Oregon

Tina Kotek, Governor

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

August 4, 2025

Greg Sweet
710 NE Front Street
Prairie City, OR 97869

Re: WQ: Variance Approval: 248-25-000016-VAR: 4047 SW Wickiup Court; T.15S; R.13E; Sec. 19DC; Tax Lot 1100; 0.46 Acres; Deschutes County.

Dear Greg Sweet,

This correspondence verifies that a variance hearing provided for under Oregon Administrative Rules 340-071-0430, was held on the site at 11:15 am on June 3, 2025, for the subject property referenced above on Wickiup Court 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 is 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) that will discharge into a 250 square foot bottomless sand filter with an additional 8-inches or 14 – inches respectively of sand filter media (embedded 3-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). 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. 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 at regular intervals to ensure that the system is performing as expected. The monitoring and maintenance of the system shall be reported to Deschutes County on an annual basis.
- The depth of the local water and numerous basalts flows between the surface and the underlying water table support concluding that the risk to the underlying groundwater from this proposed system is low.

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 discharging through a bottomless sand filter, will have a significant reduction in BOD, TSS, TN, and Fecal Coliform. In this proposal, treated ATT effluent will be discharged into a 250 square foot bottomless sand filter with an additional 8-14- 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 31-35 - 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.

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 June 6, 2000, where a denial was issued for the use of an onsite wastewater system on June 6, 2000. The primary reason for denial was due to the lack of minimum required soil depth and the lack of sufficient useable area to construct an onsite system.

The proposed solution to overcome site limitations involves installing an Orenco® AdvanTex AX20N-Mode 3B Alternative Treatment Technology System, which will discharge to a 250 sq. ft. elevated Bottomless Sand Filter. This filter will be constructed on an 8- to 14-inch bed of sand media embedded 3

inches into the native soil. The proposal addresses the 2-foot continuous soil limitation by adding the 8 to 14 inches of additional sand media, thereby providing a total vertical separation of 31 to 35 inches from the bottom of the system to the shallowest depth of bedrock. 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)(a) which states that saprolite; fractured bedrock; gravel; or sand, loamy sand, or sandy loam occur in a continuous section at least two feet thick in contact with and below the bottom of the sand filter. **This rule is being overcome by elevating the bottomless sand filter to exceed the 2-foot-thick requirement**

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
Martin G & Laurie A Stunkel Rev Trust, 2920 SW Brentwood Dr, Redmond, OR 97756
Ronald A & Leslie Westendorf, 2866 SW Brentwood Dr, Redmond, OR 97756
Lujan Revocable Trust, 60528 Elkai Woods DR, Bend, OR 97702
Patrick D & Patricia J Schmitt, 4005 SW Wickiup Ct, Redmond, OR 97756
Dick & Nadines Trust, 80 South Place, Lebanon, OR 97355
Glen J & Linda Swearingen, 4022 SW Wickiup Ct, Redmond, OR 97756
Michael G Orwick, 1604 NW Lynch Ave, Terrebonne, OR 97760
Sager Family Trust Et Al, 405 SW Wickiup Ct, Redmond, OR 97756
Whitaker Family Trust, 2950 SW 41st St, Redmond, OR 97756

Schedule A – Sweet
Variance Report - Special Conditions
T 15S, R 13E, Sec: 19DC, TL 1100

Special Conditions and requirements for the Orenco® AX20N-Mode 3B Alternative Treatment Technology unit followed by an elevated 250 square foot Bottomless Sand Filter at 4047 Wickiup Court; T.15S; R.13E; Sec. 19DC; Tax Lot 1100; 0.46 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.

APPROVED

By DEQ Variance Officer 08/04/25

David Hurley

TAX LOT 700
STANDARD SYSTEM
(1979)

TAX LOT 800
SAND FILTER &
REDUNDANT DRAINFIELD

PROPOSED 10'X25'
MODIFIED BOTTOMLESS
SAND FILTER

PROPOSED AX20RT
TREATMENT UNIT

15'

TP1

TP2

PROPOSED 10'X25'
REPLACEMENT AREA

20'

10'

TAX LOT 900
STANDARD SYSTEM
(1990)

PROPOSED
1,000 GALLON
SEPTIC TANK

CLEANOUT

5' MIN.

TAX LOT 1200
CAPPING FILL
(1980)

PROPOSED
GARAGE
(25'x32')

10'

PROPOSED
HOUSE
(50'x50')

TBM – TOP OF IRON ROD

TAX LOT 1300
DENIED (1992)

TAX LOT 1000
SAND FILTER &
DRAINFIELD
(1997)

T15S, R13E, S19DC,
TL1100

4047 SW WICKIUP COURT

TAX LOT 1400
STANDARD SYSTEM
(1990)

Figure 2. Site Plan

TAX LOT 1600
CAPPING FILL
(1983)

TAX LOT 1500
DENIED (2018)

0 20'

1"=20'

(SCALE AND LOCATIONS
ARE APPROXIMATE)

PROJECT NUMBER: 2024039	Formal Variance T15S, R13E, Section 19DC, Tax Lot 1100
DATE: 12/6/2024	
DWG NO: 2024039 F1-4.DWG	Greg and Katie Sweet 4047 SW Wickiup Court Redmond, OR 97756
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	
REVISED:	ELKHORN CONSULTING LLC

C:\Users\dr702784\OneDrive – Valmont Industries\Desktop\Working Drafting DJR\2024039 Sweet Variance\DWG\2024039 F1-4.dwg December 6, 2024 DR702784

