Oregon
Tina Kotek, Governor

Department of Environmental Quality
Eastern Region Bend Office
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Bend, OR 97701
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August 1, 2025

Robert & Dina Laskey
1022 Clark Street
North Bend, OR 97459

Re: WQ: Variance Approval: 248-25-000014-VAR: 17091 Merced Rd; T.20S; R.10E; Sec. 13A; Tax Lot 14500; 0.51 Acres; Deschutes County.

Dear Robert and Dina Laskey,

This correspondence verifies that a variance hearing provided for under Oregon Administrative Rules 340-071-0430, was held on the site at 1:15 pm on June 2, 2025, for the subject property referenced above on Merced Road 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 9-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 9- 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 3 test pits within the subject property on September 17, 2024, where a denial was issued for the use of an onsite wastewater system on September 19, 2024. 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 17- inches and 21-inches below ground surface (bgs).

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

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
Holland Revocable Trust, PO Box 3033, Bend, OR 97707
Gregory D. and Tereasa L. Broxson, PO Box 4803, Sunriver, OR 97707
Ronald E. and Kerry E. Snook, 61248 Brookhollow Dr., Bend, OR 97702
GMS Living Trust, PO Box 3425, Sunriver, OR 97707
Christopher and Andrea Palle, 61535 S Highway 97 #5-633

Schedule A – Laskey
Variance Report - Special Conditions
T 20S, R 10E, Sec: 13A, TL 14500

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 17091 Merced Road; T.20S; R.10E; Sec. 13A; Tax Lot 14500; 0.51 Acres; 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.

ELKHORN CONSULTING LLC

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RECEIVED
JAN 16 2025
DEQ
Eastern Region Bend

January 7, 2025

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

SUBJECT: Formal Variance Request – Robert and Dina Laskey et al – T20S, R10E, Section 13A, Tax Lot 14500 (0.51 acres), 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 17091 Merced Road, south of Bend in Deschutes County, Oregon (Site) (Figure 1) and consists of 0.505 acres. A Tax Lot map is attached in Appendix A and a copy of the Deed is attached in Appendix B.

Background

Deschutes County conducted a site evaluation on September 24, 1998, that was denied as inconclusive until spring water table measurements could be made in a normal year. Observations were made in March of 2000, and water was observed as shallow as 16 inches below the ground surface (in Test Pit 1 and in an auger hole closer to the southeast corner of the lot) and a denial was issued on April 5, 2000. It is important to note that the recorded water levels rose and fell relatively quickly from 23 to 28 inches on March 10, to 16 inches on March 17, and then back down to 20 to 23 inches on March 23, 2000.

Deschutes County conducted a new site evaluation on September 17. 2024, and a denial was issued on September 19, 2024. The denial was based on conditions associated with saturation noted at 17 to 21 inches below the ground surface in 3 test pits. Test Pit 3 represented the best conditions and was in the southeast corner of the lot. The other test pits were 70 feet northwest and about 75 feet to the north along the eastern boundary of the lot. 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.

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 onsite rules require a minimum of 24 inches of separation from the upper limit of the water table to the bottom of a bottomless sand filter as well as being 24 inches below the ground surface.

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

Soils

The web soil survey shows the location of the Site and a copy of the output from the web soil survey is provided in Appendix D. The entire parcel is shown within a delineation of Map Unit 144A, Sunriver sandy loam 0 to 3 percent slopes. Sunriver soils are described as very deep, somewhat poorly drained soils that formed on pumice mantled stream terraces. The typical profile generally consists of the following:

- Up to 2 inches of organic material underlain by,
- 5 inches of very dark gray ashy sandy loam underlain by,
- 15 inches of dark gray ashy loamy coarse sand underlain by,
- 9 inches of light brownish gray ashy coarse sand underlain by,
- 31 inches of very dark gray sandy loam.

The Sunriver series is described as having a water table that rises to about 2 to 4 feet below the surface from April to June.

The characteristics observed at the Site are reasonably similar to the Sunriver series. The primary differences between the conditions noted in the 2024 soil notes and the conditions typical for the Sunriver series are related primarily to coloration (browner colors) that are more indicative of the Shanahan series.

Preliminary Assessment

The Site was reviewed by Brian Rabe, CPSS, WWS, on November 22, 2024. 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 3 in the 2024 site evaluation (southeastern part of the lot - 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 13 of Township 20 South, Range 10 East of the Willamette Meridian). There are about 393 records on file for this section. A total of 19 water well records (well logs) were identified in Section 13 that could be tied to specific parcels within about one-eighth of a mile of the subject property (Appendix E). The following is a summary of each of those reports.

The closest existing well is on Tax Lot 14600 and is about 120 feet northeast of the proposed bottomless sand filter area. The well is still shown as "proposed" on a Certificate of Satisfactory

Completion for the sand filter system from 2001 but no record of the well could be found in the Water Resources database.

The closest existing well is on Tax Lot 14400 (incorrectly referred to as 4400 by the driller) and is about 170 feet west of the proposed bottomless sand filter area. This well was completed on October 4, 2022, to a depth of 71 feet. Water was described as being first found at a depth of 11 feet in a layer of "brown sand fine" but was sealed off. The next water bearing zone was found at a depth of 65 feet in a layer of "cinders" and had a static water level of 18 feet bgs on the date of completion with a reported yield of 15 gpm after 2 hours of pumping.

The next closest existing well is on Tax Lot 12800 (incorrectly referred to as 2900 by the driller) and is about 180 feet south-southwest of the proposed bottomless sand filter area. This well was completed on November 13, 2022, to a depth of 72 feet. Water was described as being first found at a depth of 65 feet in a layer of "cinders black sand mix" and had a static water level of 19 feet bgs on the date of completion with a reported yield of 16 gpm with 6 feet of drawdown after 2 hours with a pump.

Another well is about 180 feet west of the proposed bottomless sand filter area on Tax Lot 14300. This well was completed on October 5, 2015, to a depth of 77 feet. Water was described as being first found at a depth of 8 feet in a layer of "Brown sand course" but was sealed off. The next water bearing zone was found at a depth of 68 feet in a layer of "Sand and gravel" and had a static water level of 17 feet bgs on the date of completion with a reported yield of 15 gpm with 12 feet of drawdown after 2 hours with a pump.

There is a well on Tax Lot 12700 about 200 feet south-southeast of the proposed bottomless sand filter area but no well log could be found. A previous well on that property was abandoned in 1995. According to the abandonment record the previous well was 54 feet deep.

The well for Tax Lot 12900 is about 230 feet south-southwest of the proposed bottomless sand filter area. This well was completed on June 10, 1995, to a depth of 74 feet. Water was described as being first found at a depth of 9 feet in a layer of "sand gravel." This layer was sealed off and the next water was described as being found at a depth of 72 feet in a layer of "coarse cinders" and had a static water level of 15 feet bgs on the date of completion with a reported yield of 10 gpm with 6 feet of drawdown after 24 hours with a pump.

The well for Tax Lot 18700 is about 290 feet northeast of the proposed bottomless sand filter area. This well was completed on May 30, 1996, to a depth of 76 feet. Water was described as being first found at a depth of 65 feet in a layer of "cinders sand" and had a static water level of 21 feet bgs on the date of completion with a reported yield of 18 gpm with 4 feet of drawdown after 4 hours with a pump.

The well for Tax Lot 20600 is more than 300 feet east to southeast of the proposed bottomless sand filter area on a lot developed only with a shop. This well was completed on May 2, 2019, to a depth of 80 feet. Water was described as being first found at a depth of 70 feet in a layer of "black sand" and had a static water level of 20 feet bgs on the date of completion with a reported yield of 10 gpm with 30 feet of drawdown after 24 hours with a pump.

The well for Tax Lot 12500 is about 330 feet south-southwest of the proposed bottomless sand filter area. This well was completed on September 19, 1999, to a depth of 77 feet. Water was described as being first found at a depth of 71 feet in a layer of "sand + gravel" and had a static water level of 9 feet bgs on the date of completion with a reported yield of 20 gpm with 12 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 20800 is about 350 feet southeast of the proposed bottomless sand filter area. This well was completed on September 2, 1979, to a depth of 80 feet. Water was described as being first found at a depth of 73 feet in a layer of "Black sand & gravel med" and had a static water level of 12 feet bgs on the date of completion with a reported yield of 30 gpm with 11 feet of drawdown after 1 hour with a bailer.

The well for Tax Lot 13200 is more than 360 feet west to southwest of the proposed bottomless sand filter area on a lot developed only with a shop. This well was completed on September 24, 2020, to a depth of 86 feet. Water was described as being first found at a depth of 9 feet in a layer of "Course gravel" but was sealed off. The next water bearing zone was found at a depth of 75 feet in a layer of "Course black sand with gravel" and had a static water level of 18 feet bgs on the date of completion with a reported yield of 12 gpm with 7 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 12300 is about 390 feet southwest of the proposed bottomless sand filter area. This well was completed on September 25, 2023, to a depth of 78 feet. Water was described as being first found at a depth of 75 feet in a layer of "course pumice" and had a static water level of 20 feet bgs on the date of completion with a reported yield of 25 gpm with 8 feet of drawdown after 2.5 hours with a pump.

The well for Tax Lot 14900 is about 410 feet north-northwest of the proposed bottomless sand filter area. This well was completed on September 13, 2012, to a depth of 77 feet. Water was described as being first found at a depth of 3 feet in a layer of "sand and gravel" but was sealed off. Water was next found at a depth of 66 feet in a layer of "Black sand and gravel course" and had a static water level of 12 feet bgs on the date of completion with a reported yield of 21 gpm with 4 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 21000 is about 540 feet southeast of the proposed bottomless sand filter area. This well was completed on August 9, 2005, to a depth of 77.5 feet. Water was described as being first found at a depth of 10 feet in a layer of "Brown sand fine" but this layer was sealed off. Water was next found at a depth of 70 feet in a layer of "Black sand coarse" and had a static water level of 14 feet bgs on the date of completion with a reported yield of 18 gpm with 25 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 10900 is about 550 feet south-southwest of the proposed bottomless sand filter area. This well was completed on June 15, 2006, to a depth of 77 feet. Water was described as being first found at a depth of 72 feet in a layer of "blk sand" and had a static water level of 10 feet bgs on the date of completion with a reported yield of 20 gpm with 10 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 16500 is about 560 feet north of the proposed bottomless sand filter area. This well was completed on May 27, 2020, to a depth of 78 feet. Water was described as being first found at a depth of 73 feet in a layer of "fine black sand" and had a static water level of 17 feet bgs on the date of completion with a reported yield of 25 gpm with 30 feet of drawdown after 1 hour with a pump.

The well for Tax Lot 20300 is about 575 feet southeast of the proposed bottomless sand filter area. This well was completed on March 4, 2016, to a depth of 90 feet. Water was described as being first found at a depth of 85 feet in a layer of "gravel" and had a static water level of 8 feet bgs on the date of completion with a reported yield of 25 gpm with 3 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 13300 is about 580 feet west-southwest of the proposed bottomless sand filter area. This well was completed on April 30, 2008, to a depth of 75 feet. Water was described as being first found at a depth of 10 feet in a layer of "brown sand" but that layer was sealed off. Water was next found at a depth of 70 feet in a layer of "coarse sand" and had a static water level of 15 feet bgs on the date of completion with a reported yield of 20 gpm with 40 feet of drawdown after 2 hours with a pump.

The well for Tax Lot 13900 is about 660 feet west-northwest of the proposed bottomless sand filter area. This well was completed on September 14, 2002, to a depth of 80 feet. The water bearing zone is described at a depth of 56 to 58 feet in a layer of "gray diatomite" but the well casing was perforated between 75 and 78 feet bgs in a layer of "blk sand." The static water level was 12 feet bgs on the date of completion with a reported yield of 15 gpm with 3 feet of drawdown after 1 hour 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 7, which recommends a 79% to 100% reduction from the base scenario loading (standard systems) for existing homes and a 0% to 10% reduction for 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 0.51 milligrams per liter (mg/L) with 7.58% exceeding 3 mg/L and none exceeding 10 mg/L (based on 211 test results, viewed on January 4, 2025).[3]

[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 January 4, 2025, from ARC GIS Online: https://www.arcgis.com/apps/MapSeries/index.html?appid=c0d7daea497049c1a686d07dab7106e5

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).

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 southeast part of the parcel. This represents an area with the appropriate spatial footprint and meets all required horizontal setback requirements.

Test Pit 3 (2024) was described as:

- Very dark grayish brown (10YR 3/2) coarse sandy loam from 0 to 6 inches with weak medium subangular blocky structure; common fine, medium, and coarse roots; underlain by
- Dark brown (10YR 3/3) loamy coarse sand from 6 to 23 inches, structureless (single grain), with common medium roots and redoximorphic features (stripping) beginning at 21 inches; underlain by
- Very dark grayish brown (10YR 3/2) coarse sandy loam from 23 to 36 inches with weak coarse subangular blocky structure; no roots; with redoximorphic features (iron concentrations) throughout; underlain by
- Very dark gray (10YR 3/1) sand from 36 to 53 inches with no roots, and redoximorphic features (iron concentrations) throughout.

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 Test Pit 3 (2024). 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 21 inches to the redoximorphic features described in Test Pit 3 (2024).

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 9 inches of sand filter media (total of 15 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. Even if the water table rises above the level of the redoximorphic features, as occurred briefly during the spring 2000 monitoring for a previous site evaluation, this proposal would still provide a vertical separation of 25 inches. 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.

This appears to be one of the first variance applications in Management Area 7. It is assumed that the results of the Nitrate Management Loading Model indicated there was at least some capacity within Management Area 7 to accommodate additional lots that were denied or otherwise not expected to be approved.

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. In this instance, the same group of people own the lot to the west (17077 Merced Road) and intend

[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.

to combine the lots if this variance is approved. It is assumed that two thirds of the combined lots will be developed (home, outbuildings, driveway, yard, etc.) and the other third 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 0.33 acres (one third of a one acre lot) is 1.6 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: Robert and Dina Laskey
Todd Cleveland, REHS – Deschutes County

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

FIGURES

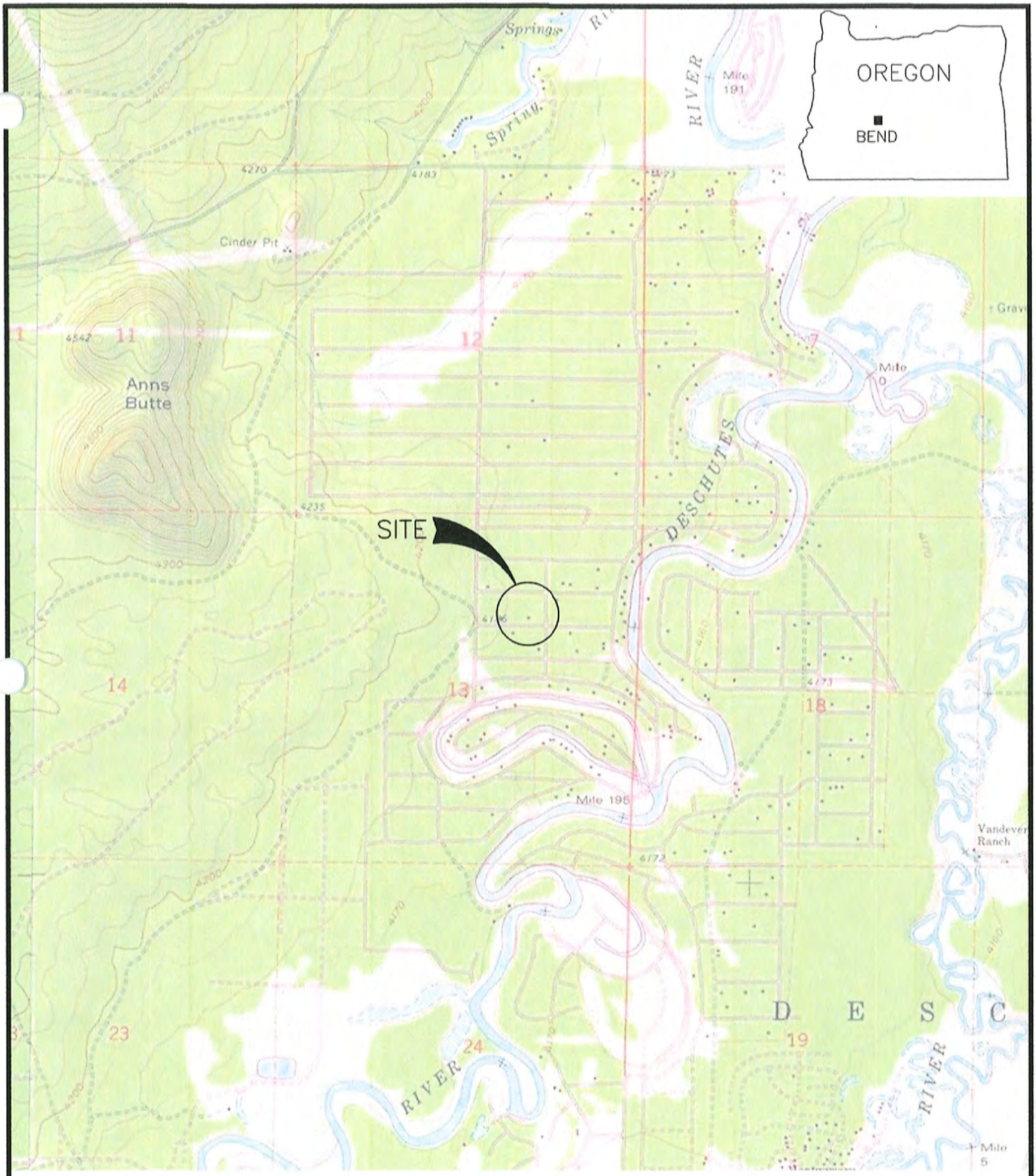

Figure 1. Vicinity Map

0 2,000'

1" = 2,000'

(LOCATIONS AND SCALE ARE APPROXIMATE)

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

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
DATE: 1/6/2025	
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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TAX LOT 1500D
DENIED (2005)

TAX LOT 14900
TDC LOT (2003)
NOT SEPTIC
ELIGIBLE

TAX LOT 14800
NO RECORDS

TAX LOT 14700
DENIED (2000)

17077 AND 17091 MERCED ROAD

TAX LOT 14300
DENIED (1978)

TAX LOT 14400

T20S, R10E,
SECTION 13A,
TAX LOT 14500

TAX LOT 14600
SAND FILTER
(2000)

Ⓦ

100'
SETBACK

50'
SETBACK

PROPOSED
HOUSE
(60'x60')

PROPOSED
GARAGE
(36'x40')

5' MIN.

