	2vf,f1c; 1msbk; gray to the surface (likely water near surface)
	6 – 20	LcoS	10 YR 5/2	1m; sg; stripped with faint Fe staining 9" +
	20 – 42	grSL	10 YR 3/2	C2d Fe conc.
	42 - 49	vgrS	10 YR 2/1	
5				
6				
7				

Landscape Note: terrace; lodgepole, bitterbrush, currant, bunchgrass, rushes

Slope: 0-2% Aspect: NNW Groundwater: perm. 0 – 10" below ground surface

Other site notes: Appears the lot may have been logged or otherwise disturbed in the distant past.

Comments:

Reason for Unsuitability: (Include Rule Reference)

OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302; 340-071-0130(1); (see letter)

DESCHUTES COUNTY

COMMUNITY DEVELOPMENT

August 5, 2024

SCHWARTZ, AARON & DANTZKER, ELIZABETH
4563 N BORTHWICK AVE #UNIT A
PORTLAND, OR 97217

RE: 247-24-000432-EVAL-01
17256 LODGEPOLE LN, BEND, OR 97707 - 201131B006600

A site evaluation for an onsite wastewater treatment system for a single-family dwelling was recently completed at the property noted above. Additional test pits were evaluated on July 24, 2024. A couple of pits were off the subject property, and the north end of the property adjacent to Lively Ln has been modified. Portions of this area appear to have water ponded at the surface at times in the past. Part of the evaluation is to determine the level to which the groundwater rises during the wet season of a normal weather year. Permanent water tables are present throughout the year although they may fluctuate in elevation seasonally. The soil indicators used to determine the level to which the water table rises are gray soils and mottling (discoloration of the soil).

In the additional test pits on the property the indicators suggest the water table may rise within 8-13 inches of the ground surface. Based on soil characteristics, the water table may rise to the ground surface on portions of this parcel. Past observations and site evaluations in the surrounding area also verify the presence of a high-water table. Extensive study and modeling of the groundwater in south Deschutes County has demonstrated that this area is sensitive to added loading from areas that do not meet separation to groundwater. **This site is denied due to high permanent groundwater observed and conditions associated with saturation.**

The site is denied based on the following:

- Does not meet minimum separation from permanent water table (OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302).
- Installation of an onsite wastewater system in the area evaluated will likely lead to nitrate pollution of public waters. The Nitrate Loading Management Model indicates this area, Management Area 18, cannot sustain added loading from high groundwater lots if nitrate levels are to remain below the action level in groundwater (Morgan, Hinkle, Weick. USGS. 2007). Groundwater shall be protected from pollution that could impair existing and future beneficial uses, including domestic drinking water from wells (OAR 340-040-0020).
- Deschutes County may not authorize installation or use of a system that is likely to pollute public waters or create a public health hazard (OAR 340-071-0130(1)). Nitrogen loading from an onsite wastewater system on this property likely will contribute to the development of a public health hazard and groundwater contamination.

You have 90 days from the initial site visit to provide additional test pits for evaluation at no additional fee. However, it appears that other areas on the property would not be suitable due to the lack of topographical changes.

REVIEW AVAILABLE

Pursuant to Oregon Administrative rules (OAR 340-071). You may request a site evaluation report review if you believe this report to be in violation of the rules. The Oregon DEQ conducts report reviews upon submission of

the appropriate application materials including: a written request that includes all information you have received from Deschutes County, the reason the report is in error including the specific Oregon Administrative Rules that conflict with the report, and the application fee. The DEQ will review the county's report and visit the site to determine the report's compliance with the appropriate rules.

Also pursuant to this rule, you may request a variance from these rules. The Oregon DEQ reviews variance requests upon application. This is not an automatic variance. You must provide technical justification that demonstrates your proposed system will operate over an extended period of time, will not degrade the environment, and will provide public health protection.

An application, application fee, justification and exhibits, including this report, a land use compatibility statement and detailed plans of your proposed system are required for the application. Technical advice from a knowledgeable consultant is recommended. A Variance Office from DEQ will review your application and the property and issue a written determination following an informational hearing.

Deschutes County recognizes your right to a variance request. This property, however, has severe limitations for onsite wastewater treatment as noted above. Unless public health and environmental protection can be assured, a variance request cannot be supported by the Deschutes County Onsite Wastewater Division and will not likely be approved by DEQ.

For further information regarding a report review for a variance request, please contact the Oregon Department of Environmental Quality at 471 NE Bellevue Dr., #110, Bend, OR 97701, phone 541-388-6146.

If you have any questions, please do not hesitate to call this office at 541-388-6519.