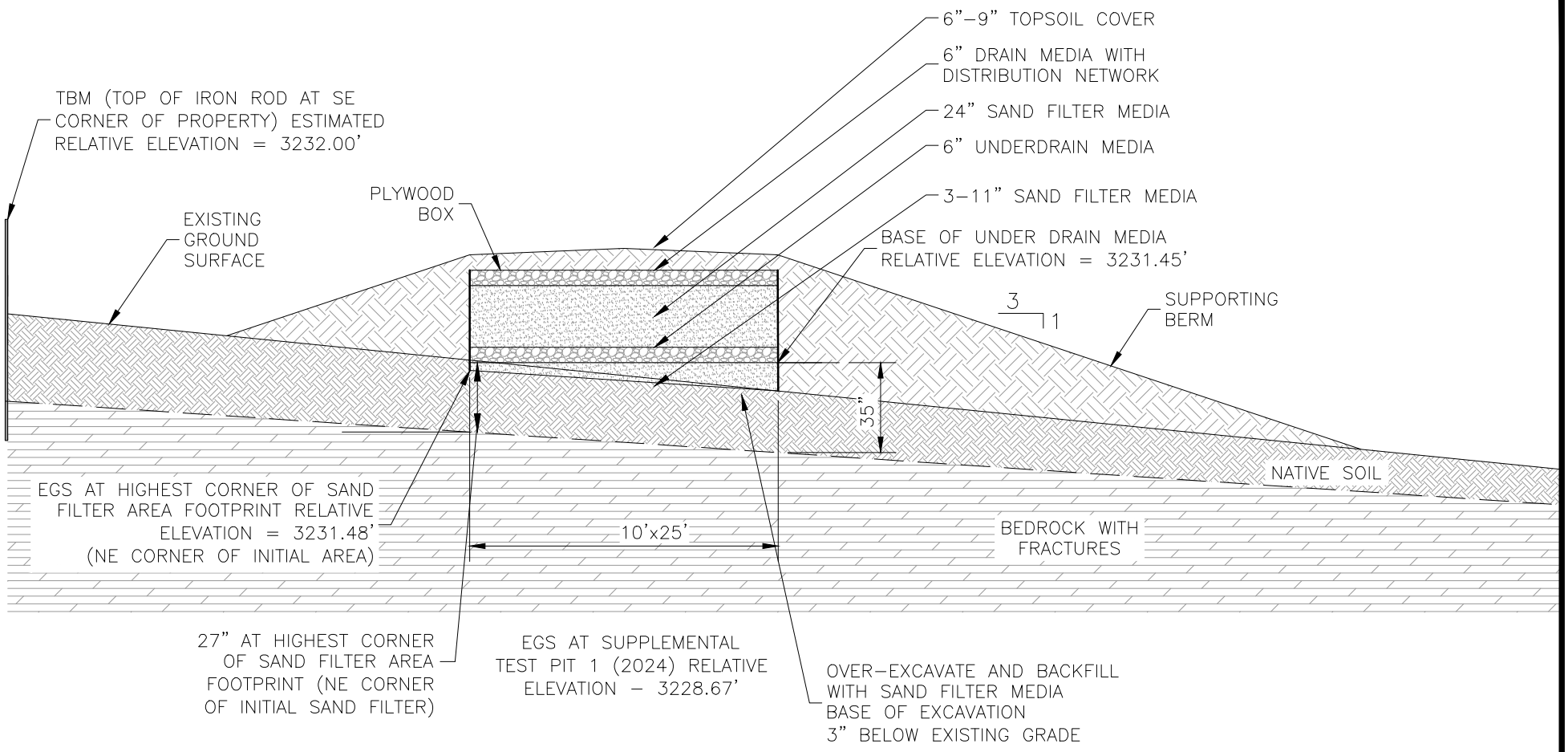


Figure 3A. Modified Bottomless Sand Filter Section – Initial

0 5'

1"=5'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG NO: 2024039 F1–4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

2024039 F1–4.dwg December 5, 2024 DR702784

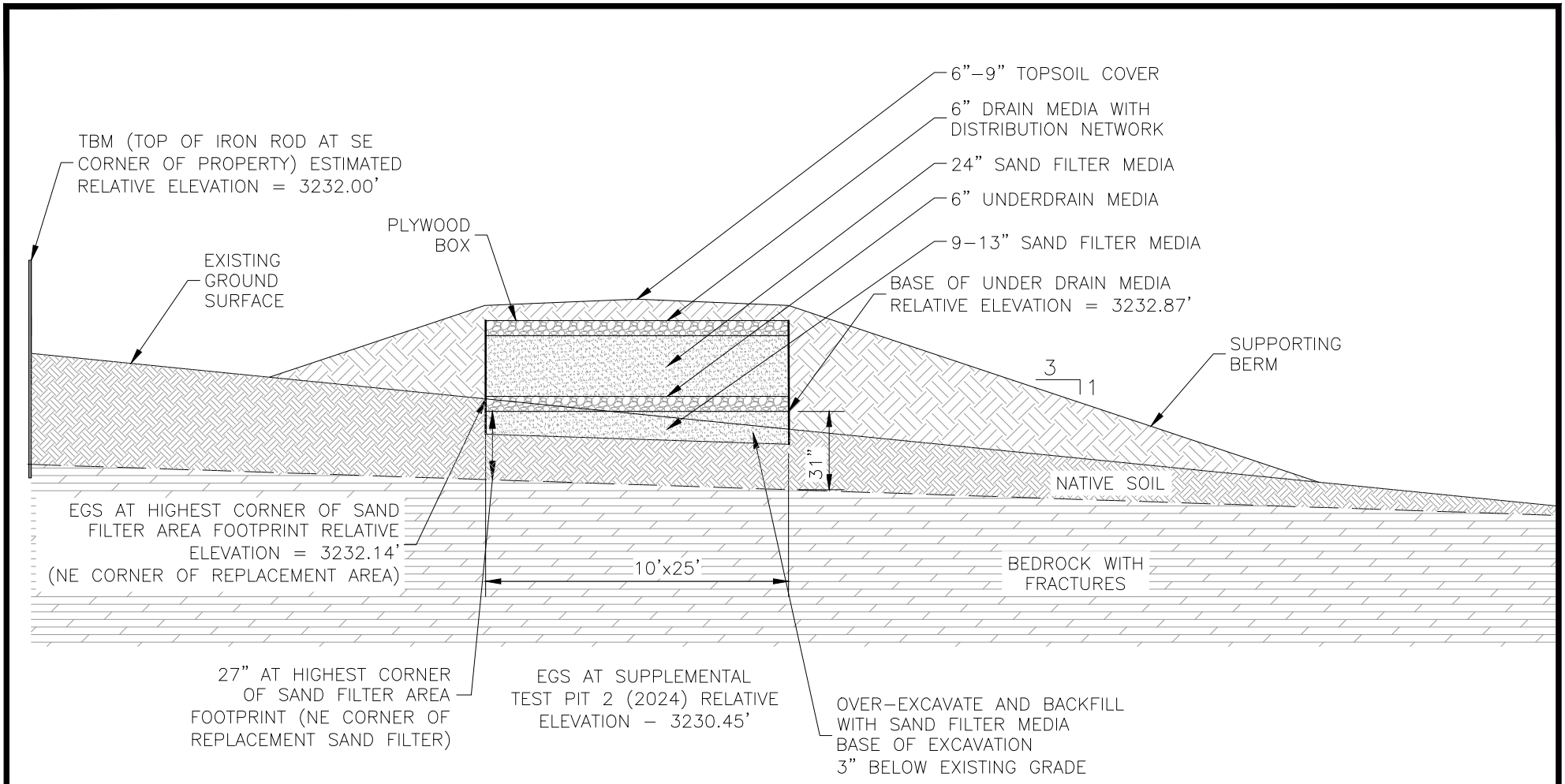


Figure 3B. Modified Bottomless Sand Filter Section – Replacement

0 5'

1"=5'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG NO: 2024039 F1–4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