RidNOx™
UNIT

PROPOSED 1,500
GAL. SEPTIC TANK

PROPOSED ADVANTEX
AX20N (MODE 3B)
TREATMENT SYSTEM

50' TANK
SETBACK

100' SAND
FILTER
SETBACK

PROPOSED
EXTERNAL
PUMP BASIN

TEST PIT 2
(2024)

10'

PROPOSED 10'x25'
MODIFIED BOTTOMLESS
SAND FILTER

PROPOSED 10'x25'
REPLACEMENT AREA

15'

15'

COMET DRIVE

TAX LOT 13000
DENIED (1994)

TAX LOT 12900
OLD STANDARD
SYSTEM UPGRADED
TO ATT + MBSF
– MAJOR
ALTERATION (2020)

TAX LOT 12800
APPROVED FOR
ATT + 250FT^2
BSF (2022)
PERMIT ISSUED
(2023) AND
EXTENDED (2024)

TEST PIT 3
(2024)

TAX LOT 12700
SAND FILTER
(1995)

N

0 40'

1"=40'

(SCALE AND LOCATIONS
ARE APPROXIMATE)

Figure 2. Site Plan

PROJECT NUMBER: 2024038	Formal Variance
DATE: 1/6/2025	T20S, R10E, Section 13A, Tax Lot 14500
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	17091 Merced Road
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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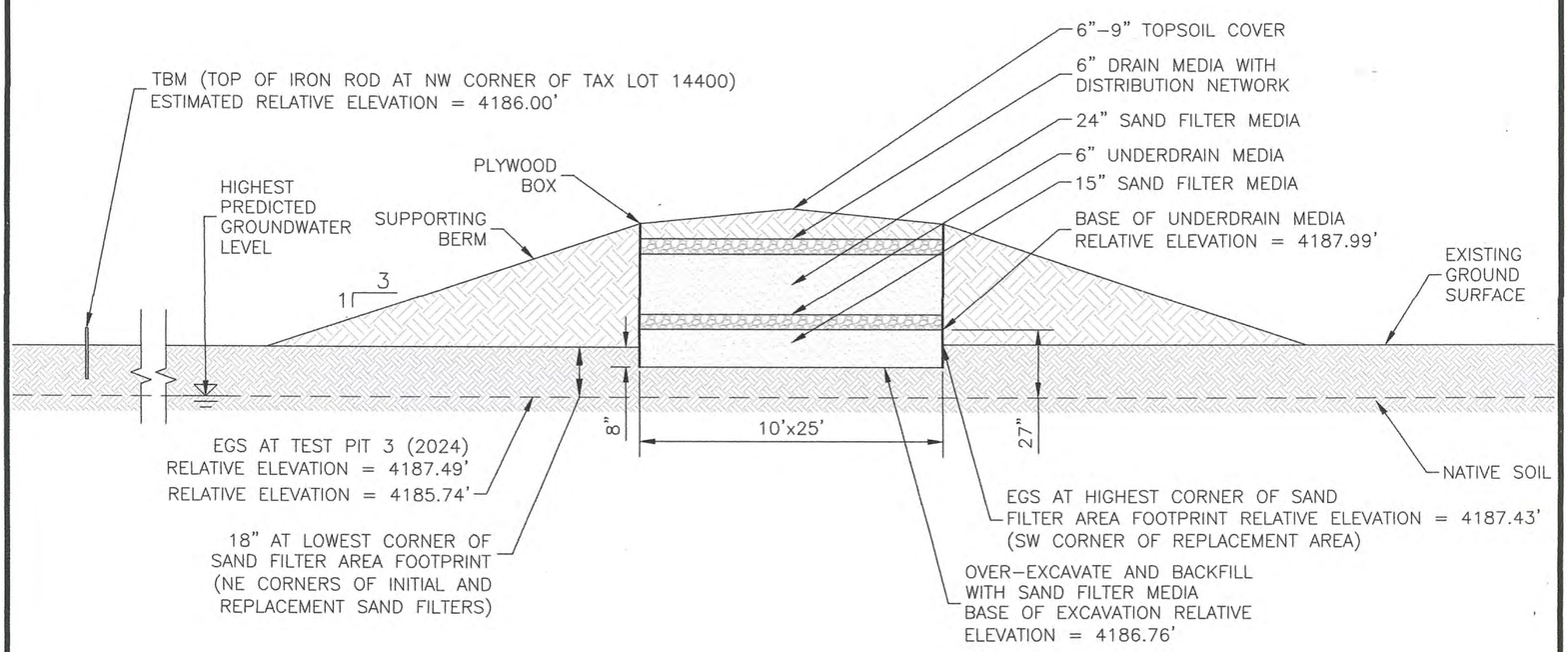

Figure 3. Modified Bottomless Sand Filter Section

0 5'

1"=5'

PROJECT NUMBER: 2024038	Formal Variance
DATE: 1/6/2025	T20S, R10E, Section 13A, Tax Lot 14500
DWG NO: 2024038 F1–6.DWG	Robert & Dina Laskey and Lyon Investments LLC
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	17091 Merced Road
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

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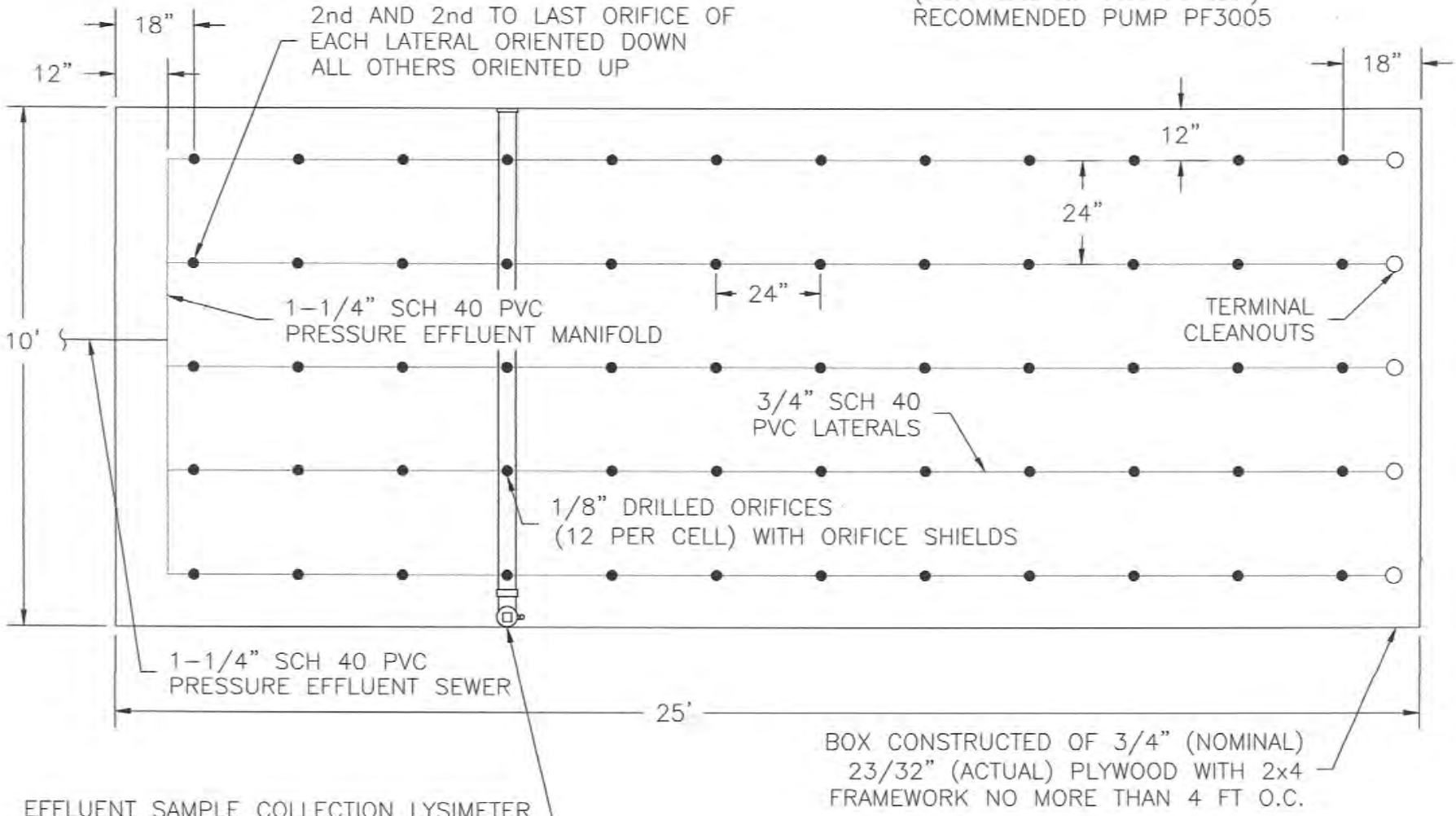

Figure 4. Sand Filter Plan Detail

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
DATE: 1/6/2025	
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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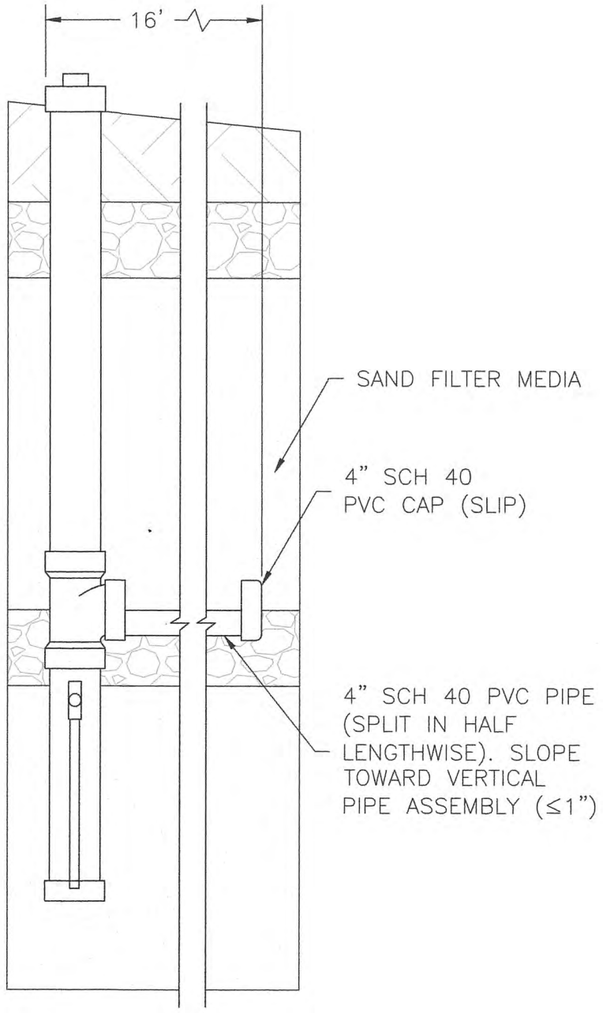
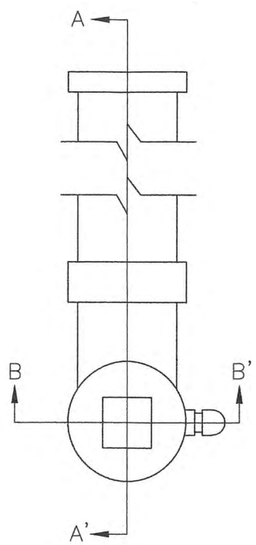


VIEW A–A'

0 1'

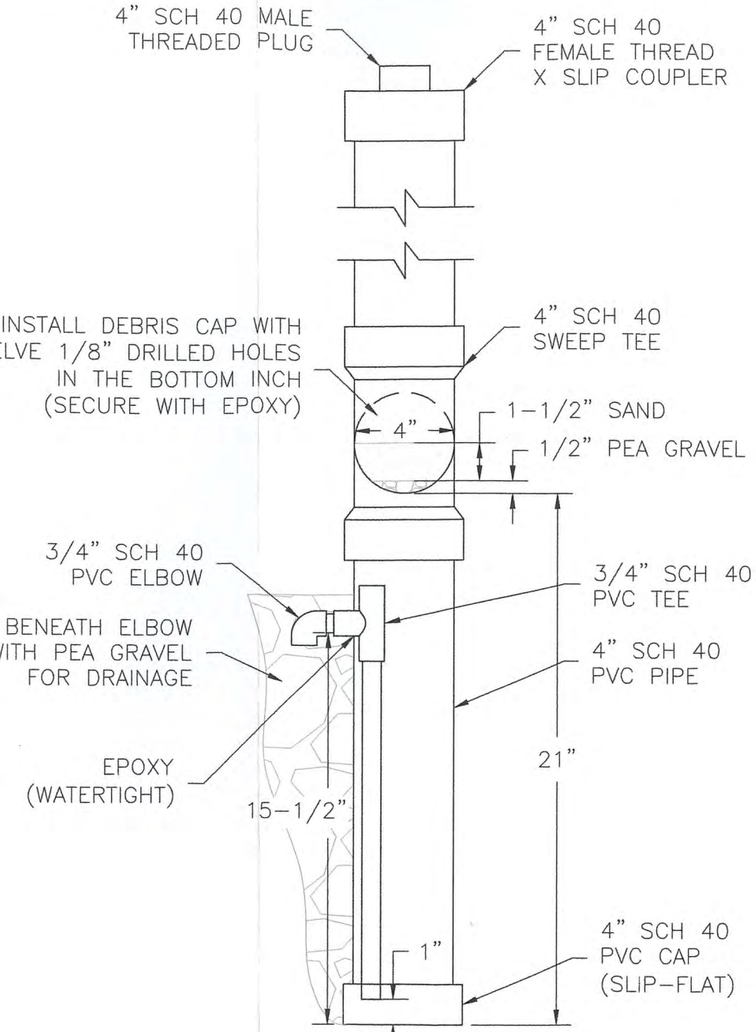
1"=1'



PLAN VIEW

0 0.5'

1"=0.5'