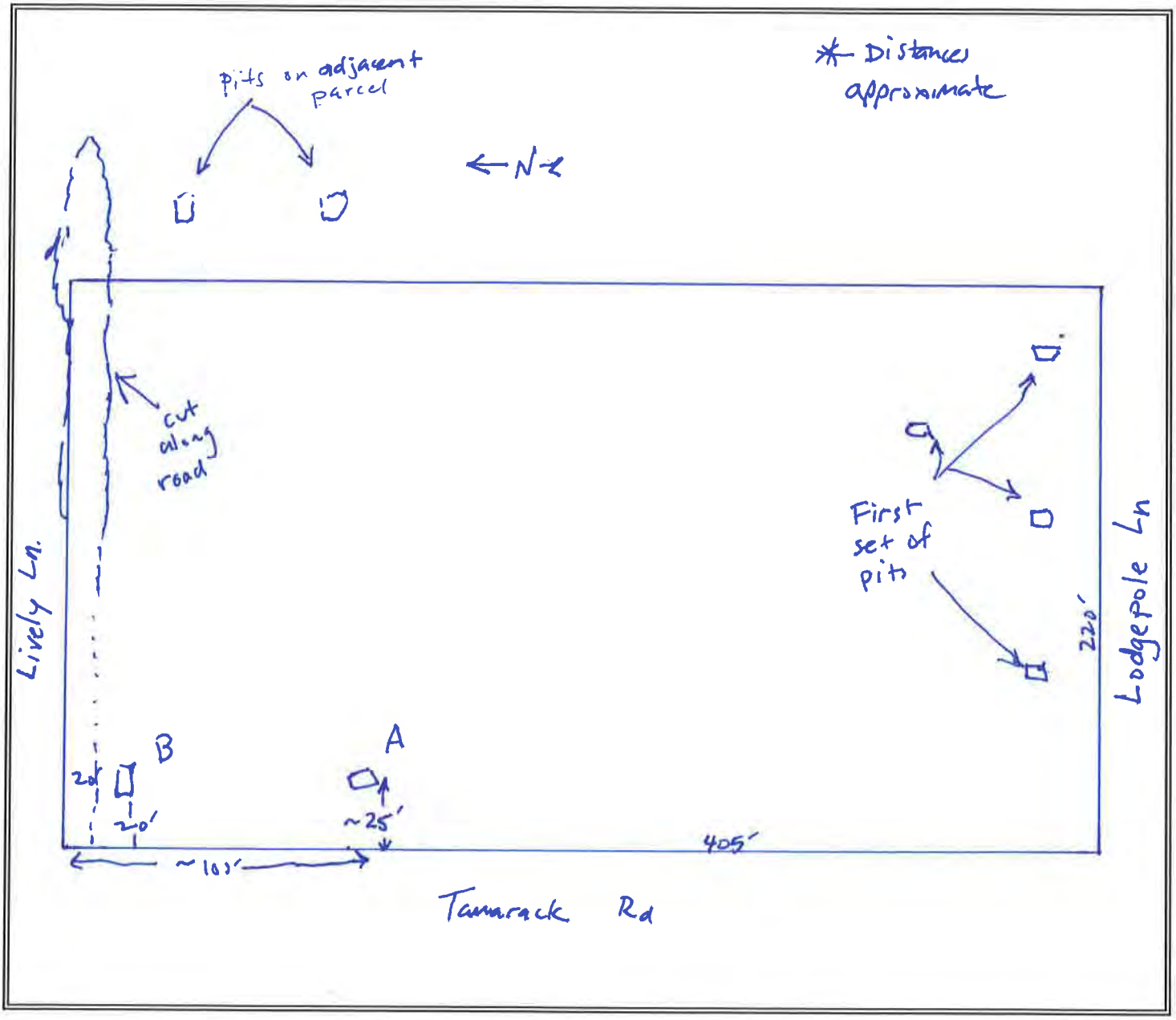
Sincerely,
Onsite Wastewater Division

Todd Cleveland

Todd Cleveland, REHS
Onsite Wastewater Manager

SITE EVALUATION FIELD INSPECTION FORM

Applicant: SCHWARTZ, AARON Site Evaluation # 247-24-000432-EVAL-01
Date: July 24, 2024 Subdivision: Lazy River West L 1 B 8 Parcel Size: 2.03
Evaluator: Todd Cleveland T 20 R 11 S 31B0 TL 6600
Suitable **Sketch/Not to Scale** ✓**Unsuitable**



systems and parameters approved are the **minimum to meet current DEQ rules*

System type approved: denied Absorption facility: denied
Initial _____ Min. Size _____ Max. Depth _____ Min. Depth _____
Replacement _____ Min. Size _____ Max. Depth _____ Min. Depth _____
Tank Size _____ Sewage Flow _____

Special Conditions: This site is denied because soil characteristics indicate the water table rises within 24 inches of the ground surface. Soil characteristics indicate the water table rises within 8-13" of the ground surface and potentially to the ground surface on a portion of this lot. This property is also located in an area where groundwater is sensitive to nutrient loading from onsite wastewater systems.