2024039 F1–4.dwg December 5, 2024 DR702784

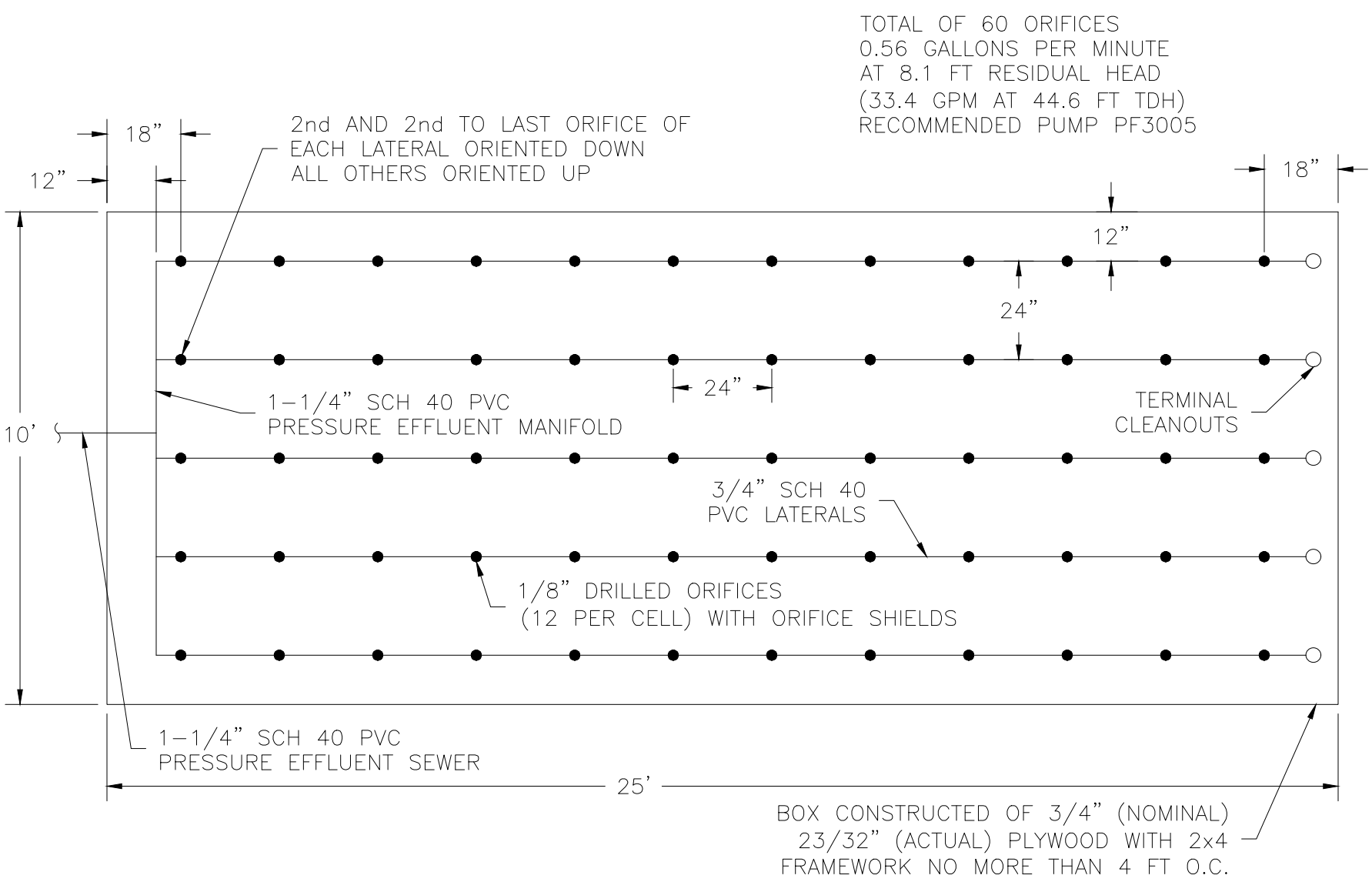


Figure 4. Sand Filter Plan Detail

0 4'

1"=4'

PROJECT NUMBER: 2024039	Formal Variance T15S, R13E, Section 19DC, Tax Lot 1100
DATE: 12/6/2024	
DWG NO: 2024039 F1-4.DWG	Greg and Katie Sweet 4047 SW Wickiup Court Redmond, OR 97756
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	
REVISED:	ELKHORN CONSULTING LLC

2024039 F1-4.dwg December 5, 2024 DR702784

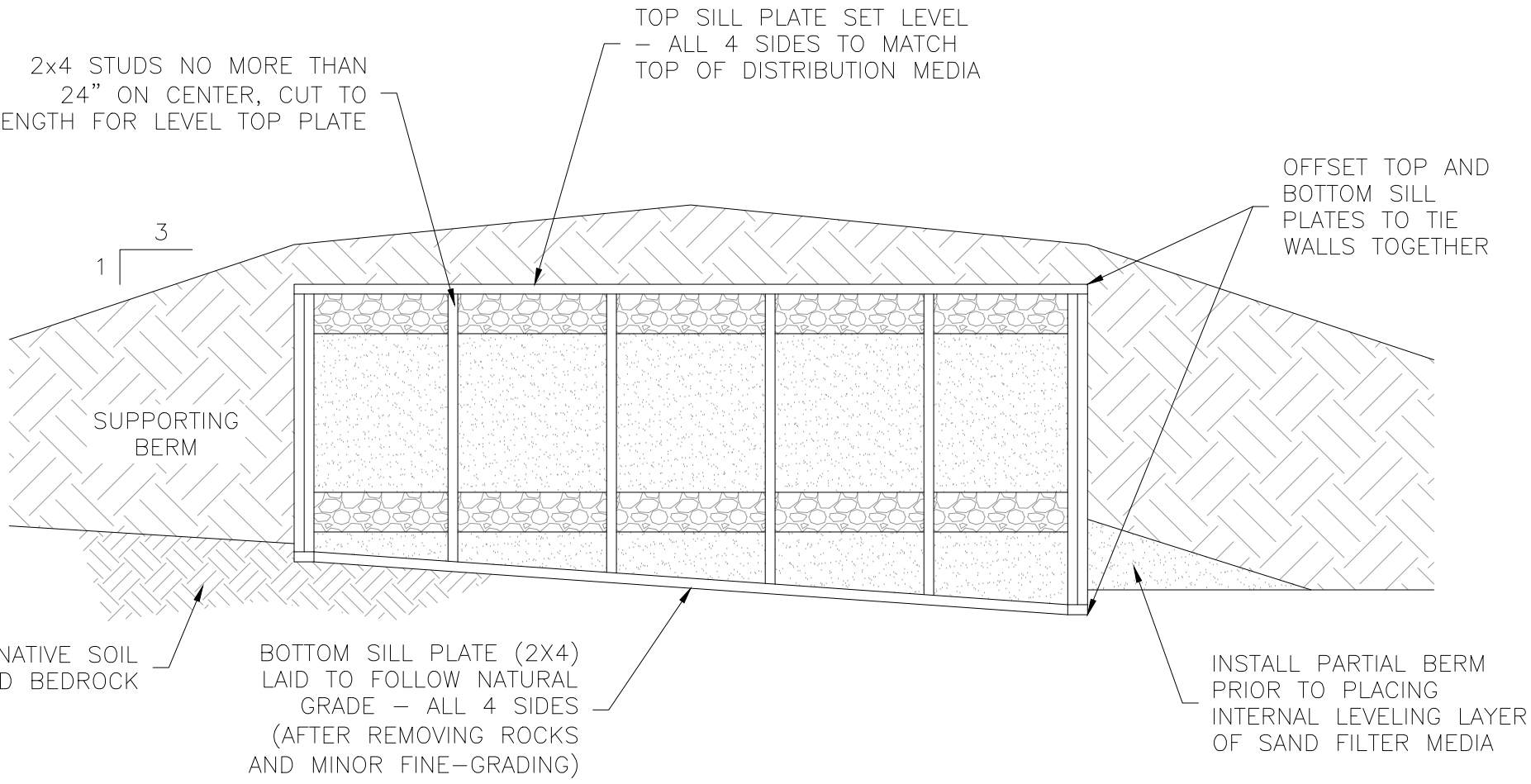


Figure 5. Sand Filter Box Detail

0 2'