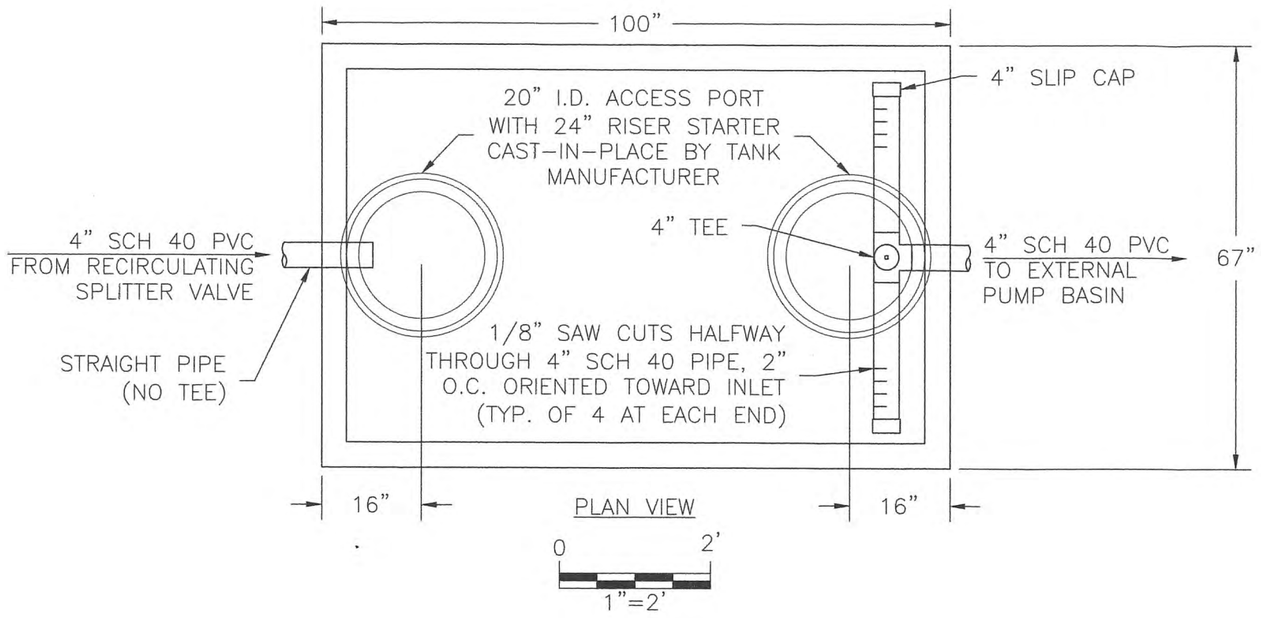
VIEW B–B'

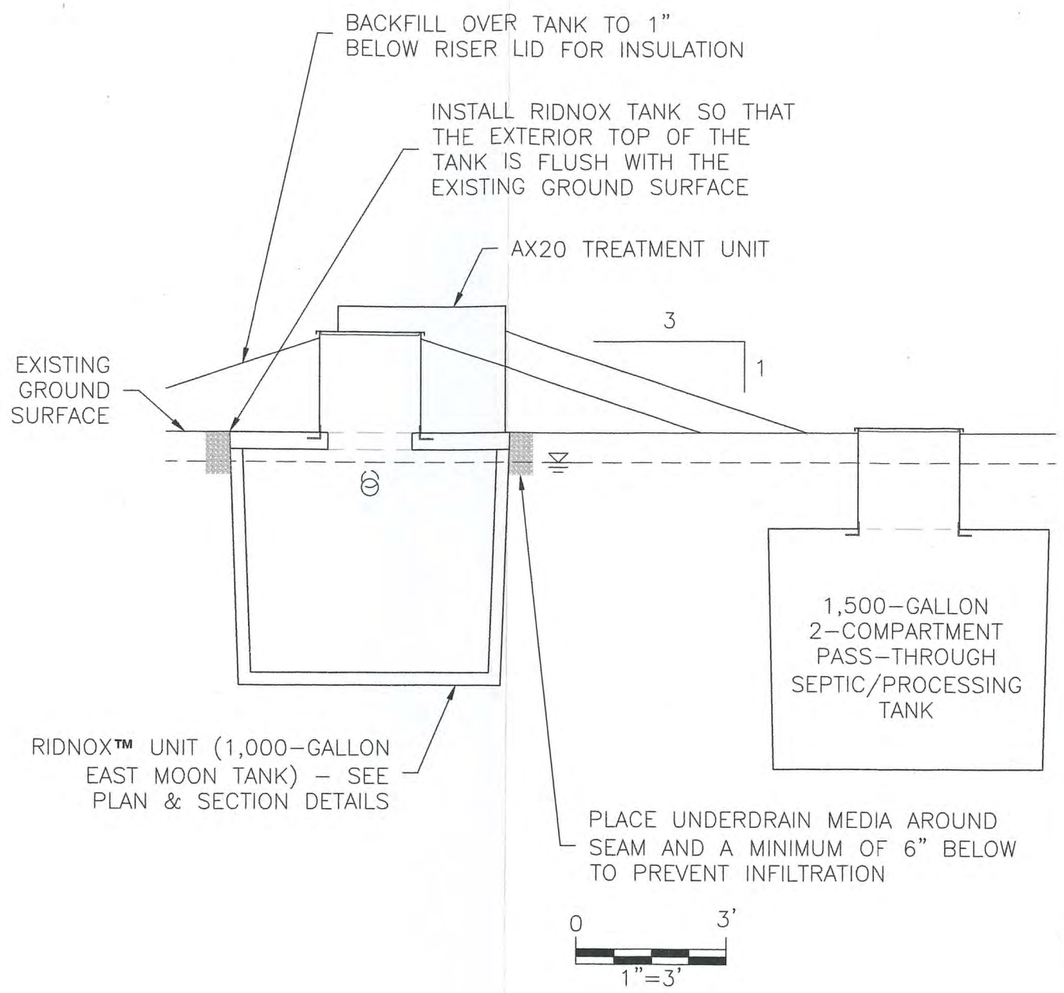
0 0.5'

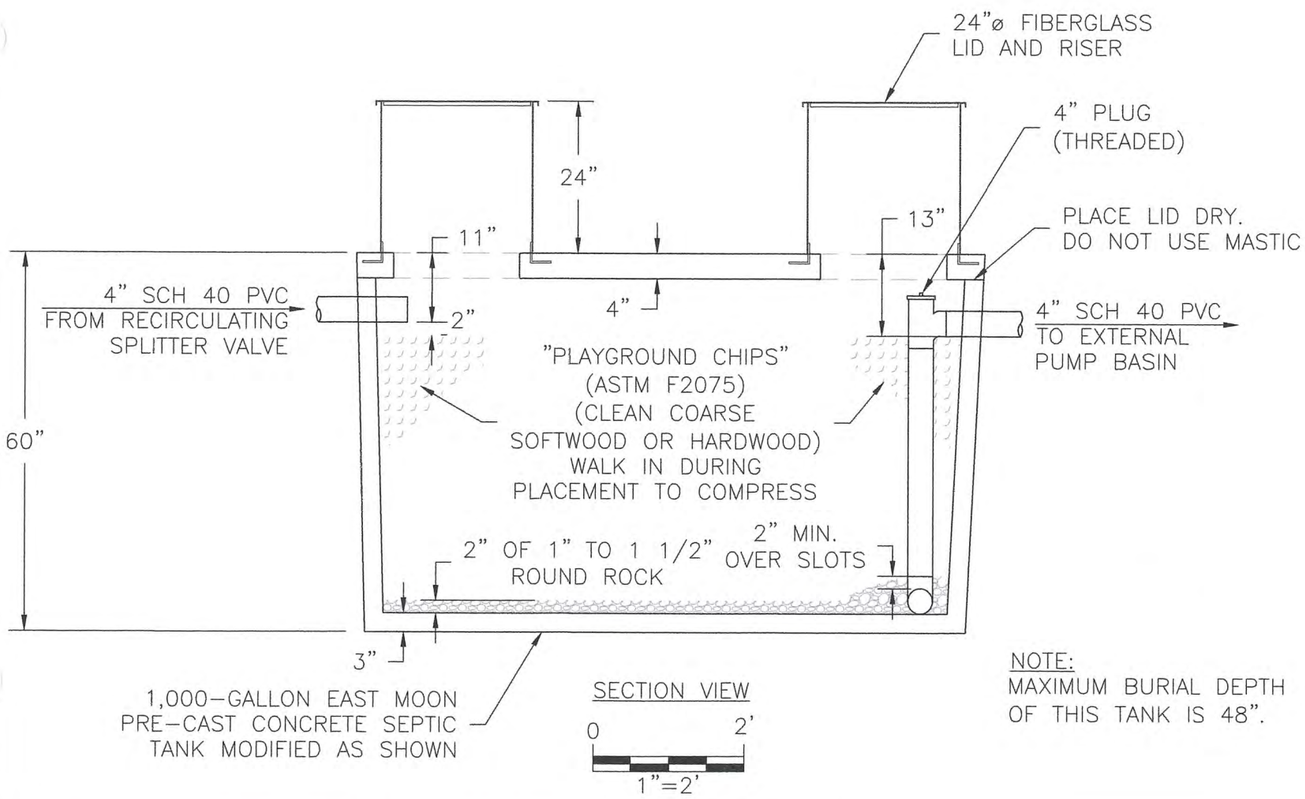
1"=0.5'

Figure 5. Lysimeter Details

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
DATE: 1/6/2025	
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC







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

Figure 6. RidNOx™ Details

PROJECT NUMBER: 2024038	Formal Variance
DATE: 1/6/2025	T20S, R10E, Section 13A, Tax Lot 14500
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	17091 Merced Road
REVISED:	Bend, OR 97707
	ELKHORN CONSULTING LLC

APPENDICES

Appendix A.

Tax Lot Map

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

3/2/2020

N.E.1/4 SEC.13 T.20S. R.10E. W.M.
DESCHUTES COUNTY

1" = 200'

20 10 13A0

Cancelled Nos.
400
2000
4800
7100
8400
10300
10500
11200
12400
15400
20000
20400
23200
23400

20 10 13A0

Appendix B.

Deed

This Document Was Prepared by:
Gerald W. Mason Sr
as Trustee of the GMS Living Trust
P.O. Box 3425
Sunriver, OR. 97707

After Recording, Please Return to:
Robert W. & Dina M. Laskey
1022 Clark Street
North Bend, OR. 97459

Mail Tax Statements To:
Robert W. & Dina M. Laskey
1022 Clark Street
North Bend, OR. 97459

Deschutes County Official Records
Steve Dennison, County Clerk **2024-02698**

01508328202400026980020024

D-D Cnt=1 Pgs=2 Stn=6 **02/02/2024 11:41 AM**
$10.00 $11.00 $61.00 $10.00 $6.00 $98.00

Reserved for Recording Purposes Only

OREGON QUIT CLAIM DEED

Gerald W. Mason Sr, as Trustee of the GMS LIVING TRUST, dated March 13, 2012, Grantor, releases and quitclaims to Lyon Investments, LLC, an Oregon Limited Liability company, as to an undivided 50% interest; and Robert W. Laskey and Dina M. Laskey, as tenants of the entirety, as to an undivided 50% interest, Grantee(s), the following described land, situated in Deschutes County, Oregon, described as follows:

LOT TWO (2), BLOCK FOURTY FIVE (45), OF DESCHUTES RIVER RECREATIONAL HOMESITES, UNIT 9, PART 2.

Also known as: 17091 Merced Rd; Sunriver, OR. 97707

The true consideration for this conveyance is **One Dollar ($1.00).**

"BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300 (Definitions for ORS 195.300 to 195.336), 195.301 (Legislative findings) AND 195.305 (Compensation for restriction of use of real property due to land use regulation) TO 195.336 (Compensation and Conservation Fund) 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 (Definitions for ORS 92.010 to 92.192) OR 215.010 (Definitions), 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 (Definitions for ORS 30.930 to 30.947), AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300 (Definitions for ORS 195.300 to 195.336), 195.301 (Legislative findings) AND 195.305 (Compensation for restriction of use of real property due to land use regulation) TO 195.336 (Compensation and Conservation Fund) 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."

Gerald W. Mason Sr.

Grantor

Gerald W. Mason Sr, as Trustee of the GMS Living Trust

Printed Name

17099 Merced Rd.; Sunriver, OR. 97707

Address (City, State, and ZIP)

541-480-6830

Phone Number

STATE OF OREGON)
) ss.
COUNTY OF DESCHUTES)

The foregoing instrument was acknowledged before me on the 01 day of February, 2024.

[NOTARY SEAL]

Notary Public for Oregon

My commission expires: May 04, 2024

OFFICIAL STAMP
AMANDA M. ADAME
NOTARY PUBLIC - OREGON
COMMISSION NO. 998901
MY COMMISSION EXPIRES MAY 04, 2024

Appendix C.

Site Evaluation Reports

DESCHUTES COUNTY

COMMUNITY DEVELOPMENT

September 19, 2024

LASKEY, ROBERT W & DINA M ET AL
1022 CLARK ST
NORTH BEND, OR 97459

RE: 247-24-000739-EVAL
17091 Merced Rd, Bend, OR 97707 - 201013A014500

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 **September 17, 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 **17** inches of the ground surface. 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 the permanent water table (OAR 340-071-0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302).
- This property is located in management area 7 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)
- In March of 2000, the site was monitored to determine the highest level the water table would reach on the property. An auger hole in the SE corner (highest part of the lot and area of current pit 3) and test hole 1 were primarily monitored. On March 17, 2000, the water table in both locations was observed at 16 inches below the ground surface. (See 247-FS18490)

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.

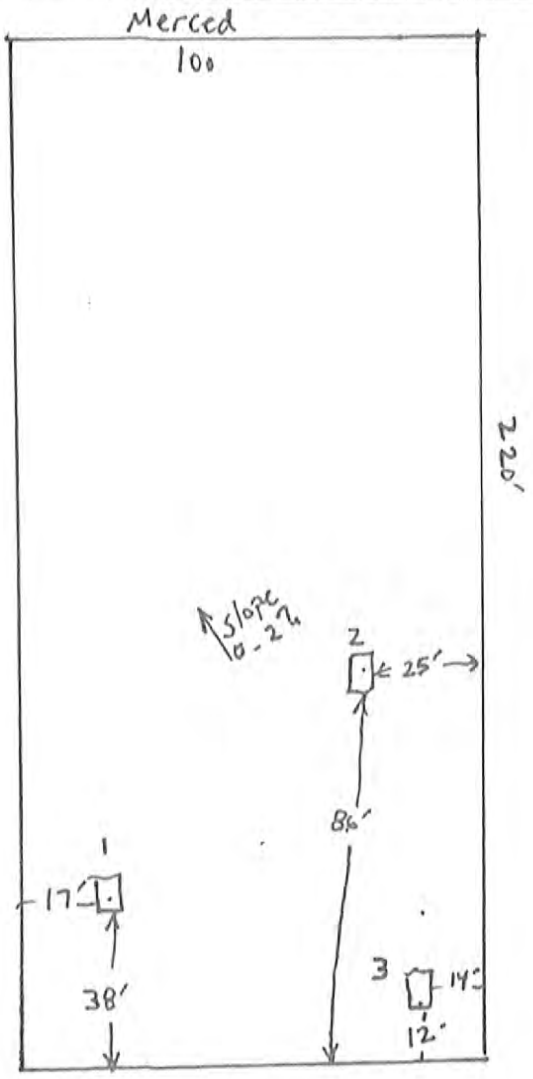
Sincerely,
Onsite Wastewater Division

Todd Cleveland

Todd Cleveland, REHS
Onsite Wastewater Manager

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Laskey Site Evaluation # 247-24-000739-EVAL
Date: 9/17/24 Subdivision: DRRH L 2 B 45 Parcel Size: 0.5
Evaluator: Todd Cleveland T 20 R 10 S 13A TL 14500
Suitable **Sketch/Not to Scale** **Unsuitable**



* Test hole locations provided by applicant

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

System type approved: Denied Absorption facility: _____
Initial _____ Min. Size _____ Max. Depth _____ Min. Depth _____
Replacement _____ Min. Size _____ Max. Depth _____ Min. Depth _____
Tank Size _____ Sewage Flow _____
Special Conditions: Denied due to conditions associated with saturation within 24 inches of the ground surface (see letter).

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Laskey Site Evaluation # 247-24-000739-EVAL

Evaluator: Todd Cleveland Date: 9/17/24 Parcel Size: 0.5

Subdivision: DRRH T 20 R 10 S 13A TL 14500 L 2 B 45

	DEPTH	TEXTURE	COLOR	Notes on roots, structure, % loose rock, mottling, layer limiting effective soil depth, etc.
1	0 – 7	coSL	10 YR 3/2	2fmc, 1msbk; vfriable
	7 – 22	LcoS	10 YR 3/3	2fm; sg; loose; @19"+ stripping & staining; @17" faint, irreg. stripping
	22 - 56	grSL	10 YR 3/2	0 roots; 2csbk; c2d Fe conc. & areas of stripping
2	0 – 6	coSL	10 YR 3/2	Similar
	6 – 23	LcoS	10 YR 3/3	2fm; 1msbk >sg; loose; stripping @ 17"-18"+
	23 – 41	coSL	10 YR 3/2	V1f; 1csbk; common stripping & staining
	41 – 53	S	10 YR 3/1	0 roots; 1csbks; c2d Fe conc.
3	0 – 6	coSL	10 YR 3/2	Similar
	6 – 23	LcoS	10.YR 3/3	2m; sg; @21"+ stripping;
	23 – 36	coSL	10 YR 3/2	0 roots; 1csbk; c2d Fe conc.
	36 - 53	S	10 YR 3/1	0 roots; similar – c2d Fe Conc.
4				
				*water table has been observed at 16" below the ground surface on March 17, 2000 on the highest elevation area of the property (near pit 3).
5				
6				

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

Slope: 0 – 2 % Aspect: NW Groundwater: Perm 17"

Other site notes: Willows across the street at edge of the road

Comments: In March of 2000, the site was monitored to determine the highest level the water table would reach on the property. An auger hole in the SE corner (highest part of the lot) and test hole 1 were primarily monitored. On March 17, 2000, the water table in both locations was at 16 inches below the ground surface. (See 247-FS18490)

Reason for Unsuitability: (Include Rule Reference)

OAR 340-071—0100, 0130, 0220, 0260, 0265, 0275, 0280, 0285, 0290, 0302).