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Schwartz Site Evaluation # 247-24-000432-EVAL-01

Evaluator: Todd Cleveland Date: 7/24/24 Parcel Size: 2.03

Subdivision: Lazy River West T 20 R 11 S 31B0 TL 06600 L 1 B 8

	DEPTH	TEXTURE	COLOR	Notes on roots, structure, % loose rock, mottling, layer limiting effective soil depth, etc.
A	0-8	coSL/LcoS	10 YR 4/3	2vf,f,1m; 1msbk>sg; loose pumice
	8 – 27	LcoS	10 YR 4/3	V1f; sg; faint stripping & staining
	27 - 42	grSL	10 YR 3/2	0 Roots; 2csbk; c2d Fe conc.; 20% gravel
B	0 - 8	coSL/LS	10 YR 4/3	2fm1c; 1msbk; similar to hole 1
	8 – 22	LcoS	10 YR 4/2	V1f; sg; f1f > c2d Fe stripping @ 12-15"+
	22 – 39	grSL	10 YR 3/2	0 roots; 2csbk; c2d Fe conc.
	39 - 52	vgrS	10 YR 2/1	0 roots; sg; black sand & gravel
				Other pits were located on adjacent property
5				
6				
7				

Landscape Note: terrace; lodgepole, bitterbrush, currant, bunchgrass, rushes

Slope: 0-2% Aspect: NNW Groundwater: perm. 8-13" below ground surface

Other site notes: Appears the lot may have been logged or otherwise disturbed in the distant past. A road cut and fill has occurred along the north property line along Lively Ln. Two other pits were not on the subject property but located on the adjacent property and not part of this evaluation.

Comments:

Reason for Unsuitability: (Include Rule Reference)

OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302; 340-071-0130(1); (see letter)

Appendix D.

NRCS Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties

17256 and 17262 Lodgepole Lane

June 30, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties
Survey Area Data: Version 22, Aug 30, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2019—Nov 4, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
115A	Shanahan loamy coarse sand, low, 0 to 3 percent slopes	4.0	100.0%
Totals for Area of Interest		**4.0**	**100.0%**

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, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Upper Deschutes River Area, Oregon, Parts of Deschutes, Jefferson, and Klamath Counties

115A—Shanahan loamy coarse sand, low, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 23zd
Elevation: 4,000 to 4,500 feet
Mean annual precipitation: 18 to 25 inches
Mean annual air temperature: 40 to 44 degrees F
Frost-free period: 10 to 30 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Shanahan, low, and similar soils: 90 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shanahan, Low

Setting

Landform: Lava plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over old alluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 9 inches: loamy coarse sand
H2 - 9 to 14 inches: gravelly loamy coarse sand
H3 - 14 to 21 inches: coarse sand
H4 - 21 to 27 inches: loamy coarse sand
H5 - 27 to 38 inches: sandy loam
H6 - 38 to 45 inches: gravelly sandy loam
H7 - 45 to 62 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 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: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F006XY718OR - Cryic Xeric Pumice Basins 18-25 PZ

Other vegetative classification: Pinus contorta/Pushia tridentata/Festuca idahoensis (CLS214)
Hydric soil rating: No

Minor Components

Cryaquolls
Percent of map unit: 1 percent
Landform: Terraces
Ecological site: R006XB102OR - Cold Wet Meadow
Hydric soil rating: Yes

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Appendix E.

Water Well Reports

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.545 & 537.765 and OAR 690-205-0210)

DESC 65163
2/26/2025

WELL I.D. LABEL# L 156782
START CARD # 1076343
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name AARON Last Name SCHWARTZ
Company
Address 4653 N. BORTHWICK UNIT A
City PQRTLAND State OR Zip 97217

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment(complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD

[ ] Rotary Air [ ] Rotary Mud [X] Cable [X] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE

[X] Domestic [ ] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [ ] (Attach copy)
Depth of Completed Well 223.00 ft.

BORE HOLE

Dia	From	To
10	0	20
6	20	223

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	20	15	S
		Calculated	12	
		Calculated		

Seal placement method: [ ] A [ ] B [ ] C [ ] D [ ] E [X] Other: POURED
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: [ ] Type Amount
Seal Placement Begin Date 1/27/2025 Begin Time 11 00

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

C/L	Dia	+	From	To	Gauge	Mat. Type	Wld	Thrd	Shoe	Shoe Location
C	6	X	2	223	0.250	ST	X			

Temp casing [ ] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Material

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ Pipe size

(8) WELL TESTS: Minimum testing time is 1 hour

Type of Test	Yield (gal/min)	Drawdown	Drill Stem/ Pump Depth	Duration (hr)
Pump	25	6	29	3

Temperature 42 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 138 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 11.00 E E/W WM
Sec 31 NW 1/4 of the NW 1/4 Tax Lot 6700
Tax Map Number Lot
Lat ° ' " or 43.80446199 DMS or DD
Long ° ' " or -121.46394574 DMS or DD
(•) Street address of well ( ) Nearest address
17202 LODGEPOLE

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	2/19/2025			23

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 222.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
2/19/2025	222	223	25			23

(11) WELL LOG

Ground Elevation 4188.01 FT

Material	From	To
top soil	0	1
brown sand and gravel	1	11
gray clay	11	25
cemented gravel	25	50
black sand and pumice	50	83
silt with gravel	83	120
yellow diatamite with black sand	120	173
pink ash and pumice	173	222
pumice and black rock	222	223

Construction
Begin Date 12/23/2024 Begin Time 08 30 End Date 2/19/2025

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 2078 Date 2/25/2025
Signed RICK KING JR (E-filed)

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1528 Date 2/26/2025
Signed STEVE MATHERS (E-filed)
Drilling Company: mathers drilling

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version:
New exempt use wells must be submitted with a map and recording fee.