1"=2'

PROJECT NUMBER: 2024039	Formal Variance T15S, R13E, Section 19DC, Tax Lot 1100
DATE: 12/6/2024	
DWG NO: 2024039 F1-4.DWG	Greg and Katie Sweet 4047 SW Wickiup Court Redmond, OR 97756
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	
REVISED:	ELKHORN CONSULTING LLC

2024039 F1-4.dwg December 5, 2024 DR702784

ELKHORN CONSULTING LLC

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

January 3, 2025

RECEIVED
JAN 10 2025
DEQ
Eastern Region Bend

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

SUBJECT: Formal Variance Request – Greg Sweet – T15S, R13E, Section 19DC, Tax Lot 1100 (0.46 acres), Deschutes County, West of Redmond, 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 4047 SW Wickiup Court, in the western part of Redmond in Deschutes County, Oregon (Site) (Figure 1) and consists of 0.46 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 June 2, 2000, and issued a denial on June 6, 2000. Their denial was based on insufficient soil depth in 2 test pits in the northwestern corner and north-central part of the lot. The test pits were described with sandy loam surface soils, a very high coarse fragment content below 12 to 13 inches, and bedrock at a depth of 18 to 24 inches below the existing ground surface (bgs). A copy of the site evaluation documentation from Deschutes County is attached in Appendix C. The primary reason cited for the denial was insufficient soil depth and insufficient area to install capping fill trenches in the area represented by Test Pits 1 and 2 (2000).

Soils

The web soil survey shows the location of the Site and a copy of the output is provided in Appendix D. The entire parcel is shown within a delineation of Map Unit 151D, Tetherow-Clovkamp complex, 8 to 50% slopes. Tetherow soils are typically moderately deep, excessively drained soils that developed in a mantle of volcanic ash over cinders on cinder cones. Clovkamp soils are typically deep, somewhat excessively drained soils that developed in volcanic ash on cinder cones.

None of the characteristics observed at the Site resemble the conditions expected from the published soil survey. The underlying bedrock is fractured basalt, not cinders. The observed soil characteristics are more like a deeper variant of Stukel soils, which are included in a delineation of Map Unit 141C, Stukel-Deschutes-Rock outcrop complex, 0 to 15% slopes mapped about 2,600 feet to the west-southwest. Stukel soils are typically shallow, well drained soils that developed in volcanic ash on lava plains. Deschutes soils are typically moderately deep, well drained soils that developed in volcanic ash on lava plains. The key difference between Stukel and Deschutes is the coarse fragment content and depth to bedrock.

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

A typical profile of Stukel soils is as follows:

- 4 inches of very dark gray sandy loam underlain by,
- 7 inches of dark brown cobbly sandy loam underlain by,
- 7 inches of dark brown gravelly sandy loam.

Preliminary Assessment

The Site was initially reviewed by EHC on October 2, 2024, along with J.D. Tschunko to excavate and evaluate test pits. EHC returned to the Site on October 31, 2024, to conduct a stake-out and collect field measurements and soil samples. The purpose was to review the Site conditions and assess the potential to design a modified bottomless sand filter that incorporates additional structural and fill elements to maintain adequate separation from the underlying bedrock. The proposed bottomless sand filter area is located on the highest ground, which is the area represented by Test Pits 1 and 2 (2024) shown on the site plan (northeastern part of the lot - see Figure 2).

Other Considerations

Although this parcel is within the city limits of City of Redmond, this parcel and developed parcels in the surrounding area are not served by the municipal sewer system. There are no sewer lines within 300 feet of the parcel, so although the sewer is legally available, it does not meet the definition of being physically available. However, this area is served by a community water system.

A search of the database of the Oregon Department of Water Resources was conducted for the section that the subject property lies within (Section 19 of Township 15 South, Range 13 East of the Willamette Meridian) and the section to the south (Section 30). There are about 39 records on file for Section 19 and 47 records on file for Section 30. There were 5 water well records (well logs) identified in Sections 19 and 30 pertaining to 4 wells that could be tied to specific parcels within about one-eighth of a mile of the subject property (Appendix E).

The nearest well that could be identified is about 600 feet south of the proposed bottomless sand filter area on Tax Lot 705 (now known as Tax Lot 200) in Section 30 and was completed on August 17, 2021, to a depth of 614 feet. Water was described as being first found at a depth of 513 feet in a layer of "Sandstone Brown" and had a static level of 509 feet below ground surface (bgs) on the date of completion with a reported yield of 20 gallons per minute (gpm) after 1.5 hours with air.

The next closest well is on Tax Lot 708 (now known as Tax Lot 800) in Section 30 and is about 670 feet south-southeast of the proposed bottomless sand filter area and was completed on May 10, 2002, to a depth of 575 feet. Water was described as being first found at a depth of 514 feet in a layer of "W.B. Brown Sandstone" and had a static level of 485 feet bgs on the date of completion with a reported yield of 20+ gpm with no drawdown after 1 hour with air.

The next closest well is on Tax Lot 703 (now known as Tax Lot 500) in Section 30 and is about 870 feet southwest of the proposed bottomless sand filter area and was completed on June 21, 1990, to a depth of 522 feet. Water was described as being first found at a depth of 479 feet in a layer of

"Brown Sandstone W. B." and had a static level of 479 feet bgs on the date of completion with a reported yield of 12 gpm with no drawdown after 1.5 hours with a bailer.

The well on Tax Lot 100 in Section 19 is about 920 feet north-northeast of the proposed bottomless sand filter area and was completed on August 1, 1979, to a depth of 600 feet. Water was described as being first found at a depth of 550 feet in a layer of "Water-Bearing Brwn. Sandstone" and had a static level of 500 feet bgs on the date of completion with a reported yield of 30 gpm with a "blow test" and 10 gpm with no drawdown after 1 hour with a bailer. This well serves Bentwood Community Water System and was deepened on August 24-25, 2022, to a depth of 787 feet. The water bearing zone is inferred to include all 4 additional layers described. However, it is most likely that the additional water is primarily from 2 layers of fractured basalt between 645 and 690 feet bgs and 770 and 787 feet bgs. The static water level on the date of completion was 575 feet with a reported yield of 500 gpm after 1 hour with air.