CDD ARCHIVE COVER SHEET FOR LEL
08/07/2001 07:47:00 1 of 1

EH 001 ARCHIVE

FILE ID	201013A014500EH20010807999001
TAXMAP	201013A014500
SERIAL	116416
DIVISION	EH
SITUS	17091 MERCED RD
HOUSE#	17091
STREET	MERCED
CONTENT	ARCHIVE

DESCHUTES COUNTY

Community Development Department

117 NW Lafayette Avenue • Bend, Oregon • 97701-1925
(541) 388-6575
FAX 385-1764
Planning Division
Building Safety Division
Environmental Health Division

April 5, 2000

ROBERT E CLINK
1512 S NEARGLEN AVE
GLENDORA CA 91740

RE: F-18490 20-10-13A0-14500
17091 MERCED RD, BEND

The above lot was monitored for high ground water this Spring in the highest area of the lot. The ground water was above the 24 inch minimum separation mark for the entire month of March.

Therefore, this lot is denied for any on-site septic system. The options for site evaluation review and variance procedures as set forth in the initial letter are still in effect.

If you have any questions, please call this office.

Sincerely,

ENVIRONMENTAL HEALTH DIVISION

Roger W. Everett, Director

Dan Haldeman R.S.

Dan Haldeman, R.S.

Sanitarian

RWE/DWH/mas

PC David McElroy

DESCHUTES COUNTY

Community Development Department

117 NW Lafayette Avenue • Bend, Oregon • 97701-1925
(541) 388-6575
FAX 385-1764
Planning Division
Building Safety Division
Environmental Health Division

September 29, 1998

ROBERT E CLINK
1512 S NEARGLEN AVE
GLENDORA CA 91740

RE 18490 : 20-10-13A0-14500
17091 MERCED RD, BEND

Dear Mr. Clink:

You recently completed a site evaluation application for property at the above address.

Department of Environmental Quality rule 340-71-220-(2)(b) states water table levels shall be predicted using conditions associated with saturation. If conditions associated with saturation do not occur in soil with rapid or very rapid permeability, predictions of the highest level of the water shall be determined by past recorded observations of the agent. If such observations have not been made, or are inconclusive, the application shall be denied until observations shall be made. Groundwater level determinations shall be made during the period of the year in which high ground water normally occurs in that area.

Two of the three test pits have conditions associated with saturation within the minimum 24 inches required for approval of bottomless sandfilter system.

Therefore, this lot is denied until further observations can be made.

The normal highwater time of the year is April/May. If there is normal precipitation through the winter, this site will be reevaluated in the spring. No fee for next spring reinspection will be required.

If you choose not to wait until more conclusive evidence is available, the following options are still available.

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.

Sincerely

ENVIRONMENTAL HEALTH DIVISION
Roger W. Everett, Director

Dan Hademan R.S.

Dan Hademan, R.S.
Sanitarian

RWE:DWH:mas

David McElroy

SITE EVALUATION FIELD INSPECTION FORM

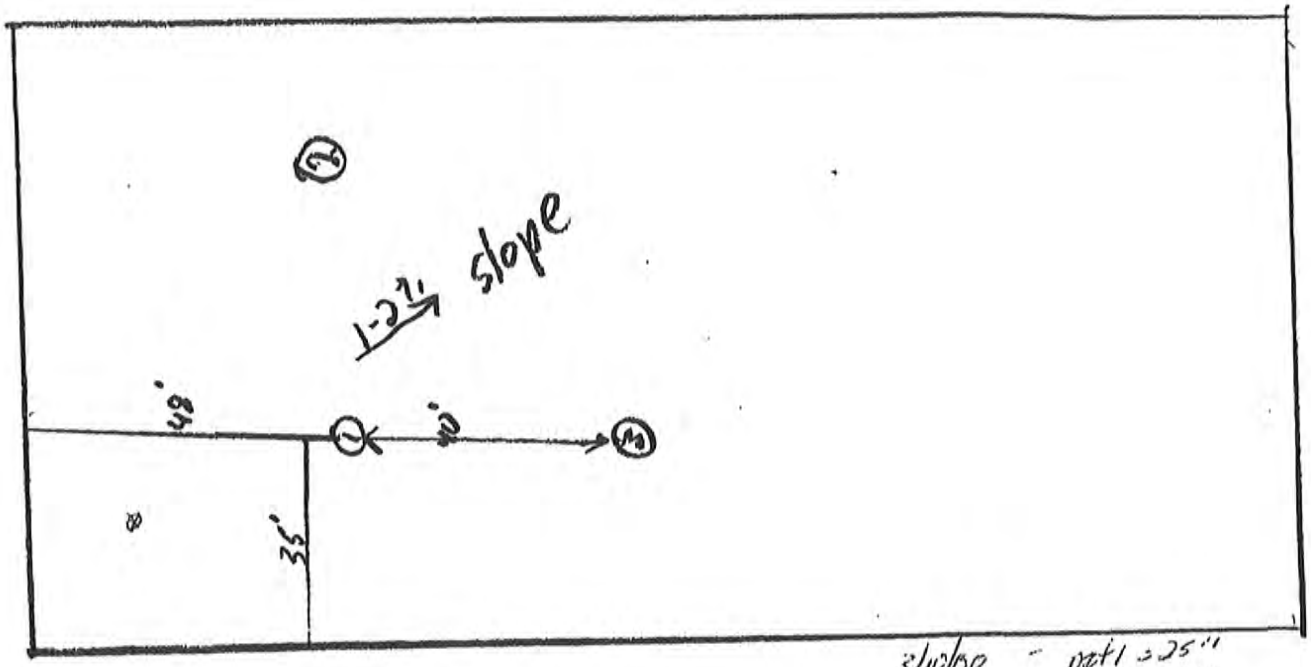
APPLICANT Clark, Robert E Etux SITE EVALUATION # 18490

DATE 9/24/98

SUBDIVISION _____ L _____ B _____ PARCEL SIZE .5

EVALUATOR: [redacted] Dan Haldeman T 20 R 10 S 13A TL 14500

SUITABLE ☐ SKETCH/NOT TO SCALE UNSUITABLE ☒



3/10/00 - pit1 = 25"
SE = 28"

3/17/00 SE 16", 16"

3/23/00 SE 23" ; pit1 = 20"

System type approved:
Initial _____
Replacement _____
Tank Size _____ gals

Absorption facility:
Min. Size ____ Max. Depth ____ min.
Min. Size ____ Max. Depth ____ min.
Sewage Flow 450 gpd.

Special Conditions: Need wet spring time observation to see if Southeast Corner could be approvable for bottomless sand FILTER

SITE EVALUATION FIELD INSPECTION FORM

APPLICANT _____ SITE EVALUATION # F18490

DATE 9/24/98

SUBDIVISION _____ L _____ B _____

EVALUATOR: ~~[illegible]~~ Dutt T 20 R 10 S 13A TL 14500

	Depth	Texture	Color	Notes on mottling, roots, structure, layer limiting effective soil depth, % loose rock etc. NLF = no limiting factors or no other limiting factors.
1	0-24	LOAMY SAND	10YR 5/3	Pumice
	24-36	SANDY LOAM	10YR 4/3/4/2	few faint oxy reductions, few fe. concretions
	36-43	SANDY LOAM	10YR 4/1	common distinct concretions
2	0-23	LOAMY SAND	10YR 4/3	Pumice
	23-33	SANDY LOAM	10YR 4/2	few faint f concr
	33-45	SANDY LOAM	10YR 4/1	c. & concr.
3	0-21		Similar to #2	
	21-30			
	30-40			
4				

Landscape notes TJB

Slope 1-2 % Aspect Down Groundwater permanent

Other site notes time - sweather conditions -

pits 2+3 have cond of sat above 24"

Comments: pit 1 has cond. sat starting at 24"

Reason For Unsuitability: (Include Rule Reference)

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

17091 Merced Road

November 26, 2024

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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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.

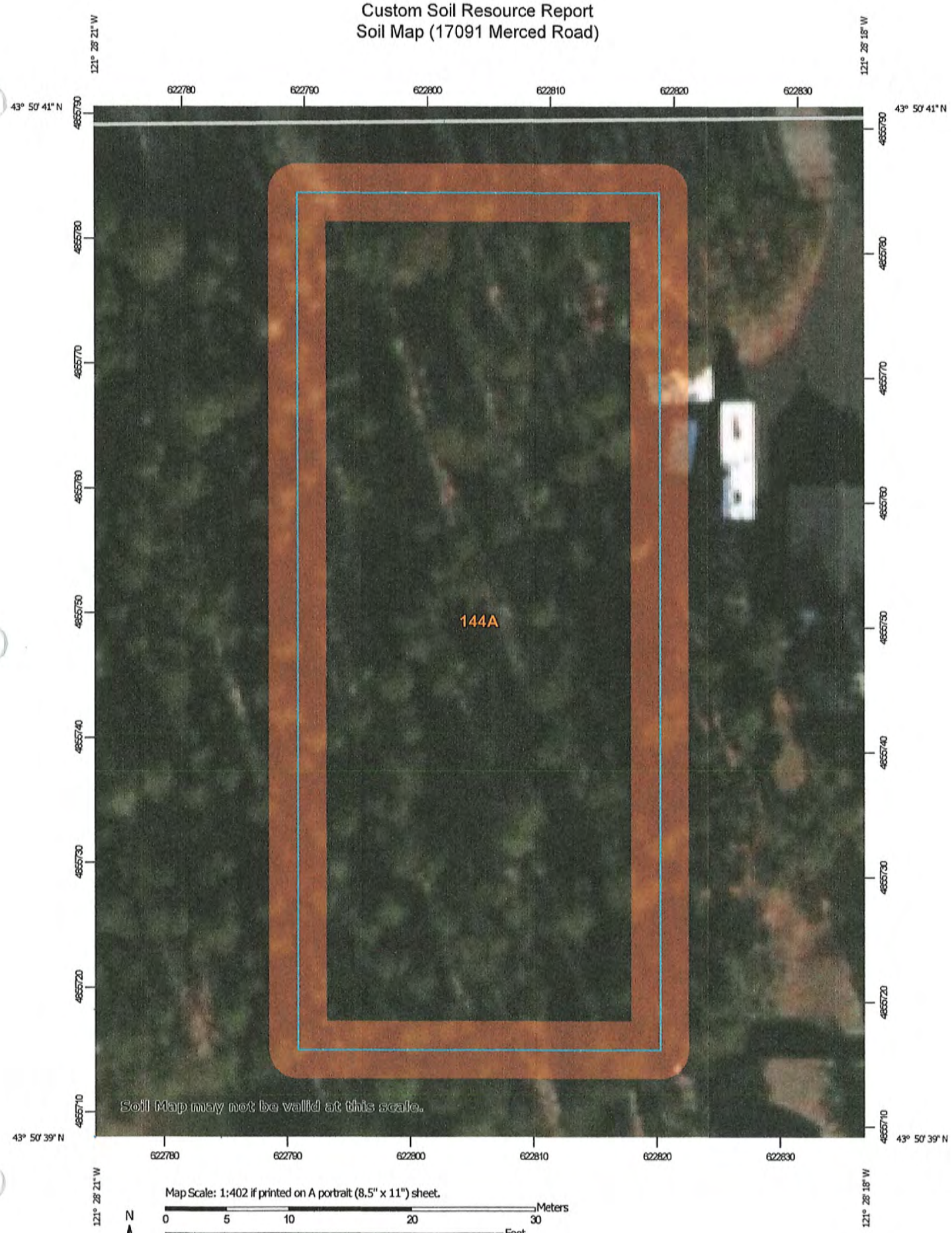
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 (17091 Merced Road)



Map Scale: 1:402 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 15 30 60 90

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 (17091 Merced Road)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
144A	Sunriver sandy loam, 0 to 3 percent slopes	0.5	100.0%
Totals for Area of Interest		**0.5**	**100.0%**

Map Unit Descriptions (17091 Merced Road)

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

144A—Sunriver sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 241l
Elevation: 4,000 to 4,300 feet
Mean annual precipitation: 18 to 25 inches
Mean annual air temperature: 40 to 44 degrees F
Frost-free period: 10 to 50 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sunriver and similar soils: 85 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunriver

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over old alluvium

Typical profile

H1 - 0 to 5 inches: sandy loam
H2 - 5 to 20 inches: loamy coarse sand
H3 - 20 to 29 inches: coarse sand
H4 - 29 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: B
Ecological site: F006XE807OR - Cryic Aquic Pumice Basins (PICO/SPDO-VAUL)
Other vegetative classification: Pinus contorta/Vaccinium uliginosum/forb (CLM311)
Hydric soil rating: No

Minor Components

Cryaquolls

Percent of map unit: 8 percent
Landform: Mountains
Ecological site: R006XB102OR - Cold Wet Meadow
Hydric soil rating: Yes

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United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix E.

Water Well Reports

Amended 1/4/2022

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

DESC 63874

12/13/2022

WELL I.D. LABEL# L 145614
START CARD # 1058753
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name JEFF&RACHEL Last Name LYON
Company
Address 93644 NORTHWAY
City NORTH BEND State OR Zip 97459

(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 [ ] 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 71.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	20	Bentonite Chips	0	20	13	S
6	20	71			Calculated	9.4	
					Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other BENTONITE CHIPS
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	X	1	71	.250	●	○	X	
○	●	4.5	X	1	71	sdr26	○	●	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

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)
15		26	2
15		26	2

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

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 14400
Tax Map Number Lot
Lat ° ' " or 43.84460000 DMS or DD
Long ° ' " or -121.47470000 DMS or DD
◉ Street address of well ○ Nearest address
17077 MERCED, BEND

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	10/4/2022			18

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 11'

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
10/4/22	11	13	15gpm			10'
10/4/22	65	71	15gpm			18

(11) WELL LOG
Ground Elevation

Material	From	To
pummie clay mix	0	3
brown sand clay mix	3	11
brown sand fine	11	13
clay gray	13	65
cinders	65	71
Helper: Zane Naylor		

Date Started 10/1/2022 Completed 10/4/2022

(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 10/28/2022
Signed SAM OLSON (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:

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

DESC 63874

12/13/2022

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

OREGON WATER RESOURCES DEPARTMENT

LOCATION OF WELL

Latitude: 43.84460000 Datum: WGS84
Longitude: -121.47470000
Township/Range/Section/Quarter-Quarter Section:
WM20.00S10.00E13SWNE
Address of Well:
17077 MERCED, BEND

Well Label: 145614

Printed: December 13, 2022

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

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

DESC 63880
12/13/2022

WELL I.D. LABEL# L 145613
START CARD # 1059176
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name CHRIS Last Name PALLE
Company
Address SEVEN SEAS MGMNT ORGANIZATION INC
City BEND State OR Zip 97702

(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 [ ] Cable [ ] Auger [X] 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 72.00 ft.

BORE HOLE

Dia	From	To
10	0	20
6	20	72

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
[X] Other BENTONITE CHIPS
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	X	1	69	.250	◉	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

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)
16	6	25	2

Temperature 42 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 78 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 2900
Tax Map Number Lot
Lat ° ' " or 43.84388000 DMS or DD
Long ° ' " or -121.47209000 DMS or DD
◉ Street address of well ○ Nearest address
17078 NORWALK

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	11/13/2022			19

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 11.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
11/13/2022	65	72	16			19

(11) WELL LOG
Ground Elevation

Material	From	To
pummy	0	3
brown sand clay mix	3	8
gravel sand mix	8	12
gray clay sand mix	12	15
clay gray	15	65
cinders black sand mix	65	72
Helper: Zane Naylor		

Date Started 11/6/2022 Completed 11/13/2022

(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 12/13/2022
Signed SAM OLSON (E-filed)
Contact Info (optional) 5415365339

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

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

DESC 63880

12/13/2022

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

OREGON WATER RESOURCES DEPARTMENT

LOCATION OF WELL
Latitude: 43.84388000 Datum: WGS84
Longitude: -121.47209000
Township/Range/Section/Quarter-Quarter Section:
WM20.00S10.00E13SWNE
Address of Well:
17078 NORWALK

Well Label: 145613

Printed: December 13, 2022

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

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

DESC 60471
12/10/2015

WELL I.D. LABEL# L 120253
START CARD # 1028338
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name MILTON Last Name STUBBS
Company
Address 4441 SE 31ST CT
City GRESHAM State OR Zip 97080

(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 [ ] 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 77.00 ft.