WATER SUPPLY WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

DESC 65163

2/26/2025

Map of Hole

STATE OF OREGON
WELL LOCATION MAP

This map is supplemental to the WATER SUPPLY WELL REPORT

Oregon Water Resources Department
725 Summer St NE, Salem OR 97301
(503)986-0900

LOCATION OF WELL
Latitude: 43.80446199 Datum: WGS84
Longitude: -121.46394574
Township/Range/Section/Quarter-Quarter Section:
WM20.00S11.00E31NWNW
Address of Well:
17202 LODGEPOLE

Well Label: 156782

Printed: February 25, 2025

DISCLAIMER: This map is intended to represent the approximate location the well. It is not intended to be construed as survey accurate in any manner.

Provided by well constructor

DESC 67476 Per [redacted] Wm: Location should be 20c/11E-31B.

WATER WELL REPORT
STATE OF OREGON

RECEIVED
SEP 25 1981
WATER RESOURCES DEPT
SALEM, OREGON

State Well No. 20S/10E-31

State Permit No. .....

(1) OWNER:
Name John Mueller
Address 80938 Lost Creek Rd.
City Dexter Ore 97431 State

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary Air ☐ Driven ☐
Rotary Mud ☐ Dug ☐
[redacted] ☒ Bored ☐

(4) PROPOSED USE (check):
Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐
Thermal: ☐ Withdrawal ☐ Reinjection ☐

(5) CASING INSTALLED:
Steel ☒ Plastic ☐
Threaded ☐ Welded ☒
6 " Diam. from 0 ft. to 20 ft. Gauge .250
[redacted] " Diam. from ..... ft. to ..... ft. Gauge .....

[redacted] LINER INSTALLED:
5 " Diam. from 10 ft. to 45 ft. Gauge 1120 PVC

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☒ Yes ☐ No
Manufacturer's Name Homemade
Type 1120 PVC Model No. .....
Diam. 5 Slot Size .018 Set from 45 ft. to 70 ft.
Diam. ..... Slot Size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

[redacted] a pump test made? ☒ Yes ☐ No If yes, by whom? Driller
Yield: 6 gal./min. with 32 ft. drawdown after 72 hrs.
" " " "
Air test gal./min. with drill stem at ft. hrs.
Bailer test gal./min. with ft. drawdown after hrs.
[redacted]ian flow g.p.m.
Temperature of water 47° Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:
Special standards: Yes ☐ No ☒
Well seal—Material used Cement
Well sealed from land surface to 18 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 7 sacks
How was cement grout placed?
Appendix B
Method C
Was pump installed? no Type ..... HP ..... Depth ..... ft.
Was a drive shoe used? ☐ Yes ☒ No Plugs ..... Size: location ..... ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:
County Deschutes Driller's well number
¼ ¼ Section 31 T. 21-S R. 10-E W.M.
Tax Lot # Lot 3 Blk 8 Subdivision
Address at well location: Lazy River West

(11) WATER LEVEL: Completed well.
Depth at which water was first found 50 ft.
Static level 12 ft. below land surface. Date 9-21-81
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 5"
Depth drilled 70 ft. Depth of completed well 70 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
top soil	0	2	
brown clay & gravel	2	23	
green clay	23	40	
brown clay	40	50	
white pumice	50	55	12
black sand & gravel	55	70	12

Work started 8-21-81 19 Completed 9-21-81 19
Date well drilling machine moved off of well 9-21-81 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Larry D. Cronin Date 9-21-81
(Drilling Machine Operator)
Drilling Machine Operator's License No. 1426

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Cronin Well Drilling Co.
(Person, firm or corporation) (Type or print)
Address 52594 Deer Field Dr. LaPine Ore 97739
[Signed] Clifford Dale Cronin
(Water Well Contractor)
Contractor's License No. 666 Date 9-21-81, 19

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

SP*12658-690

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

DESC 6451

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

DESC 6451

State Well No. 20s/11E-31bb

State Permit No.

(1) OWNER:
Name R. N. Davison
Address 62996 Rattlesnake Rd.
Dexter, Ore. 97431

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☒

(4) PROPOSED USE (check):
Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☐ Welded ☒
6 " Diam. from 0 ft. to 53 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? ☒ Yes ☐ No.
Type of perforator used Torch
Size of perforations 1/8 in. by 6 in.
140 perforations from 53 ft. to 63 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☒ Yes ☐ No
Manufacturer's Name Simpson
Type Plastic Model No. 160PSI
Diam. 6 Slot size 1/8 Set from 53 ft. to 63 ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? Driller
Yield: 16 gal./min. with 30 ft. drawdown after 8 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 18 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 8½ sacks
How was cement grout placed? pressure grout
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Deschutes Driller's well number
NW ¼ NW ¼ Section 31 T. 20S R. 11E W.M.
Bearing and distance from section or subdivision corner
Lazy River West Lodgepole