The regional groundwater gradient is expected to follow the surface topography to the west-southwest for any near-surface saturated zones that may perch on the upper surface of the bedrock with the deeper aquifer(s) to the west or northwest toward the Deschutes River (depending on the tilt of the lithology). According to the interactive map for Oregon Domestic Well Testing, this part of Deschutes County has an average nitrate-nitrogen concentration in domestic wells of 1.34 milligrams per liter (mg/L) with 5.68% exceeding 3 mg/L and none exceeding 10 mg/L (based on 88 test results).[2] A review of the chemical test results for the Bentwood Estates Water System show the most recent nitrate concentration was 1.3 mg/L, which is consistent with the concentrations found in the area.

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)(a) – which states that saprolite; fractured bedrock; gravel; or sand, loamy sand, or sandy loam occur in a continuous section at least 2 feet thick in contact with and below the bottom of the sand filter.[1]

The primary issues are related to the variation in the surface of the underlying bedrock and the slope. There is insufficient depth to bedrock at the high corner to enable the sand filter to be countersunk and allow the low corner to be at or below the ground surface. This request seeks to overcome the limitations of this Site by elevating the bottomless sand filter such that the minimum 2-foot thick requirement is at least met at the high corner of each bottomless sand filter (initial and replacement.

[2] ARC GIS Online. (n.d.). Oregon domestic well testing, [Data file]. Retrieved January 2, 2025, from ARC GIS Online: https://www.arcgis.com/apps/MapSeries/index.html?appid=c0d7daea497049c1a686d07dab7106e5

Another potential issue that could be raised is the ability of the underlying bedrock to accept and transmit the treated effluent without hindering the performance of the sand filter. The developed property to the east, located at 4005 SW Wickiup Court, has a standard serial distribution drainfield. No records could be found for the original system but 155 linear feet of additional trenches were installed in 1996 across the property line from the proposed bottomless sand filters (about 30 feet to the east and upslope). A review of historical aerial photographs on Google Earth does not indicate any signs of hydraulic stress – there are no green patches or stripes during periods without irrigation (the lawn area is currently irrigated and a uniform green color during the growing season). It is reasonable to conclude that after more than 30 years of use the bedrock appears to be adequately absorbing the effluent. In addition, there was no indication of elevated moisture in the test pits in the vicinity of the proposed bottomless sand filters, which are located downgradient from the adjacent drainfield. The same can be said for the drainfields on the properties to the north and west that are preceded by lined sand filters.

This request seeks to overcome the limitations of this Site by treating the sewage through the use of a recirculating textile filter system (AdvanTex® AX20RTN-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 modified bottomless sand filter is used to achieve the pathogen reduction requirements of TS2 and, therefore, this configuration does not have or need an ultraviolet disinfection unit. The "B" designation indicates the RT unit is configured with the second pump for the final discharge to the modified bottomless sand filter. The use of a system meeting the requirements of TS 2 is proposed to enhance the protection of human health and the environment for this Site.

The initial and replacement bottomless sand filter areas are proposed on the highest ground in the northeastern part of the parcel represented by supplemental Test Pits 1 and 2 (2024). This represents an area with the appropriate spatial footprint and meets all required horizontal setback requirements. These test pits were described by Brian Rabe on October 31, 2024. Test Pit 1 was excavated near the upper end of the proposed initial bottomless sand filter and Test Pit 2 was excavated near the upper end of the proposed replacement bottomless sand filter.

Test Pit 1 (2024) was described as:

- Dark brown (10YR 3/3) stony fine sandy loam from 0 to 10 inches with weak subangular blocky structure, with many coarse, medium, fine, and very fine roots and 30% coarse fragments, underlain by,
- Dark brown (10YR 3/3) extremely cobbly fine sandy loam from 10 to 24 inches with ith common coarse, medium, and fine roots, and 70% rock fragments, underlain by,
- Weathered bedrock from 24 to 27 inches, underlain by,
- Bedrock at 27 inches.

Test Pit 2 (2024) was described as:

- Dark brown (10YR 3/3) stony fine sandy loam from 0 to 10 inches with moderate subangular blocky structure, with many medium, fine, and very fine roots and 20% coarse fragments, underlain by,
- Dark brown (10YR 3/3) very cobbly fine sandy loam from 10 to 19 inches with weak subangular blocky structure, with common coarse, medium, and fine roots, and 40% rock fragments, underlain by,
- Bedrock at 19 inches.

Soil samples were collected from both test pits from a depth of 5 to 10 inches bgs. The soil samples were sent to a laboratory for texture analysis using the standard hydrometer method. The results of both samples were confirmed to be sandy loam. A copy of the lab report is attached in Appendix F.

The highest level of the underlying bedrock is expected to be 27 inches bgs at the highest point within the area proposed for the initial sand filter and 18 inches bgs at the highest point within the area proposed for the replacement sand filter. The primary issue is that slope averages about 5% (initial) and 3% (replacement) where the sand filters are proposed (ranges between 2.8 and 6.6% based on elevation measurements at all 4 corners of each proposed sand filter). The slope is downward toward the west.

The proposed system seeks to overcome this limitation by elevating a 250-square foot modified bottomless sand filter in a manner that provides 3 inches more than the required minimum of 24 inches from the highest level of the underlying bedrock at the highest corner of each sand filter and substantially more (an additional 8 inches or more for the initial sand filter and 4 inches or more for the replacement sand filter) in the lowest corner (Figures 3A and 3B). The sod and underlying sandy soil, along with any surface rock, to a depth of at least 3 inches within the footprint of the sand filter will be excavated and replaced with up to 3 inches or 9 inches of sand filter media at the high corner of the initial and replacement sand filters, respectively. This will be used to exceed the minimum 24-inch separation from shallowest underlying bedrock by 3 inches. An additional 8 inches or 14 inches of sand filter media will be needed at the low corner of the initial and replacement sand filters, respectively, providing a total separation of 35 inches or 31 inches or more. The base of the sand filter container (framed wooden box) is proposed to follow the surface (countersunk 3 inches) to provide uniform contact of the imported sand filter media with the underlying soil and fractured rock (Figure 5). 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 topsoil cover.

The extreme depth of the local water table and the numerous basalt flows between the surface and the underlying water table support a conclusion that the risk to the underlying groundwater from the proposed system is very low.

As described, the proposed combination of treatment components are 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.