BORE HOLE

Dia	From	To
10	0	20
6	20	77

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	20	12	S
		Calculated	9.4	
		Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other 3 MINUTE POUR
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	X	1	70	.250	◉	○	X	
○	◉	4.5		70	77	SDR 26	○	◉	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

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

(7) PERFORATIONS/SCREENS
Perforations Method
Screens Type Saw Cut Material PVC

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Liner	4.5	70	77	.01	2	1950	4.5

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

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
15	12	28	2

Temperature 43 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 100 ppm

From	To	Description	Amount	Units
8	12	Total Disolved Solids	125	ppm
68	77	Total Disolved Solids	100	ppm

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 14300
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
◉ Street address of well ○ Nearest address
17071 MERCED RD, BEND

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	10/5/2015			16

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 8.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
10/5/2015	8	12	5			7
9/5/2015	68	77	15			17

(11) WELL LOG
Ground Elevation

Material	From	To
Pummie	0	2
Sand clay mix	2	8
Brown sand course	8	13
gray clay	13	68
Sand and gravel	68	77

Date Started 9/30/2015 Completed 10/5/2015

(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 12/10/2015
Signed SAM J 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:

RECEIVED

JUL 14 1995

WATER RESOURCES DEPT.
SALEM, OREGON

Desc 9998

20S/10E/13AC

(START CARD) # W76700

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

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

(1) OWNER: Well Number

Name Josh Krause

Address 17094 Norwalk

City Bend State Ore. Zip 97707

(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 54' ft.

Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
6"	0	54'	cement Grout			
				0	54'	1 Yd.

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

☐ Other

Backfill placed from None ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	0	54'		☐	☒	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

☒ Perforations Method Gun Perforator

☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
0	54'	.50	44	6"		☒	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.

Temperature of water 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

Depth of strata:

(9) LOCATION OF WELL by legal description:

County Deschutes Latitude Longitude

Township 20S N or S Range 10E E or W. WM.

Section 13 SW 1/4 NE 1/4

Tax Lot 12700 Lot 20 Block 45 Subdivision DRRH

Street Address of Well (or nearest address) 17094 Norwalk

(10) STATIC WATER LEVEL:

11 ft. below land surface. Date 7/8/95

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:

Ground Elevation

Material	From	To	SWL
6 sack cement grout	0	54'	

Date started 7/8/95 Completed 7/8/95

(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.

WWC Number 1645

Signed David B. Parks Date 7/10/95

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

DESC 9928

RECEIVED
JUN 15 1995
WATER RESOURCES DEPT
SALEM, OREGON

20S/10E/13ac

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

(START CARD) # W 76697

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

(1) OWNER: Well Number ____
Name JOSH KRAUSE
Address 17094 NORWALK
City BEND State ORE Zip 97707

(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 74 ft.
Explosives used ☐ Yes ☒ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	19'	Hol Mac	10	19	5
6"	19	74'	GRANULITE BENTONITE	0	10	6

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other POURED DRY
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	74	.25	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS: NONE
☐ Perforations Method ____
☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
10	8'		1 hr.
10	6'		24 HR

Temperature of water 47 F Depth Artesian Flow Found ____
Was a water analysis done? ☒ Yes By whom SEARS
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☒ Other TOO SHALLOW
Depth of strata: 9'-10'

(9) LOCATION OF WELL by legal description:
County DESCHUTES Latitude ____ Longitude ____
Township 20 S N or S Range 10 E E or W. WM.
Section 13 SW 1/4 NE 1/4
Tax Lot 12900 Lot 18 Block 45 Subdivision DRRH
Street Address of Well (or nearest address) 17078 NORWALK

(10) STATIC WATER LEVEL:
15 ft. below land surface. Date 6/10/95
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 9'

From	To	Estimated Flow Rate	SWL
9'	10'	10 GPM	3'
72'	74'	30 GPM	15'

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
PUMICE LOAM	0	1'	
PUMICE	2'	6'	
CLAY SAND GRAVEL	6'	9'	
SAND GRAVEL	9'	10'	3'
BROWN CLAY	10'	72'	
FINE GRAVEL & COARSE CINDERS	72'	74'	15'

Date started 6/7/95 Completed 6/10/95

(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.
WWC Number 1645
Signed David B Pinkley Date 6/11/95

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

DESC 9928

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301
(503) 986-0900
www.wrd.state.or.us

Application for Well ID Number

Do not complete if the well already has a Well I.D Number.

I. OWNER INFORMATION

Current Owner Name *(please print)*: DONNA ZUMWALT CREDIT SHELTER C/O GLENN KOTARA
Mailing Address: 56875 NEST PINE DR
City: BEND State: OR Zip: 97707
Mailing Address *(to send Well I.D.)*: 56875 NEST PINE DR
City: BEND State: OR Zip: 97707

II. WELL INFORMATION *(Do not complete this section if the well report is attached.)*

Township: 20S (North/South) Range: 10E (East/West) Section: 13
Tax Lot: 12900 County: DESCHUTES 1/4 1/4
Street Address of Well: 17078 MORNIALO City: BEND
Owner at time the well was constructed, (if known): KRAUSE
If the property had a different street address in the past:

III. GENERAL WELL INFORMATION *(Do not complete this section if the well report is attached)*

Use of Well (domestic, irrigation, commercial, industrial, monitoring): DOMESTIC
Date Well Constructed: Total Well Depth: Casing Diameter:
Other Information:

SUBMITTED BY *(please print)*: GLEN KOTARA
PHONE: 5414807752 FAX:

Send application to Oregon Water Resources Department; 725 Summer St NE, Suite A; Salem, Oregon 97301-1266; fax (503) 986-0902. Applications are processed and Well I.D. Numbers are mailed every Wednesday.

DESC 9928 100927

For Official Use Only by the Oregon Water Resources Department:
Received Date: Well Log Number: Well Identification #:

Last Update: 11/04/08

RECEIVED
AUG 07 2009
WATER RESOURCES DEPT
SALEM, OREGON

Well I.D. Number/ 1

RECEIVED
AUG 06 2009
WATER RESOURCES DEPT
SALEM, OREGON

WCC

RECEIVED

JUN - 3 1996

WATER RESOURCES DEPT.
SALEM, OREGON

Desc 50309

LO 3858

(START CARD) # W-83170

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

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

(1) OWNER: Well Number

Name Stephen Canfield
Address 15962 tallwood ct.
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 76 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	450 LBS
6	18	76				

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	76	250	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☑ Perforations Method torch cut
☐ Screens Type 250 Material steel

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
67	76	0/8	18	6		☑	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
18	4		4 Hr. 1/2

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:

LOCATION OF WELL by legal description:
County Deschutes Latitude Longitude
Township 20-S N or S Range 10-E E or W. WM.
Section 13aB NW 1/4 NE 1/4
Tax Lot 18700 Lot Block Subdivision
Street Address of Well (or nearest address) 17104 Mercad Rd Bend OR

(10) STATIC WATER LEVEL:
21 ft. below land surface. Date 5-30-96
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 65

From	To	Estimated Flow Rate	SWL
65	76	15+	21

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Pumice soil	0	3	21
Sand gravel clay	3	9	
gray clay	9	27	
Sticky clay	27	55	
gray clay	55	65	
Cinders sand	65	76	

Date started 5-30-96 Completed 5-30-96

(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.
WWC Number 1559
Signed Date 5-30-96

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

DESC 61753

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

WELL I.D. # L 62902

START CARD # 185025

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

(1) LAND OWNER
Name Rose Well Number Lowry
Address 2016 NW BROADWAY
City ALBANY State OR Zip 97321

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

(3) DRILL METHOD
☐ Rotary Air ☐ Rotary Mud ☒ Cable ☐ Auger ☐ Cable Mud
☐ Other

(4) PROPOSED USE
☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☐ No
Depth of Completed Well 80 ft.
Explosives used: ☐ Yes ☐ No Type Amount

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds
10	0	20	Bentonite	0	20	20
6	20	80				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other Pour
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	60	250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	4	20	60	160	☐	☒	☒	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS
☐ Perforations Method Factory
☒ Screens Type Material

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
60	80	020		4"		☐	☒
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
10	30		24 HR

Temperature of water 52° 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
Depth of strata:

(9) LOCATION OF WELL (legal description)
County Deschutes
Tax Lot Lot
Township 20S N or S Range 10E E or W WM
Section 13 NE 1/4 NW 1/4
Lat ° ' " or (degrees or decimal)
Long ° ' " or (degrees or decimal)
Street Address of Well (or nearest address) PT 17112
NORWALK RD BEND, OR 97703

(10) STATIC WATER LEVEL
20 ft. below land surface. Date 4-30-19
ft. below land surface. Date
Artesian pressure lb. per square inch Date

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

From	To	Estimated Flow Rate	SWL
20	80		

(12) WELL LOG Ground Elevation

Material	From	To	SWL
Pumice	0	10	
Gray CLAY	10	25	
Brown CLAY	25	50	
Gray CLAY	50	65	
Black SAND	65	75	
GRAVEL	75	80	

RECEIVED
SEP 30 2019
OWRD

Date Started 4-30-19 Completed 5-2-19

(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.

WWC 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.

WWC Number 1557 Date 9-15-19
Signed

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Desc 52623

SEP 22 1999

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form

WELL I.D. # L 34066
START CARD # 123925

(1) OWNER: Well Number
Name Doug & Charlotte NAVE
Address 66211 STELLAR DR.
City SUNRIVER State OREGON Zip 97707

(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 77 ft.
Explosives used ☐ Yes ☒ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	18	Bentonite Plug	0	18	9
6"	18	74				
4½"	74	77				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other POURED
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"	+21'	24'	1250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	SDR26				☐	☐	☐	☐
	4½ PVC	-7'	77'		☐	☒	glued	☐

Final location of shoe(s) NONE

(7) PERFORATIONS/SCREENS:
☒ Perforations Method SAWED
☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
72	77	.010	1935	4½"	SDR26	☐	☒
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
20	12'		2 1 hr.

Temperature of water 41°F Depth Artesian Flow Found ____
Was a water analysis done? ☐ Yes By whom NONE
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ____
Depth of strata: Did not drill thru.

(9) LOCATION OF WELL by legal description:
County Deschutes Latitude ____ Longitude ____
Township 22 N or ☒ S Range 10 ☒ E or W. WM.
Section 13A SW 1/4 NW 1/4
Tax Lot 12500 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) 17098 Abbott Rd.
BEND, ORE 97707

(10) STATIC WATER LEVEL:
9' ft. below land surface. Date 9-8-99
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 71 ft.

From	To	Estimated Flow Rate	SWL
71	77	20 gpm	9'

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
Dummy	0	6	
Cemented gravel	6	13	
Clay, Brown	13	71	
Solid gravel	71	77	9

Date started 9-18-99 Completed 9-19-99

(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.
WWC Number 639
Signed Gerald W. Olson Date 9-20-99

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

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 59892

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

State Well No. 20s/10E-13db
State Permit No. .....

(1) OWNER:
Name Ed Newingham Sr.
Address 60852 Granite Dr.
Bend Oregon 97701

(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 ☐
☐ Bored ☐

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

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
6" Diam. from +1 ft. to 77 ft. Gage .250
..." Diam. from ..... ft. to ..... ft. Gage .....
..." Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:
Perforated? ☑ Yes ☐ No.
Type of perforator used torch cut
Size of perforations 1/4 in. by 12 in.
12 perforations from 72 ft. to 77 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... 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?
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "
Bailer test 40 gal./min. with 7 ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m.
Temperature of water 41 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 6 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 SE ¼ Section 13 T. 20S R. 10E W.M.
Bearing and distance from section or subdivision corner
E SW Corner of Onward & Comet

(11) WATER LEVEL: Completed well.
Depth at which water was first found 72 ft.
Static level 13 ft. below land surface. Date June 16
Artesian pressure 0 lbs. per square inch. Date 0

(12) WELL LOG:
Diameter of well below casing 6
Depth drilled 77 ft. Depth of completed well 77 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
Sandy Loam	0	4	
Sandy loam & clay	4	6	
Sand & gravel	6	17	
Brown clay mud	17	31	
Gravel clay soft	31	37	
Black sand fine	37	39	
Gray gravel clay soft	39	72	
Black sand & gravel	72	77	13

RECEIVED
JUN 23 1980
WATER RESOURCES DEPT
SALEM, OREGON

Work started June 15 1980 Completed June 17 1980
Date well drilling machine moved off of well June 17 1980

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] ..... (Drilling Machine Operator) Date June 17, 1980
Drilling Machine Operator's License No. 1068

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 ..... (Person, firm or corporation) (Type or print)
Address 17355 Sparks River Rd
[Signed] ..... (Water Well Contractor)
Contractor's License No. 701 Date June 17, 1980

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-110

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 59847

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

State Well No. 20S/10E-13ad

State Permit No. .....

(1) OWNER:
Name Henry W. Kohb.
Address P.O. Box 96 Beaverton, Ore. 97004

(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 ☐
[illegible] ☑ Jetted ☐
[illegible] ☐ Bored ☐

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

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
6 " Diam. from +1 ft. to 80 ft. Gage .250
" Diam. from ..... ft. to ..... ft. Gage .....
" Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:
Perforated? ☑ Yes ☐ No
Type of perforator used Torch Cut
Size of perforations 1/8 in. by 12 in.
12 perforations from 75 ft. to 80 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... 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? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "
Bailer test 30 gal./min. with 11 ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m.
Temperature of water 43 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 7 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 Washington Driller's well number .....
SE ¼ NE ¼ Section 13 T. 2S R. 1E W.M.
Bearing and distance from section or subdivision corner
Norwalk & Lomst SE Corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 73 ft.
Static level 12 ft. below land surface. Date Sept 2
Artesian pressure ..... lbs. per square inch. Date .....

(12) WELL LOG:
Diameter of well below casing 6
Depth drilled 80 ft. Depth of completed well 80 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
Sandy Loam	0	9	
Sand & Gravel mud	9	11	
Brown Clay mud	11	37	
Sand & Gravel water	37	39	
Gray Clay sand	39	56	
Sand & Gravel gravel	56	57	
Gray Green clay	57	73	
Black sand & Gravel gravel	73	80	

RECEIVED
SEP 6 - 1979
WATER RESOURCES DEPT
SALEM, OREGON

Work started Aug 29 19 79 Completed Sept 2 19 79
Date well drilling machine moved off of well Sept 2 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] [illegible] Date Sept 2, 19 79
(Drilling Machine Operator)
Drilling Machine Operator's License No. 1168

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 [illegible]
(Person, firm or corporation) (Type or print)
Address 17219 SW Pleasant View Road
[Signed] [illegible]
(Water Well Contractor)
Contractor's License No. 701 Date Sept 2, 19 79

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

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

DESC 62242
9/24/2020

WELL I.D. LABEL# L 136824
START CARD # 1049110
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name JAROD Last Name DEBERNARDI
Company
Address 17056 NORWALK RD
City BEND State OR Zip 97707

(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 [ ] 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 86.00 ft.

BORE HOLE

Dia	From	To
10	0	18
6	18	86

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite	0	18	24	S
		Calculated	7.2	
		Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other POURED DRY
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	X	2	77	.250	●	○	X	
○	●	4		16	77	sch 40	○	●		X
○	○						○	○		
○	○						○	○		
○	○						○	○		

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

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type factory Material pvc

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Liner	4	77	86	.013	2	2000	

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

● Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
12	7	75	2

Temperature 49 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 38 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 13200
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
(●) Street address of well ( ) Nearest address
17056 NORWALK RD, BEND, OR 97707

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	9/24/2020			18

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 9.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
9/23/2020	9	13	5			9
9/24/2020	75	86	25			18

(11) WELL LOG

Ground Elevation

Material	From	To
Topsoil	0	1
Pummice	1	3
Brown clay with gravel	3	9
Course Gravel	9	13
Grey Clay	13	29
Grey Clay W/ Gravel	29	37
Green/Grey Clay	37	75
Course black sand with gravel	75	86

Date Started 9/23/2020 Completed 9/24/2020

(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 2035 Date 9/24/2020

Signed JOSHUA LISENBY (E-filed)

Contact Info (optional) Josh Lisenby 541-977-0031

ORIGINAL - WATER RESOURCES DEPARTMENT

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

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

DESC 64422
9/30/2023

WELL I.D. LABEL# L 152714
START CARD # 1071363
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name SCOTT Last Name BAKER
Company
Address 1730SE OAK SHORE CT.
City MILWAKIE State OR Zip 97267

(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 78.00 ft.