(11) WATER LEVEL: Completed well.
Depth at which water was first found 43 ft.
Static level 22 ft. below land surface. Date 5-24-79
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing
Depth drilled 63 ft. Depth of completed well 63 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Top Soil	0	3	
Plumice	3	5	
Clay	5	9	
Clay & Gravel/hard	9	22	
Clay-Soft/grey	22	43	
Clay-hard & dry	43	53	22
Gravel-fine with sand	53	63	

RECEIVED
JUN 7 1979
WATER RESOURCES DEPT.
SALEM, OREGON

Work started 5-24 19 79 completed 5-24 19 79
Date well drilling machine moved off of well 5-24 19 79

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Michael Froden (Drilling Machine Operator) Date 6-5, 19 79
Drilling Machine Operator's License No. 917

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Mike's Well Drilling (Person, firm or corporation) (Type or print)
Address 84851 Froden Lane Pleasant Hill, Ore. 97401
[Signed] Michael Froden (Water Well Contractor)
Contractor's License No. 620 Date 6-5, 19 79

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*4565&-119

DESC 6451

WELL IDENTIFICATION APPLICATION FORM

RECEIVED
MAY 29 1997
WATER RESOURCES DEPT.
SALEM, OREGON

BUYER/CURRENT WELL OWNER:

Name: H. D. and Marlys Lairson

Mailing Address: 21401 NE Sandy Blvd.

City: Portland State: OR Zip: 97707 Phone: (503) 618-7841

DESC 6451

WELL LOCATION:

County: Deschutes Township: 20 N or (S) Range: 11 (E) or W

Section: 31 NW 1/4 NW 1/4 Owner's Well Number: 20S/11E-31bb

Tax Lot Number: 06900 Street Address of Well (if different from above):

17286 Lodgepole Lane, Bend, OR 97707

WELL INFORMATION: (do not complete remainder of application if well log is available)

Start Card Number: _____ Approx. Construction Date: _____

Well Constructor: _____

Name of Owner at Time of Construction: _____

Well Depth (in feet): _____ Static Water Level (in feet): _____

Diameter of Exposed Well Casing (in inches): _____

Does this well have a formal water right associated with it? Yes: _____ No: _____

If Yes: Application #: _____ Permit #: _____ Certificate #: _____

Please Return Completed Form to:

Lisa Juul
Well Identification Program
Oregon Water Resources Department
158 12th Street NE
Salem, OR 97310

For Official Use Only:

Well Tag No. 13355

M:\wellid.app

DESC 59324

08-23-2011

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 104508

START CARD # 1014510

(1) LAND OWNER

Owner Well I.D. _____

First Name ANGELA Last Name Rhinehold

Company _____

Address 17285 LODGEPOLE

City BEND State OR Zip 97707

(2) TYPE OF WORK

☒ New Well ☐ Deepening ☐ Conversion
☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD

☐ Rotary Air ☐ Rotary Mud ☒ Cable ☒ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other _____

(4) PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Community
☐ Industrial/ Commericial ☐ Livestock ☐ Dewatering
☐ Thermal ☐ Injection ☐ Other _____

(5) BORE HOLE CONSTRUCTION

Special Standard ☐ (Attach copy)

Depth of Completed Well 229.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
11	0	20	Bentonite Chips	0	20	10	S
6	20	229					

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E

☒ Other poured

Backfill placed from _____ ft. to _____ ft. Material _____

Filter pack from _____ ft. to _____ ft. Material _____ Size _____

Explosives used: ☐ Yes Type _____ Amount _____

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	6	☒	1	229	250	●	○	☒	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐

Shoe ☐ Inside ☐ Outside ☐ Other Location of shoe(s) _____

Temp casing ☐ Yes Dia _____ From _____ To _____

(7) PERFORATIONS/SCREENS

Perforations Method orch

Screens Type _____ Material _____

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Casing	.5	225	229	.4	.6	30	

(8) WELL TESTS: Minimum testing time is 1 hour

● Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
25	.6	12	2

Temperature 52 °F Lab analysis ☐ Yes By _____

Water quality concerns? ☐ Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County Deschutes Twp 20.00 S N/S Range 11.00 E E/W WM

Sec 31 NW 1/4 of the NW 1/4 Tax Lot 4400

Tax Map Number _____ Lot _____

Lat ° ' " or _____ DMS or DD

Long ° ' " or _____ DMS or DD

● Street address of well ○ Nearest address

17285 LODGEPOLE
BEND, OR. 97707

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening			☐	
Completed Well	08-22-2011		☐	11

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 5

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
08-10-2011	5	9	7		☐	5
					☐	
08-11-2011	55	67	20		☐	20
					☐	
08-22-2011	225	229	100		☐	11

(11) WELL LOG

Ground Elevation _____

Material	From	To
soil and pumice	0	4
gravel	4	10
pink ash	10	25
green diatamite	25	55
gray ash	55	62
fine black sand	62	67
gray ash	67	110
green diatamite	110	180
pink ash	180	225
white pumice	225	229

Date Started 08-10-2011 Completed 08-23-2011

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number _____ Date _____

Electronically Filed

Signed _____

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1528 Date 08-23-2011

Electronically Filed

Signed STEVE W MATHERS (E-filed)

Contact Info (optional) _____

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

Form Version: 0.95

DESC50156

RECEIVED
MAR 20 1996
WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

(START CARD) # W-86422

Instructions for completing this report are on the last page of this form.