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 1-5, Appendices A-G
c: Greg Sweet
Todd Cleveland, REHS – Deschutes County

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

FIGURES

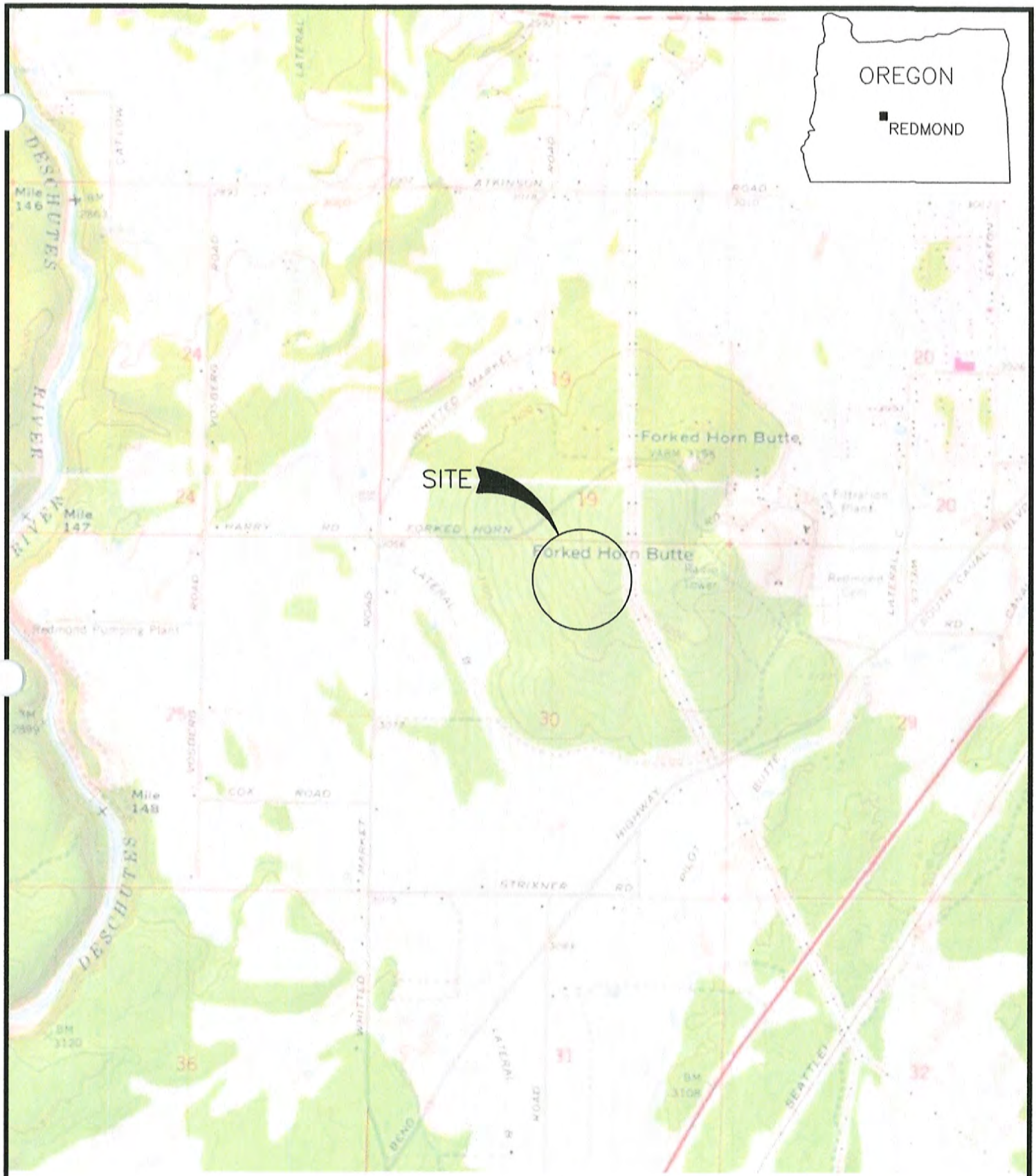


Figure 1. Vicinity Map

0 2,000'

1" = 2,000'

(LOCATIONS AND SCALE ARE APPROXIMATE)

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

PROJECT NUMBER: 2024039	Formal Variance T15S, R13E, Section 19DC, Tax Lot 1100
DATE: 12/6/2024	
DWG NO: 2024039 F1-4.DWG	Greg and Katie Sweet 4047 SW Wickiup Court Redmond, OR 97756
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	
REVISED:	ELKHORN CONSULTING LLC

C:\Users\dr702784\OneDrive - Valmont Industries\Desktop\Working Drafting DJR\2024039 Sweet Variance\DWG\2024039 F1-4.dwg December 5, 2024 DR702784