BORE HOLE

Dia	From	To
10	0	23
6	23	78

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	21	14	S
		Calculated	9.58	
		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 9/21/2023 Begin Time 09 00

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	6	X	1	77	.250	●	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

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)
25	8	35	2.5

Temperature 49 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 51 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 12300
Tax Map Number Lot
Lat ° ' " or 43.84343769 DMS or DD
Long ° ' " or -121.47302478 DMS or DD
◉ Street address of well ○ Nearest address
17069 NORWALK

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	9/25/2023			20

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 75.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
9/25/2023	75	78	35			20

(11) WELL LOG

Ground Elevation

Material	From	To
top soil	0	2
medium brown sand	2	8
grey clay	8	11
course gravel	11	14
grey clay	14	22
fine black sand	22	25
diatomite with sand layers	25	73
fine black sand	73	75
course pumice	75	78

Construction
Begin Date 9/20/2023 Begin Time 14 00 End Date 9/25/2023

(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 2074 Date 9/29/2023
Signed BRIAN STEWART (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 9/30/2023
Signed STEVE MATHERS (E-filed)
Contact Info (optional) 541-389-0743

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

WATER SUPPLY WELL REPORT - continuation page

DESC 64422

9/30/2023

WELL I.D. LABEL# L 152714
START CARD # 1071363
ORIGINAL LOG #

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To

SEAL Material	From	To	Amt	sacks/lbs
		Calculated		
		Calculated		
		Calculated		
		Calculated		

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

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

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Water Quality Concerns

From	To	Description	Amount	Units

(10) STATIC WATER LEVEL

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)

(11) WELL LOG

Material	From	To

Name of person(s) who assisted with construction and Trainee License # / Helper #

Assistant Name	Type	#
JAMES KING	WATER	2109

Comments/Remarks

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

DESC 64422

9/30/2023

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

OREGON WATER RESOURCES DEPARTMENT

LOCATION OF WELL

Latitude: 43.84343769 Datum: WGS84
Longitude: -121.47302478
Township/Range/Section/Quarter-Quarter Section:
WM20.00S10.00E13SWNE
Address of Well:
17069 NORWALK

Well Label: 152714

Printed: September 29, 2023

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

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

DESC 59571
9/18/2012

WELL I.D. LABEL# L 109781
START CARD # 1017667
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name GREG & TERESA Last Name BROXSON
Company TWIN PINES LANDSCAPE
Address PO BOX 4803
City SUNRIVER State OR Zip 97739

(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 [ ] 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 77.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	20	Bentonite Chips	0	20	15	S
6	20	77					

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other 3 MIN POUR
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	X	1	70	.250	●	○	X	
○	●	4.5		17	77	160	○	●	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

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

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type saw cut Material pvc

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Liner	4.5	70	77	.01	2	1950	4.5

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

(●) Pump ( ) Bailer ( ) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
21	4	16	2

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

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W
Sec 13 NW 1/4 of the NE 1/4 Tax Lot 14900
Tax Map Number 201013A14900 Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
(●) Street address of well ( ) Nearest address
17076 MERCED, SUNRIVER

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	9/13/2012			12

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 66.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
9/13/2012	3	12	5			3
9/13/2012	66	77	21			12

(11) WELL LOG

Ground Elevation

Material	From	To
Pummie	0	3
sand and gravel	3	12
Clay brown	12	50
Clay gray	50	66
Black sand and gravel course	66	77

Date Started 9/11/2012 Complete 9/13/2012

(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 construction standards. This report is true to the best of my knowledge and beli

License Number 1614 Date 9/18/2012

Signed SAM J 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:

WELL IDENTIFICATION FORM

Owner's Well Number: _____

CURRENT WELL OWNER: Phone 503/585-1465

Name: MARK + AMY HOOVER

Mailing Address: 335 FAWN AVE SE

City: SALEM State: OR Zip: 97302

RECEIVED
JUN 24 1999
WATER RESOURCES DEPT
SALEM, OREGON

WELL LOCATION: "DESC 52492"

County: DESCHUTES Latitude: _____ Longitude: _____

Township: 20 N or (S) Range: 10 (E) or W Section: 13 A 1/4 Ø 1/4

Tax Lot Number: 20900

Street Address of Well (if different from above): 17111 NORWALK RD
BEND, OR 97707

If a well report is available for this well, please attach a copy of it to this form and return. It is not necessary for you to complete the remainder of the form if the well report is attached. If a well report is not available, please complete the remainder of the form to the best of your ability.

WELL INFORMATION: NO WELL REPORT FILED

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:

Oregon Water Resources Department
158 12th Street NE
Salem, OR 97310

(Office use only)

Well Identification Number: 34998

DESC 56934

STATE OF OREGON

WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

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

WELL I.D. # L 78987
START CARD # 174759

(1) LAND OWNER Well Number
Name RUSSELL MAHANEY
Address P.O. BOX 3772
City SUNRIVER State OR Zip 97707

(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 77'-6" ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	18'	3/4" HOLE PLUG	0	18'	13
6"	18'	77'-6"				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other 3 MIN. POUR/BAG
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'-2"	72'	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	4½"	17'-6"	77'-6"	SDR 26	☐	☒	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☒ Screens Type SAWCUT Material PVC

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
72'-6"	77'-6"	.010	1950	2"	4½"	☐	☒
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
18	25'		1 hr.

Temperature of water 46° 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 NONE
Depth of strata:

(9) LOCATION OF WELL by legal description:
County DESCH. Latitude Longitude
Township 20 N or (S) Range 10 (E) or W. WM.
Section 13A SE 1/4 NE 1/4
Tax Lot 21000 Lot Block Subdivision
Street Address of Well (or nearest address) 17119 NORWALK RD

(10) STATIC WATER LEVEL:
14' ft. below land surface. Date 8-9-05
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 10'

From	To	Estimated Flow Rate	SWL
10'	12'	5+ GPM	9'
70'	77'-6"	18 GPM	14'

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
PUMMIE	0	3'	
BROWN SAND COARSE	3'	7'	
CLAY BROWN	7'	10'	
BROWN SAND FINE	10'	12'	9'
GRAY CLAY	12'	70'	
BLACK SAND COARSE	70'	77'6"	14'

RECEIVED
AUG 19 2005
WATER RESOURCES DEPT
SALEM, OREGON

Date started 8-9-05 Completed 8-9-05

(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.
WWC Number 1614
Signed Date 8-17-05

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONTRACTOR

DESC 58176

85949

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

WELL LABEL # L [redacted]

START CARD # 183444

(1) LAND OWNER Owner Well I.D.

First Name terry Last Name mcbeth
Company
Address po box 3711
City sunriver State or Zip 97707

(2) TYPE OF WORK [X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD [ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] 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 77 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
12	0	77	Bentonite Chips	0	18	20	S

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other poured
Backfill placed from 18 ft. to 72 ft. Material native
Filter pack from 72 ft. to 77 ft. Material gravel Size 10/20
Explosives used: [ ] Yes Type Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
◉	○	6	X	1	77	250	◉	○	X	

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

(7) PERFORATIONS/SCREENS

Perforations Method torch
Screens Type Material

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Casing		72	77	[redacted]	4	12	

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

◉ Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
20	10	20	1

Temperature 46 °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 S N/S Range 10 E E/W WM
Sec 13 SW 1/4 of the NE 1/4 Tax Lot 10900
Tax Map Number Lot
Lat ° 0 ' " or DMS or DD
Long ° 0 ' " or DMS or DD
◉ Street address of well ○ Nearest address
17080 oxnard

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening				
Completed Well	06-15-2006			10

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
06-15-2006	72	77	40			10

(11) WELL LOG Ground Elevation

Material	From	To
clay	0	6
gravel	6	15
pink ash	15	21
green diatamite	21	72
blk. sand	72	77

RECEIVED
AUG 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

Date Started 06-08-2006 Completed 06-15-2006

(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
Password : (if filing electronically)
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
Password : (if filing electronically) ******
Signed Glen Mathis
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: 0.88

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

DESC 62033

5/29/2020

WELL I.D. LABEL# L 136834
START CARD # 1047418
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name JEFF Last Name PERALA
Company
Address 14950 JULLIETT TERR
City TIGARD State OR Zip 97224

(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 [ ] 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 78.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	78	Bentonite Chips	0	18	14	S
					Calculated	10	
					Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other POURED
Backfill placed from 18 ft. to 73 ft. Material SAND AND BENTO
Filter pack from 73 ft. to 78 ft. Material FILTER SA Size 10/20
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	[X]	1	19	250	●	○		
○	●	4	[ ]	6	73	480	○	●	X	
○	○		[ ]				○	○		
○	○		[ ]				○	○		
○	○		[ ]				○	○		

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

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type slotted Material pvc

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen	Liner	4	73	78	.1		1750	

(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	30	55	1

Temperature 46 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 60 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W
Sec 13 NW 1/4 of the NE 1/4 Tax Lot 16500
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
(●) Street address of well ( ) Nearest address
17089 LAGUNA BEND

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration			[ ]	
Completed Well	5/27/2020		[ ]	17

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 73.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
5/27/2020	73	78	30		[ ]	17
					[ ]	
					[ ]	
					[ ]	
					[ ]	

(11) WELL LOG

Ground Elevation

Material	From	To
soil and pumice	0	3
brown clay	3	5
clay and gravel	5	11
pink ash	11	14
gray clay and green diatamite with silt	14	73
fine black sand	73	78

Date Started 5/25/2020 Completed 5/27/2020

(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 construction standards. This report is true to the best of my knowledge and belief.

License Number 1528 Date 5/29/2020

Signed STEVE MATHERS (E-filed)

Contact Info (optional) 541 389 0743

ORIGINAL - WATER RESOURCES DEPARTMENT

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

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

DESC 60515
3/7/2016

WELL I.D. LABEL# L 120624
START CARD # 1029855
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name BILL Last Name GAETANO
Company
Address P.O BOX 3920
City SUNRIVER State OR Zip 97707

(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 [X] Rotary Mud [ ] Cable [ ] 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 90.00 ft.

BORE HOLE

Dia	From	To
10	0	20
6	20	90

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	20	19	S
		Calculated	9.13	
		Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other POUR
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	X	1.5	90	250	◉	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

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/ Liner	Screen 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)
25	3	60	2

Temperature 49 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 190 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 20.00 S N/S Range 10.00 E E/W WM
Sec 13 SE 1/4 of the NE 1/4 Tax Lot 20300
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
◉ Street address of well ○ Nearest address
17132 NORWALK RD

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	3/4/2016			8

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 85.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
3/4/2016	85	90	50			8

(11) WELL LOG

Ground Elevation

Material	From	To
BROWN SANDY	0	8
GRAVEL	8	10
GRAY CLAY	10	55
GRAY/GREEN CLAY	55	85
GRAVEL	85	90

Date Started 3/4/2016 Completed 3/4/2016

(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 1966 Date 3/7/2016

Signed PAUL POCHATKO (E-filed)

Contact Info (optional) 541-536-4596

ORIGINAL - WATER RESOURCES DEPARTMENT

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

DESC 58470

DESC 58470

06-14-2008

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

WELL LABEL # L 92965

START CARD # 1003341

(1) LAND OWNER

Owner Well I.D.

First Name terry Last Name mcbeyh

Company

Address po box 3711

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 75.00 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
11	0	18	Bentonite Chips	0	18	17	S
6	18	75					

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	75	250	◉	○	☒	☐

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

Temp casing ☐ Yes Dia From To

(7) PERFORATIONS/SCREENS

Perforations Method torch

Screens Type Material

Perf/Screen	Casing/Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size
Perf	Casing		73	75	0	6	12	6

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

◉ Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
20	40	70	2

Temperature 48 °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 10.00 E E/W WM

Sec 13 NE 1/4 of the SW 1/4 Tax Lot 13300

Tax Map Number Lot

Lat ° 0 ' " or DMS or DD

Long ° 0 ' " or DMS or DD

◉ Street address of well ○ Nearest address

17048 NORWALK

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening				
Completed Well	04-30-2008			15

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 4

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
04-30-2008	10	15	10			4
04-30-2008	70	75	30			15

(11) WELL LOG

Ground Elevation

Material	From	To
soil and pumice	0	3
brown sand	3	12
green diatamite	12	70
coarse sand	70	75

RECEIVED
FEB 17 2009
WATER RESOURCES DEPT
SALEM, OREGON

Date Started 04-23-2008 Completed 04-30-2008

(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 06-14-2008

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 0.89

DESC 55040

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 60657
START CARD # 142824

(1) OWNER: Well Number
Name Gary Hutter
Address 56900 Spring River Rd.
City Bend State Ore Zip 97707

(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 80 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12"	0	20	Bent.	0	18	12
6"	20	80				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other Poured
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	79	250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☒ Perforations Method Torch
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
75	79	1/8	16			☒	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
15	3		1 hr.

Temperature of water 58° 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
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Desch. Latitude Longitude
Township 20 ☒ N or ☐ S Range 10 ☐ E or ☒ W. WM.
Section 12A SW 1/4 NE 1/4
Tax Lot 13900 Lot Block Subdivision
Street Address of Well (or nearest address) 17043 Merced

(10) STATIC WATER LEVEL:
12 ft. below land surface. Date 9-11-02
Artesian pressure lb. per square inch. Date

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

From	To	Estimated Flow Rate	SWL
56	58	40 GPM	12

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Soil + Pumice	0	2	
Clay + Gravel	2	12	
Grey Diatamite	12	60	
Blk. Sand	60	80	

RECEIVED
NOV 18 2002
WATER RESOURCES DEPT.
SALEM, OREGON

Date started 9-10-02 Completed 9-14-02

(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.
WWC Number 1528
Signed Steve Smalley Date 9-15-02

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

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

475 NE Bellevue Dr, Bend, OR 97701 to 17091 Merced Rd, Bend, OR 97707

You can enter notes here

475 NE Bellevue Dr
Bend, OR 97701

Take NE Dalton St to US-20

37 sec (463 ft)

1. Head north toward NE Dalton St

79 ft

2. Turn right toward NE Dalton St

149 ft

3. Turn right onto NE Dalton St

236 ft

Take US-97 S to S Century Dr/Lava Cast Forest Rd/NF-9720. Take exit 153 from US-97 S

22 min (17.3 mi)

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

2.3 mi

5. Continue straight onto NE Greenwood Ave

0.3 mi

6. Turn left onto NW Hill St

0.1 mi

7. Turn left onto NW Hawthorne Ave

413 ft

8. Turn right onto US-97 S

14.3 mi

9. Take exit 153 for S Century Dr toward Sunriver

0.2 mi

Follow S Century Dr, Spring River Rd and Solar Dr to Merced Rd in Three Rivers

9 min (4.9 mi)

10. Turn right onto S Century Dr/Lava Cast Forest Rd/NF-9720 (signs for Sunriver/Mt Bachelor)
    Continue to follow S Century Dr