(1) OWNER: Well Number _____
Name Kim Russell
Address 51865 Pine Lp
City LaPine State OR Zip 97739

(2) TYPE OF WORK
☑ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☑ Cable ☐ Auger
☐ Other _____

(4) PROPOSED USE:
☑ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other _____

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☑ No Depth of Completed Well 27 ft.
Explosives used ☐ Yes ☑ No Type _____ Amount _____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10	0	18	Hole Plug	0	18	300 LBS
6	18	27				

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☐ Other _____
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6	+1	20	250	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	5	7	27	160	☐	☑	☑	☐
					☐	☐	☐	☐

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
☑ Perforations Method Saw cut
☐ Screens Type _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
20	27	020	500	5		☐	☑
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
4	20		4 hr

Temperature of water 43 Depth Artesian Flow Found _____
Was a water analysis done? ☐ Yes By whom _____
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other NO
Depth of strata: _____

(9) LOCATION OF WELL by legal description:
County Deschutes Latitude _____ Longitude _____
Township 20-S N or S Range 11-E E or W. WM.
Section 31B NW 1/4 NW 1/4
Tax Lot 4400 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 17285 Lodge Pole Bend, OR

(10) STATIC WATER LEVEL:
3 ft. below land surface. Date 3-12-96
Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
Depth at which water was first found 3

From	To	Estimated Flow Rate	SWL
3	27	2-3 gpm	3

(12) WELL LOG:
Ground Elevation _____

Material	From	To	SWL
Prmnce Soil	0	3	3
Sand gravel Mud	3	19	
fine sand Brown	19	27	

Date started 3-12-96 Completed 3-12-96

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number _____
Signed _____ Date _____

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWS Number 1559
Signed _____ Date 3-14-96

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

DESC 61567

6/4/2019

WELL I.D. LABEL# L 126513
START CARD # 1037538
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name WILLIAM Last Name LOWERY
Company
Address 20935 FRANCINE LANE
City CHATSWORTH State CA Zip 91311-8379

(2) TYPE OF WORK

☒ New Well ☐ Deepening ☐ Conversion ☐ Alteration (complete 2a & 10) ☐ Abandonment(complete 5a)

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD

☐ Rotary Air ☐ Rotary Mud ☒ Cable ☐ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other

(4) PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Community
☐ Industrial/ Commericial ☐ Livestock ☐ Dewatering
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION

Special Standard ☐ (Attach copy)
Depth of Completed Well 208.00 ft.

BORE HOLE

Dia	From	To
10	0	20
6	20	208

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	20	13	S
		Calculated	9.4	
		Calculated		

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other 3 MINUTE POUR PER
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
Explosives used: ☐ Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	6	☒	1	208	.250	●	○	☒	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐
○	○		☐				○	○	☐	☐

Shoe ☐ Inside ☐ Outside ☐ Other Location of shoe(s)
Temp casing ☐ Yes Dia From + ☐ To

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Material

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

(8) WELL TESTS: Minimum testing time is 1 hour

● Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
18	34	49	2

Temperature 42 °F Lab analysis ☐ Yes By
Water quality concerns? ☐ Yes (describe below) TDS amount 191 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 11.00 E E/W WM
Sec 31 NW 1/4 of the NW 1/4 Tax Lot 4700
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
● Street address of well ○ Nearest address
55140 TAMARACK BEND

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	1/12/2018			15

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 9.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
1/12/2018	9	14	5			8
1/12/2018	207	208	18			15

(11) WELL LOG

Ground Elevation

Material	From	To
pummie	0	3
brown sand	3	9
gravel	9	14
gray clay	14	204
purple clay	204	207
course pumice	207	208

Date Started 1/9/2018 Completed 1/12/2018

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number Date

Signed

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1614 Date 6/4/2019

Signed SAM OLSON (E-filed)

Contact Info (optional) 541-536-5339

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version:

Appendix F.

RidNOx™ and Lysimeter Installation, and Sampling Instructions

ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

RidNOx Installation Instructions

RidNOx Installation

1. Excavate to a depth that will result in the top of the RidNOx tank being at the same elevation as the existing ground surface.
2. Prepare a level, stable base.
3. Set the body of the tank in the hole.
4. Prepare and install inlet and outlet fittings as shown on the approved plans.
5. Place a 2-inch layer of ½ to ¾-inch round rock on the floor of the tank.
6. Cover the slotted outlet pipe with the same rock to a minimum depth of 2 inches.
7. Install the clean wood media (playground chips meeting ASTM F2075) in 6 inch lifts, walking in each lift to compress the media, to the bottom of the outlet fitting.
8. Set the lid on the tank. **Do not use mastic.**
9. Backfill the tank to 6 inches below the seam between the body and the lid.
10. Place underdrain media to the top of the tank.
11. Backfill over the tank with native soil after the risers are attached.