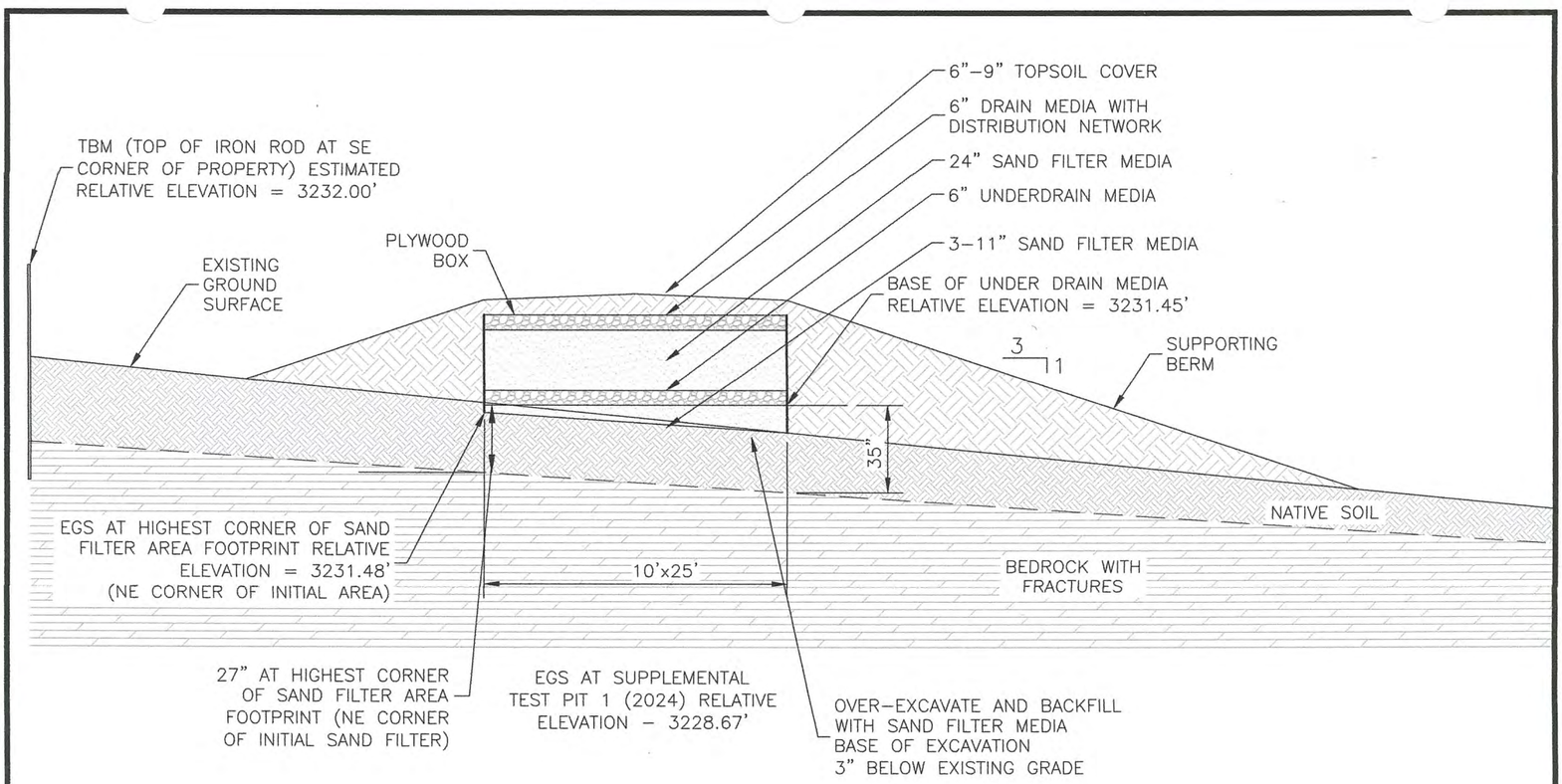


Figure 3A. Modified Bottomless Sand Filter Section – Initial

0 5'
1"=5'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG NO: 2024039 F1–4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

2024039 F1–4.dwg December 5, 2024 DR702784

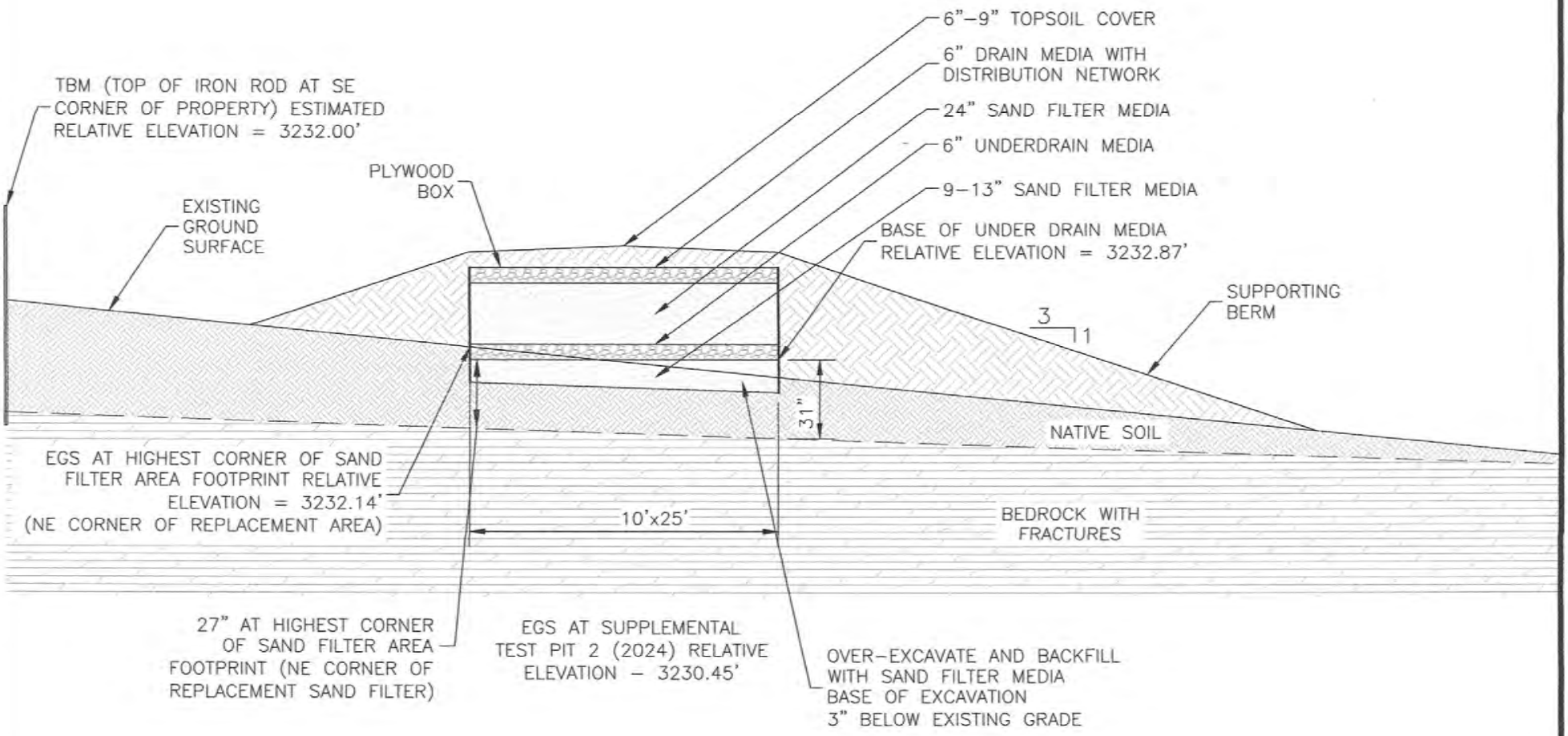


Figure 3B. Modified Bottomless Sand Filter Section – Replacement

0 5'

1"=5'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG NO: 2024039 F1–4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