1.5 mi

11. At the traffic circle, take the 2nd exit and stay on S Century Dr

0.6 mi

12. Continue onto Spring River Rd

1.2 mi

13. Turn left onto Solar Dr

1.3 mi

14. Turn right onto Merced Rd
    Destination will be on the left

0.2 mi

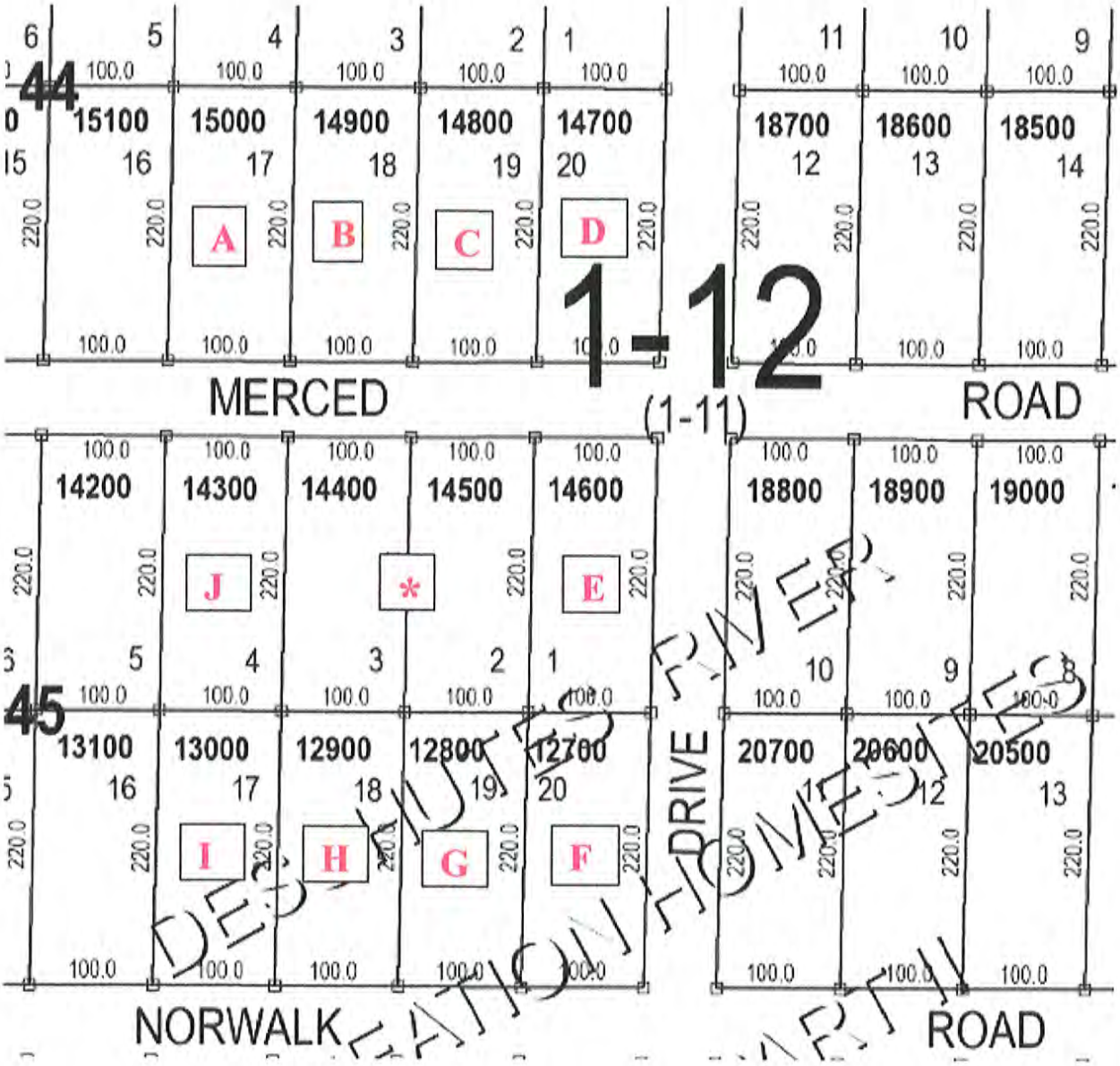
17091 Merced Rd
Bend, OR 97707

Adjacent Parcels Property Owners

17077 and 17091 Merced Road, Bend, Oregon
T20S, R10E, Section 13A, Tax Lots 14400 and 14500, 0.51 acres

*	Tax Lots	14400 and 14500	Laskey, Robert W. and Dina M. and Lyon Investments, LLC 1022 Clark Street North Bend, OR 97459
A.	Tax Lot	15000	Holland Revocable Trust PO Box 3033 Bend, OR 97707
B.	Tax Lot	14900	Broxson, Gregory D. and Tereasa L. PO Box 4803 Sunriver, OR 97707
C.	Tax Lot	14800	Snook, Ronald E. and Kerry E. 61248 Brookhollow Drive Bend, OR 97702
D.	Tax Lot	14700	Snook, Ronald E. and Kerry E. 61248 Brookhollow Drive Bend, OR 97702
E.	Tax Lot	14600	GMS Living Trust PO Box 3425 Sunriver, OR 97707
F.	Tax Lot	12700	Palle, Christopher and Andrea 61535 S highway 97 #5-633 Bend, OR 97702
G.	Tax Lot	12800	Palle, Christopher and Andrea 61535 S Highway 97 #5-633 Bend, OR 97702
H.	Tax Lot	12900	Seven Seas Mgmt Organization Inc. 61535 S Highway 97 #5-633 Bend, OR 97702
I.	Tax Lot	13000	Tranquil Point LLC 61535 S Highway 97 #5-633 Bend, OR 97702

J. Tax Lot 14300 Harbick, Scott
3208 NW 113th Circle
Vancouver, WA 98685



TAX LOT 1500D
DENIED (2005)

TAX LOT 14900
TDC LOT (2003)
NOT SEPTIC
ELIGIBLE

TAX LOT 14800
NO RECORDS

TAX LOT 14700
DENIED (2000)

17077 AND 17091 MERCED ROAD

TAX LOT 14300
DENIED (1978)

TAX LOT 14400

T20S, R10E,
SECTION 13A,
TAX LOT 14500

TAX LOT 14600
SAND FILTER
(2000)

Ⓦ

100'
SETBACK

50'
SETBACK

PROPOSED
HOUSE
(60'x60')

PROPOSED
GARAGE
(36'x40')

5' MIN.

RidNOx™
UNIT

TEST PIT 2
(2024)

PROPOSED 1,500
GAL. SEPTIC TANK

PROPOSED
EXTERNAL
PUMP BASIN

PROPOSED ADVANTEX
AX20N (MODE 3B)
TREATMENT SYSTEM

50' TANK
SETBACK

10'

PROPOSED 10'x25'
MODIFIED BOTTOMLESS
SAND FILTER

100' SAND
FILTER
SETBACK

PROPOSED 10'x25'
REPLACEMENT AREA

15'

15'

COMET DRIVE

TAX LOT 13000
DENIED (1994)

TAX LOT 12900
OLD STANDARD
SYSTEM UPGRADED
TO ATT + MBSF
– MAJOR
ALTERATION (2020)

TAX LOT 12800
APPROVED FOR
ATT + 250FT^2
BSF (2022)
PERMIT ISSUED
(2023) AND
EXTENDED (2024)

TEST PIT 3
(2024)

TAX LOT 12700
SAND FILTER
(1995)

N

0 40'

1"=40'

(SCALE AND LOCATIONS
ARE APPROXIMATE)

APPROVED

By DEQ Variance Officer 08/01/2025

David Hurley

Figure 2. Site Plan

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
DATE: 1/6/2025	
DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

C:\Users\dr702784\OneDrive – Valmont Industries\Desktop\Working Drafting DJR\2024038 Laskey\DWG\2024038 F1-6.dwg January 7, 2025 DR702784

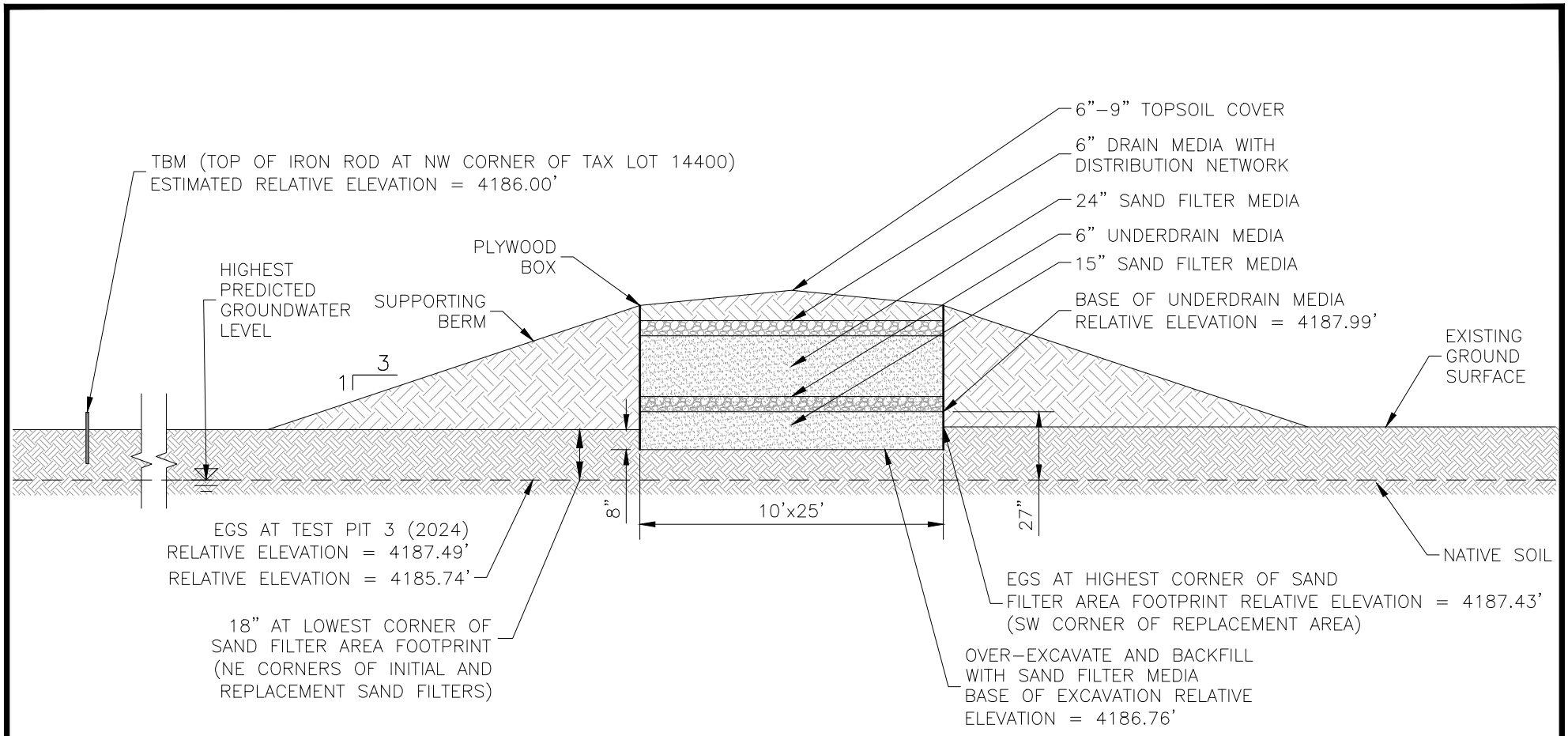


Figure 3. Modified Bottomless Sand Filter Section

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
DATE: 1/6/2025	
DWG NO: 2024038 F1–6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

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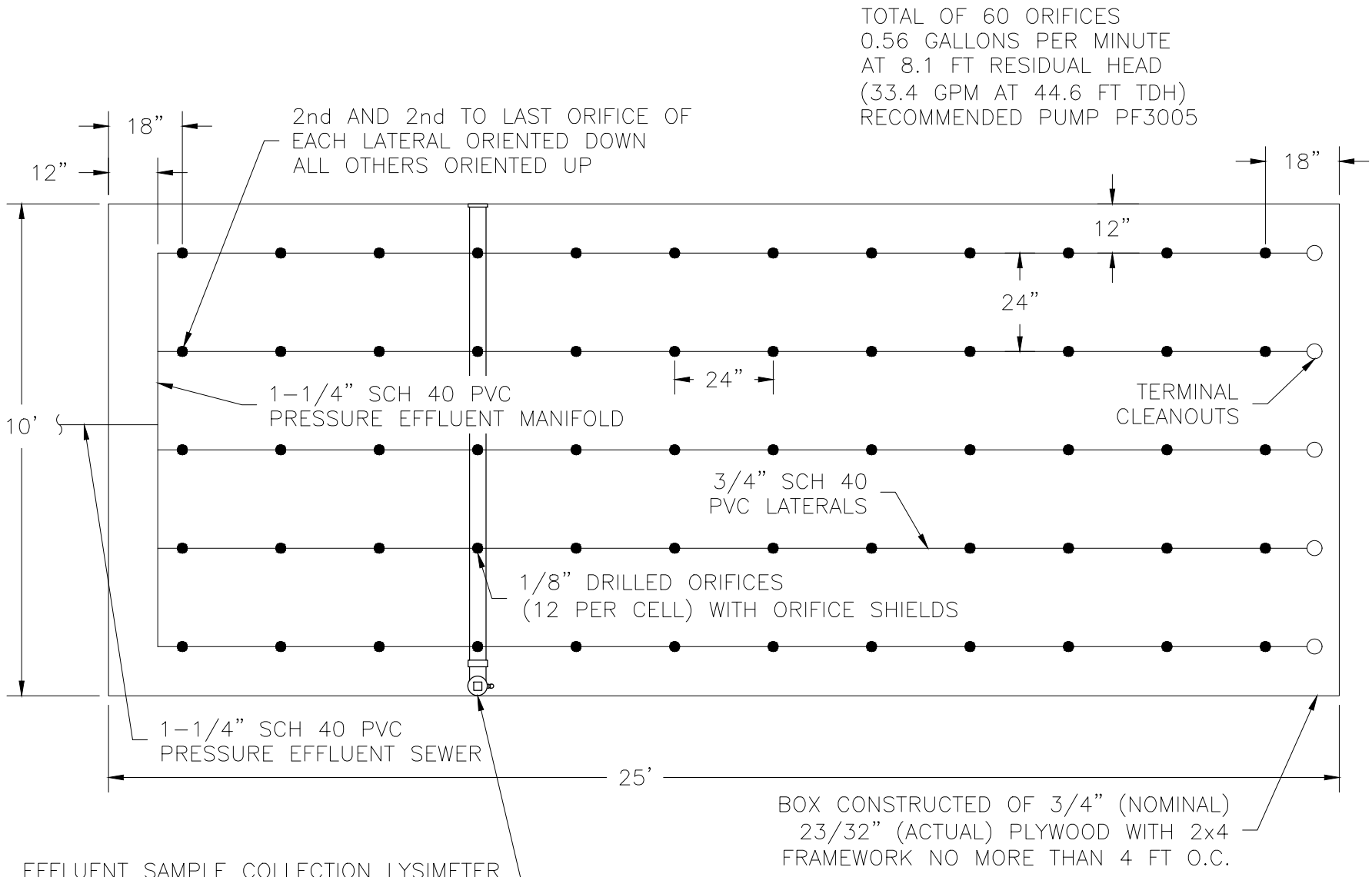

Figure 4. Sand Filter Plan Detail

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
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DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
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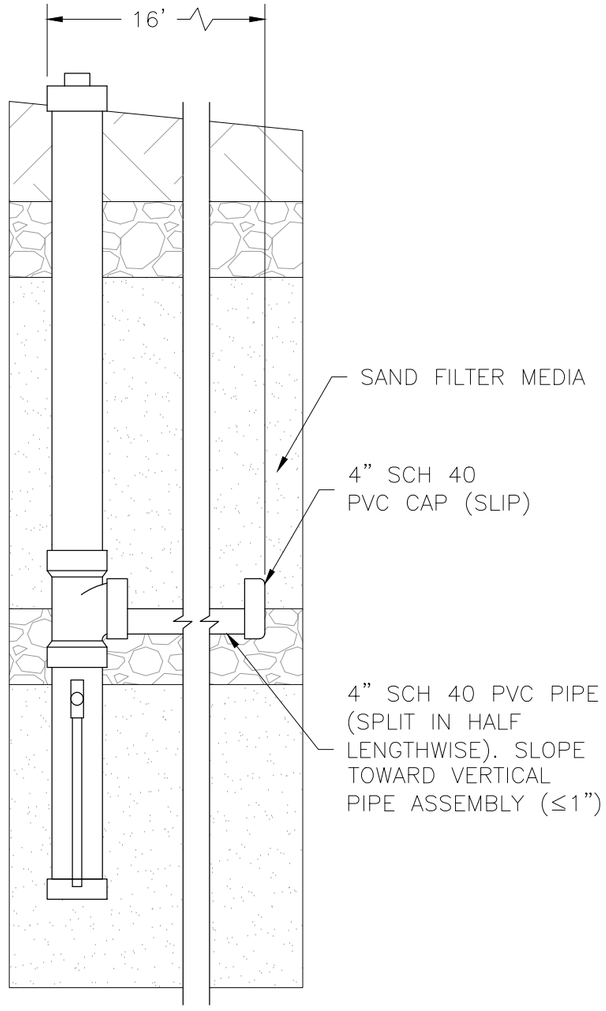
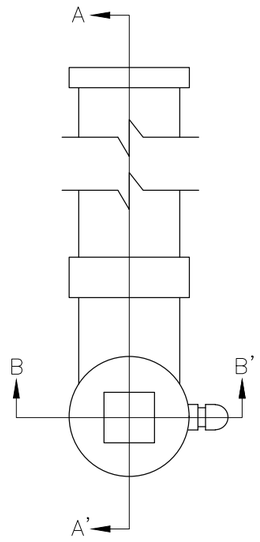


VIEW A–A'

0 1'