Media Replacement

- Pothole near tank to make sure the water table is at least 30” below the top of the tank to prevent buoyancy during replacement operations.
- Carefully remove the soil cover from over and around the tank to a level below the seam.
- Carefully remove the lid from the tank.
- Use a sump pump to transfer free water from the media to the pump basin.
- Scoop the media from the tank being careful not to damage the inlet and outlet piping or the underdrain media.
- After the excess moisture drains from the spent media, it can be loaded into a dump truck and hauled to a sanitary landfill.
- Install fresh media and re-install the lid as described in steps 7 through 11 above.

ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

Lysimeter Installation Instructions

Lysimeter Installation in a Bottomless Sand Filter

- Remove duff and surface soil layer (typically 6 inches) to provide an infiltrative surface free of roots.
- When installing sampling devices (trough lysimeters), carefully mark the location of the orifice positions on each side of the sand filter container.
- Also mark the target elevations for each layer on the walls.
- Install the lower layer of medium sand and the underdrain media.
- Remove enough underdrain media from a 4-inch wide strip (trough) across the bottom aligned with a row of orifices (typically the 4th row from either end).
- With an auger or a tile spade, dig a hole at one end of the trough large enough and deep enough to set the vertical part of the lysimeter against the wall.
- Fine-grade the placement of the body of the lysimeter with the horizontal fitting of the sanitary tee aligned with the trough.
- Bed the half pipe with a slight slope (no more than 1 inch in 10 feet) toward the body of the lysimeter.
- Glue one end of the half pipe into the coupler extending from the sanitary tee with a cap glued at the opposite end.
- Place about one-half inch of underdrain media (pea gravel) in the bottom of the trough with enough ramped up inside the sanitary tee to cover the drilled holes in the debris cap.
- Backfill around the lysimeter with pea gravel to provide drainage from the self-emptying port.
- Secure the body of the lysimeter to the wall with a metal strap or other device to stabilize it during the placement of the various layers of media.
- The rest of the sand filter will be constructed in a customary fashion.

ELKHORN CONSULTING LLC

14833 Goodrich Creek Lane
Baker City, OR 97814 • 503-881-1604
elkhornconsultingllc@gmail.com

RidNOx and Bottomless Sand Filter Sampling Instructions

General

- Contact the laboratory to coordinate scheduling and acquire sample containers,
- Target parameters are total Kjeldahl nitrogen (TKN) and nitrate-nitrogen (NO_3-N).
- Make sure you have the proper sampling equipment, chain-of-custody forms, and a cooler with ice.
- Label all sample bottles in advance.

RidNOx Sampling Procedures

- Remove the lid from the pump basin.
- Use a bailer, peristaltic pump, or other appropriate sampler, to carefully collect a sample from the pump basin without disturbing and attached growth on the surfaces of pipes, floats, etc.
- Transfer sample into sample bottles.
- Repeat as necessary until all bottles are filled.
- Secure the caps on each bottle and place them immediately in a cooler with ice.
- Deliver samples to the laboratory (nitrate-nitrogen samples need to be analyzed within **48 hours** of sample collection).

Lysimeter Sampling Procedures (if/when desired)

- Loosen the square nut plug on the lysimeter.
- Shine a flashlight down the pipe to confirm the presence of filtrate.
- Use a bailer (disposable or cleaned) on a string to collect sample from the body of the lysimeter.
- Transfer sample into sample bottles.
- Repeat as necessary until all bottles are filled.
- Secure the caps on each bottle and place them immediately in a cooler with ice.
- Replace the square nut plug.
- If funding allows, collect sample of the AdvanTex-treated effluent as it flows into the RidNOx unit at the inlet of the tank.
- Deliver samples to the laboratory (nitrate-nitrogen samples need to be analyzed within **48 hours** of sample collection).

Appendix G.

Directions to Site, List of Names and Addresses for Neighboring Property Owners

Google Maps

Department of Environmental Quality, Bend office
475 NE Bellevue Dr # 110, Bend, OR 97701

Take NE Bellevue Dr and NE Dalton St to US-20

1 min (0.2 mi)

1. Head southwest toward NE Bellevue Dr

43 ft

2. Turn right toward NE Bellevue Dr

46 ft

3. Turn right toward NE Bellevue Dr

233 ft

4. Turn right onto NE Bellevue Dr

240 ft

5. Turn right onto NE Dalton St

367 ft

Take US-97 S to Vandevert Rd

25 min (19.8 mi)

6. Turn right onto US-20
   Pass by Wells Fargo Bank (on the left in 0.4 mi)

2.3 mi

7. Continue straight onto NE Greenwood Ave

0.3 mi

8. Turn left onto NW Hill St

0.1 mi

9. Turn left onto NW Hawthorne Ave

413 ft

10. Turn right onto US-97 S

16.9 mi

Continue on Vandevert Rd. Take S Century Dr and Lazy River Dr to Lodgepole Ln

9 min (4.2 mi)

11. Slight right onto Vandevert Rd

1.0 mi

12. Turn left onto S Century Dr

1.1 mi

13. Turn right to stay on S Century Dr

0.5 mi

14. Turn left onto Lazy River Dr

1.1 mi

15. Turn right onto Lodgepole Ln
    Destination will be on the right

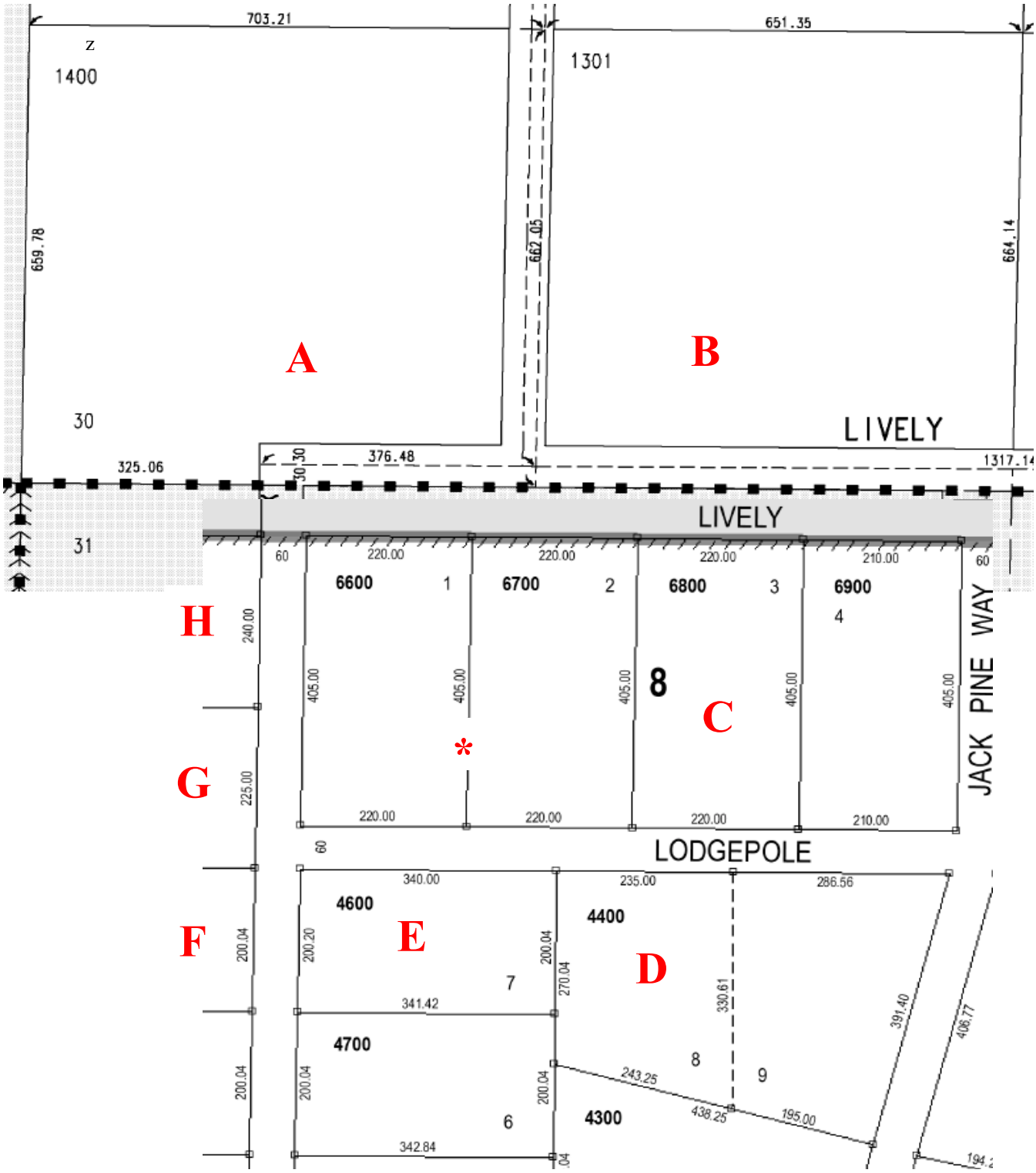
0.4 mi

17256 Lodgepole Ln
Bend, OR 97707

Adjacent Parcels Property Owners

17256 and 17262 Lodgepole Lane, Bend, Oregon
(T20S, R11E, Section 31B, Tax Lot 6700, 2.03 acres)

* Tax Lot	6600 & 6700	Schwartz, Aaron & Dantzker, Elizabeth 1017 SE 22nd Ave Portland, OR 97217
A. Tax Lot	1400	Shue Revocable Trust 5737 Doverton Way Chino Hills, CA 91709
B. Tax Lot	1301	Marshall Homestead, LLC PO Box 5665 Bend, OR 97708
C. Tax Lot	6800	Nasratyar, Zahir & Christina Marlena 6552 Doral Dr Huntington Beach, CA 92648
D. Tax Lot	4400	Rinehold, Angella 61188 SLEEPY CT Bend, OR 97702
E. Tax Lot	4600	Hulstrom, Blaine & Lisette 7714 SW Barns Rd #Unit A Portland, OR 97225
F. Tax Lot	6300	RJL LLC 1303 SE Armour Rd Bend, OR 97702
G. Tax Lot	6400	Gillilan, James S & Amy M 60586 Robinette Rd Saint Helens, OR 97051
H. Tax Lot	6500	Gillilan, James Scott & Amy Marie & Lisette 60586 Robinette Rd Saint Helens, OR 97051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