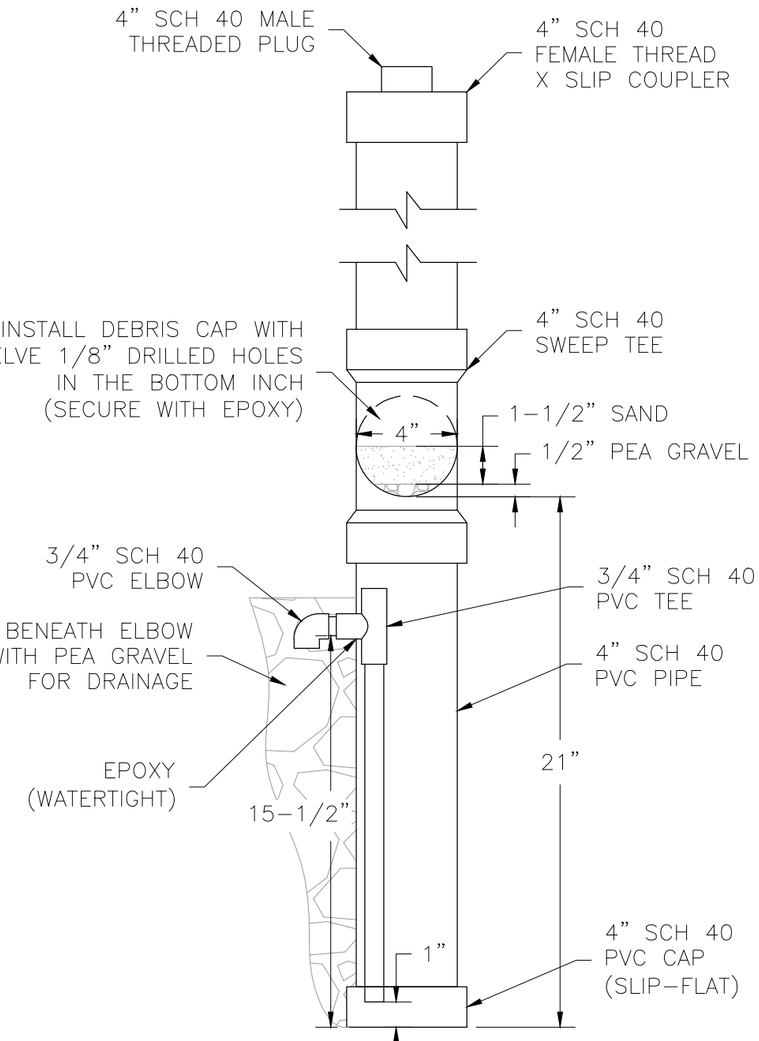
1"=1'



PLAN VIEW

0 0.5'

1"=0.5'



VIEW B–B'

0 0.5'

1"=0.5'

Figure 5. Lysimeter Details

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
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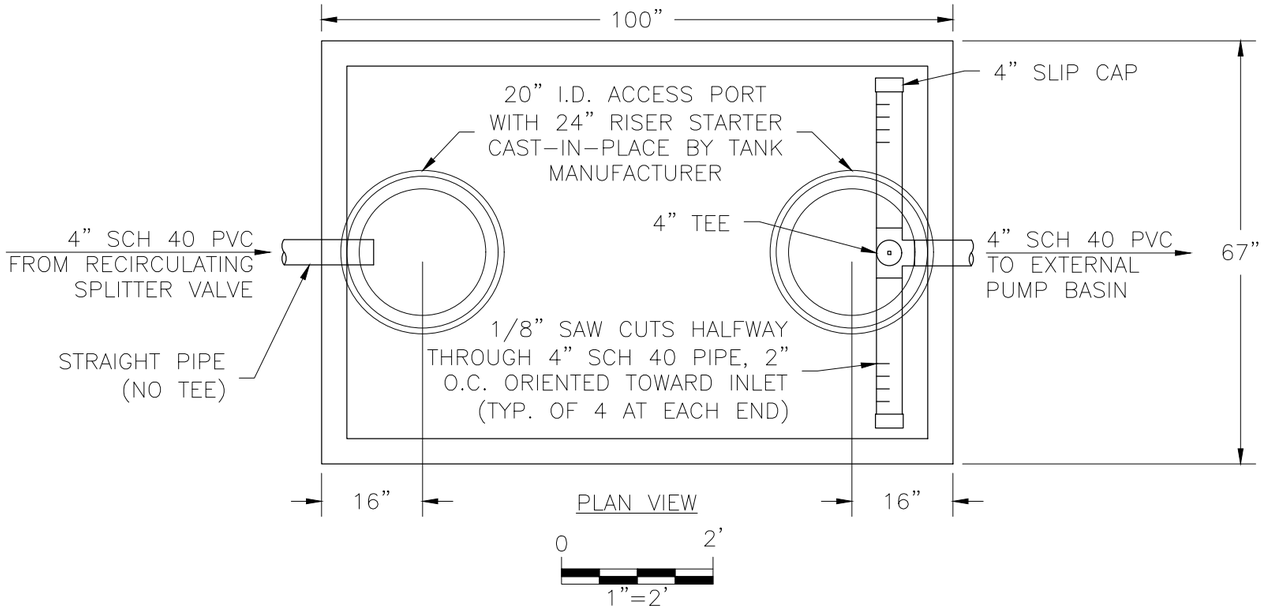
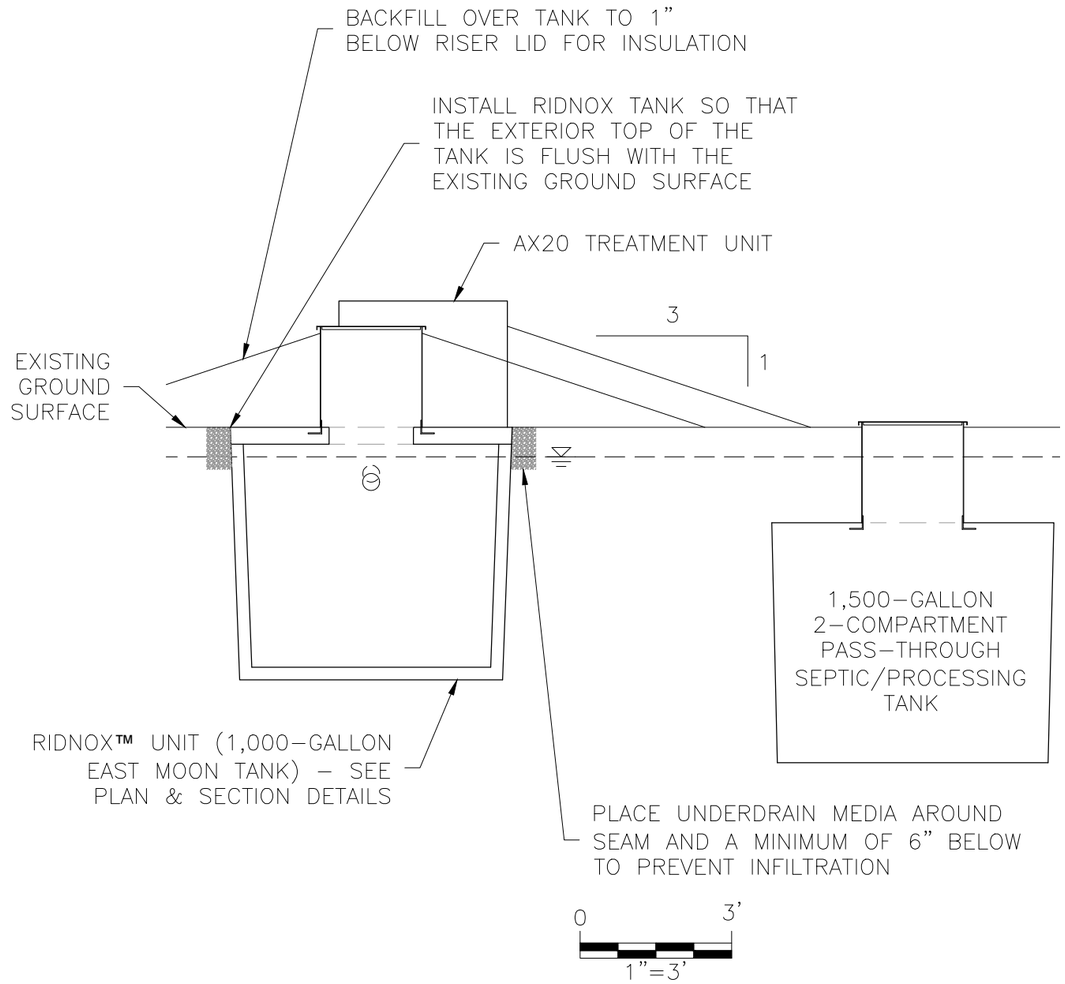
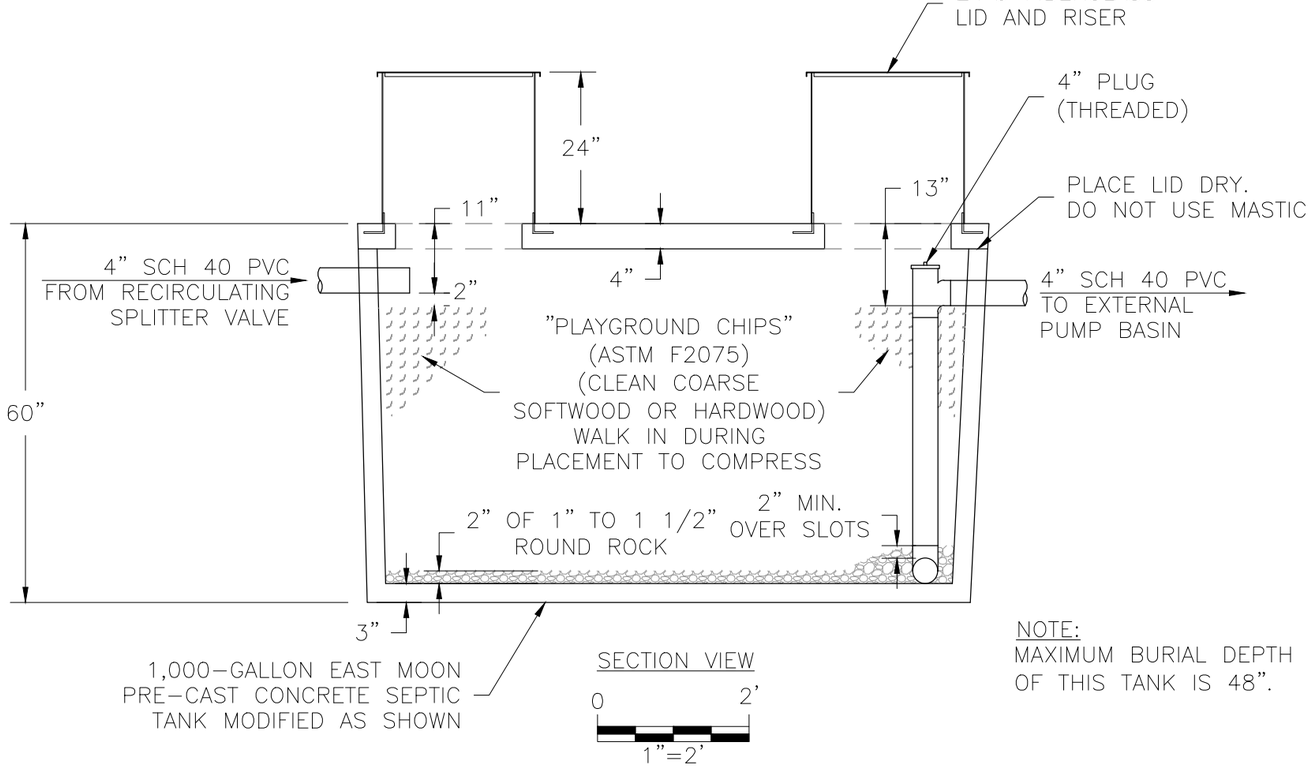
DWG BY: 6DJR PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC







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

Figure 6. RidNOx™ Details

PROJECT NUMBER: 2024038	Formal Variance T20S, R10E, Section 13A, Tax Lot 14500
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DWG NO: 2024038 F1-6.DWG	Robert & Dina Laskey and Lyon Investments LLC 17091 Merced Road Bend, OR 97707
DWG BY: 6DJR / PROJECT MANAGER: BRIAN RABE	
REVISED:	ELKHORN CONSULTING LLC

Variance Application from Oregon Administrative Rules Regulating Onsite Wastewater Treatment Systems

State of Oregon Department of Environmental Quality

Western and Northwest Regions:

Oregon Department of Environmental Quality
Onsite Program
165 East Seventh Ave, Ste 100
Eugene, Oregon 97401

Eastern Region:

Oregon Department of Environmental Quality
Onsite Program
475 NE Bellevue Dr, Ste 110
Bend, OR 97701

Please complete this application form and submit it with the fee and required attachments to one of the addresses above. The fees can be found in the current rule tables on DEQ's website here: https://ordeq.org/variancefees

Please note: Variance approval is not guaranteed, and fees are non-refundable. Learn more about the variance process at https://ordeq.org/septicvariance

Owner Information - Please Print:

Owner Name(s) (Last, First) Laskey, Robert W. & Dina M., Lyon Investments, LLC

Mailing Address 1022 Clark Street

City, State, Zip North Bend, OR 97459

Phone (541) 297-3182 Email rdlaskey@gmail.com

Property Information:

County Deschutes

Township, Range, Section, Tax Lot T20S R10E S13A Tax Lot 14500

Lot and Block Number Lot 2, Block 45 Subdivision Name Deschutes River Recreation Homesites Unit 9 Part 2

Provide the Following Attachments:

1. A locator map showing accurate directions to the property. List the property's street address if the street address is known.

2. **Two copies** of the parcel's legal description (metes and bounds, warranty deed, sales contract or approved subdivision plat). Include copies of the protective covenants, deed restrictions and easements applicable to the property.

3. **Two copies** of the assessor's tax lot map showing the property or a surveyor's plat map.

4. **Two copies** of a land use compatibility statement from the appropriate land use authority that your proposed land use is compatible with the Land Conservation and Development Commission's acknowledged comprehensive plan or statewide planning goals.

5. **One copy** of the DEQ (or county agent) site evaluation report, field notes, and other correspondence relating to past evaluations for septic system development.

6. **Two copies** of a narrative description for your variance proposal, including system construction specifications and the step-by-step procedures you propose to follow when installing the system. You must clearly describe how your proposal will overcome the limitations cited by DEQ or the county in the original denial.

7. **Two copies** of a plot plan drawn with the location and dimensions of all components of the proposed system. Use a defined scale that is not smaller than one-inch equals 30 feet. Also, be sure to include the replacement absorption facility in the plot plan drawing. Indicate separation distances between disposal trenches, springs, water courses, agricultural drainage tile, ditches, drainage ways, water lines, buildings, roads, embankments, and other identifying features, which help demonstrate parcel-to-drainfield relationships. Locate all wells within 200 feet of the proposed system and the replacement system.

8. The names and mailing addresses of all adjacent property owners and other known interested persons, for hearing notice.

9. The variance officer will request additional items be provided, if found necessary for the variance. The application will be deemed incomplete until the requested items are provided.

A minimum of two test pits must be provided within the specific area where the variance system is proposed, and should be approximately two feet wide, four feet long, and excavated to either bedrock or to a depth of five feet. Similar pits must be provided in the area of the repair system. The variance officer may require the proposed drainfield and the future replacement drainfield to be staked out.

Hardship Variances:

Hardship variances may be considered in cases of extreme and unusual hardship. The following factors may be considered: advanced age or bad health of applicant, need of applicant to care for aged, incapacitated or disabled relative, and the hardship variance will have relative, insignificant environmental impact. Documentation of hardship must be provided.

☐ MARK THIS BOX FOR HARDSHIP CONSIDERATION

By my (our) signature(s), I (we) request DEQ act on this application and hereby grant permission to enter onto the above-described property. I (we) also acknowledge that I (we) have read the Variance Process Fact Sheet found here: https://ordeq.org/septicvariance

12/3/2024 Dina Ousley
Date Owner Signature

12/3/2024
Date Owner Signature

NOTE: All owners must sign this application form. If there are more than two owners, have them sign additional duplicate applications and include them with submittal.

* Pursuant to ORS 454.662, the applicant is not required to submit the application fee if, at the time of filing the application, the applicant is 65 years of age or older, is a resident of the State of Oregon, and has an annual household income, as defined in ORS 310.630, of $15,000 or less. Appropriate documentation must be submitted with the application.

6. **Two copies** of a narrative description for your variance proposal, including system construction specifications and the step-by-step procedures you propose to follow when installing the system. You must clearly describe how your proposal will overcome the limitations cited by DEQ or the county in the original denial.

7. **Two copies** of a plot plan drawn with the location and dimensions of all components of the proposed system. Use a defined scale that is not smaller than one-inch equals 30 feet. Also, be sure to include the replacement absorption facility in the plot plan drawing. Indicate separation distances between disposal trenches, springs, water courses, agricultural drainage tile, ditches, drainage ways, water lines, buildings, roads, embankments, and other identifying features, which help demonstrate parcel-to-drainfield relationships. Locate all wells within 200 feet of the proposed system and the replacement system.

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12/23/2024 Lyon Investments, LLC

Date Owner Signature

Date Owner Signature

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