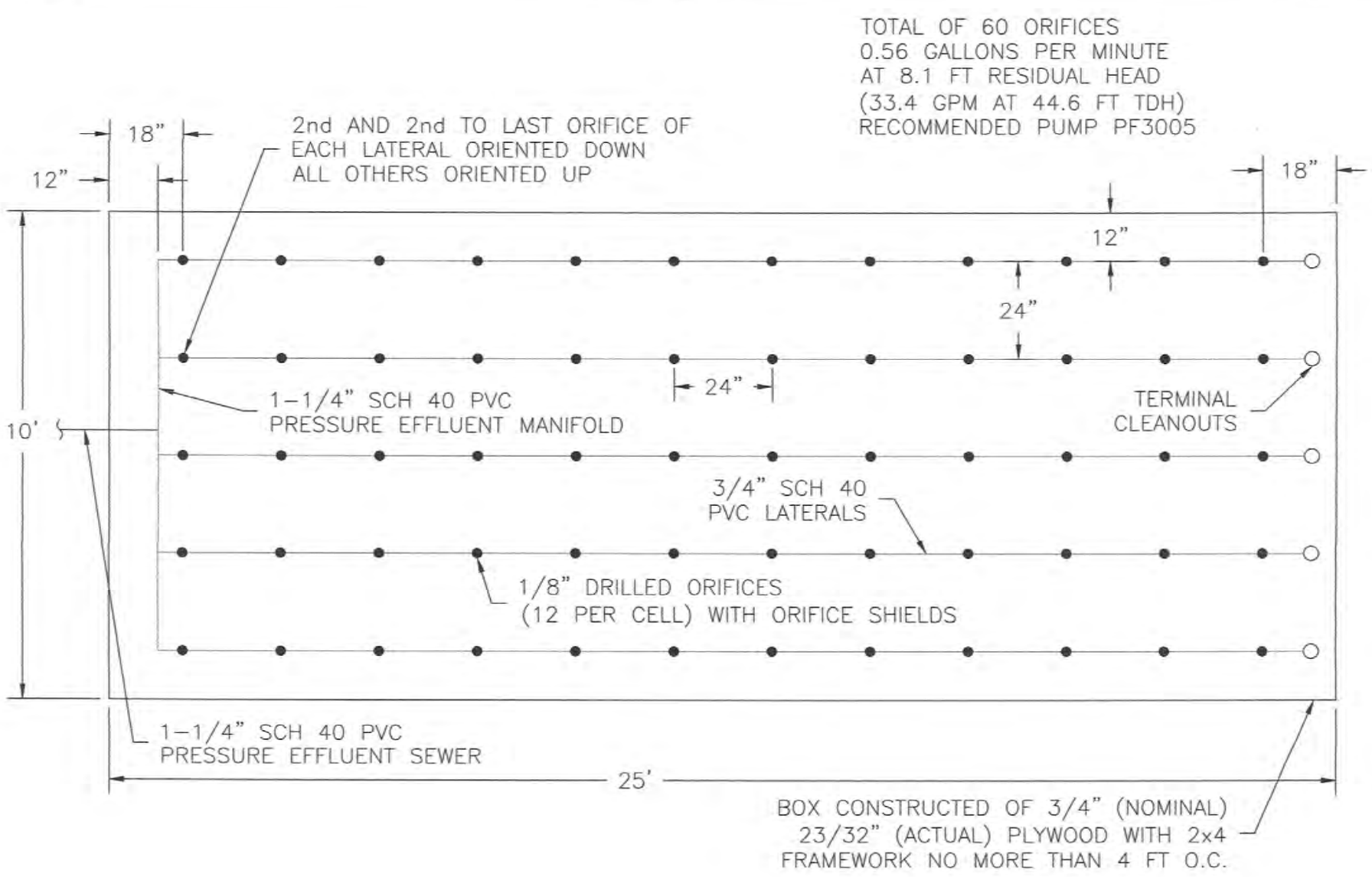


Figure 4. Sand Filter Plan Detail

0 4'

1"=4'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG. NO: 2024039 F1-4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

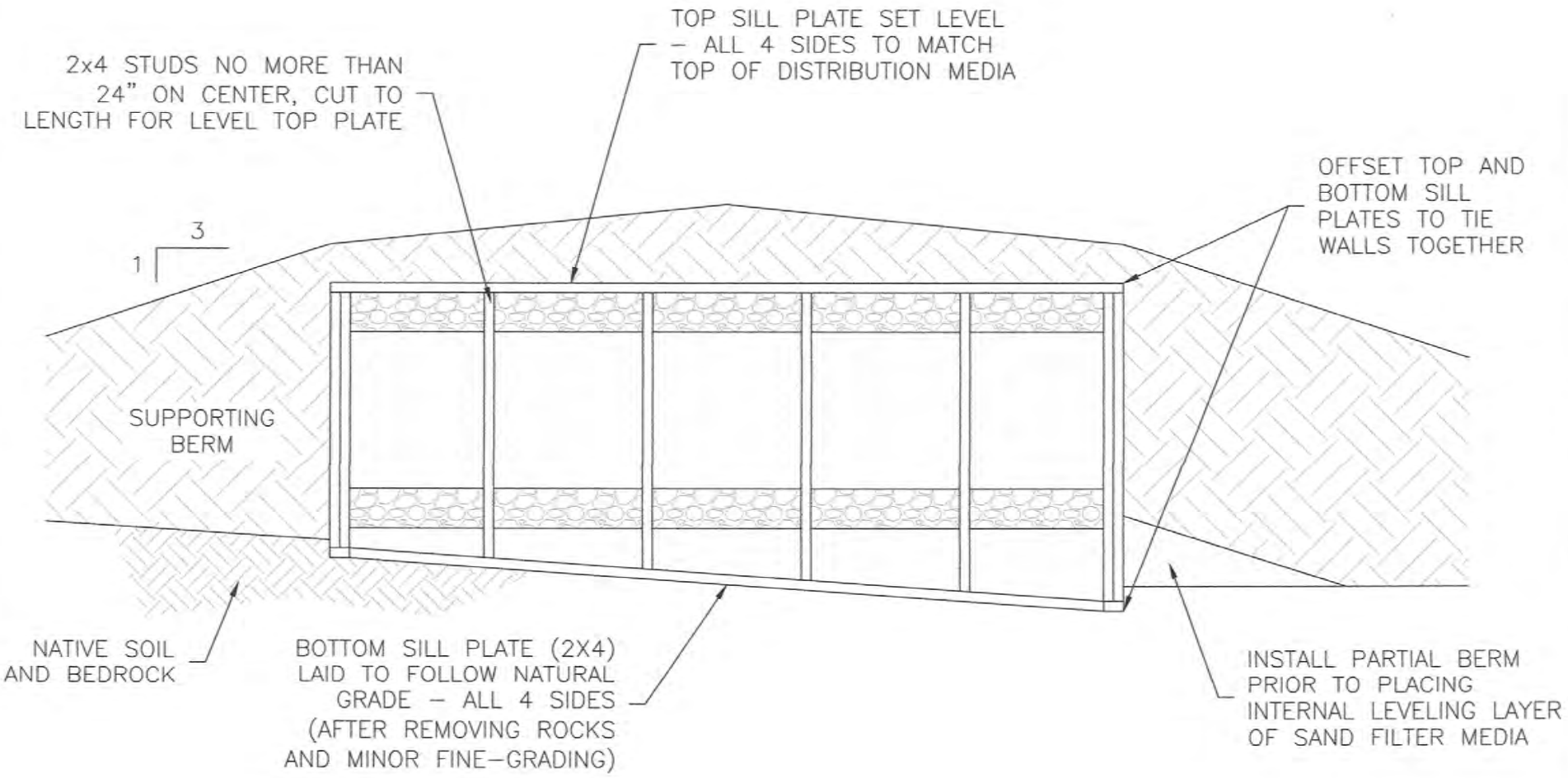


Figure 5. Sand Filter Box Detail

0 2'

1"=2'

PROJECT NUMBER: 2024039	Formal Variance
DATE: 12/6/2024	T15S, R13E, Section 19DC, Tax Lot 1100
DWG NO: 2024039 F1–4.DWG	Greg and Katie Sweet
DWG BY: 6DJR / PROJECT MANAGER: 1BTR	4047 SW Wickiup Court
REVISED:	Redmond, OR 97756
	ELKHORN CONSULTING LLC

2024039 F1–4.dwg December 5, 2024 DR702784

APPENDICES

Appendix A.	**Tax Lot Map**
Appendix B.	**Deed**
Appendix C.	**Site Evaluation Reports**
Appendix D.	**NRCS Soil Report**
Appendix E.	**Water Well Report**
Appendix F.	**Soil Test Results**
Appendix G.	**Directions to Site, List of Names and Addresses for Neighboring Property Owners**

Appendix A.

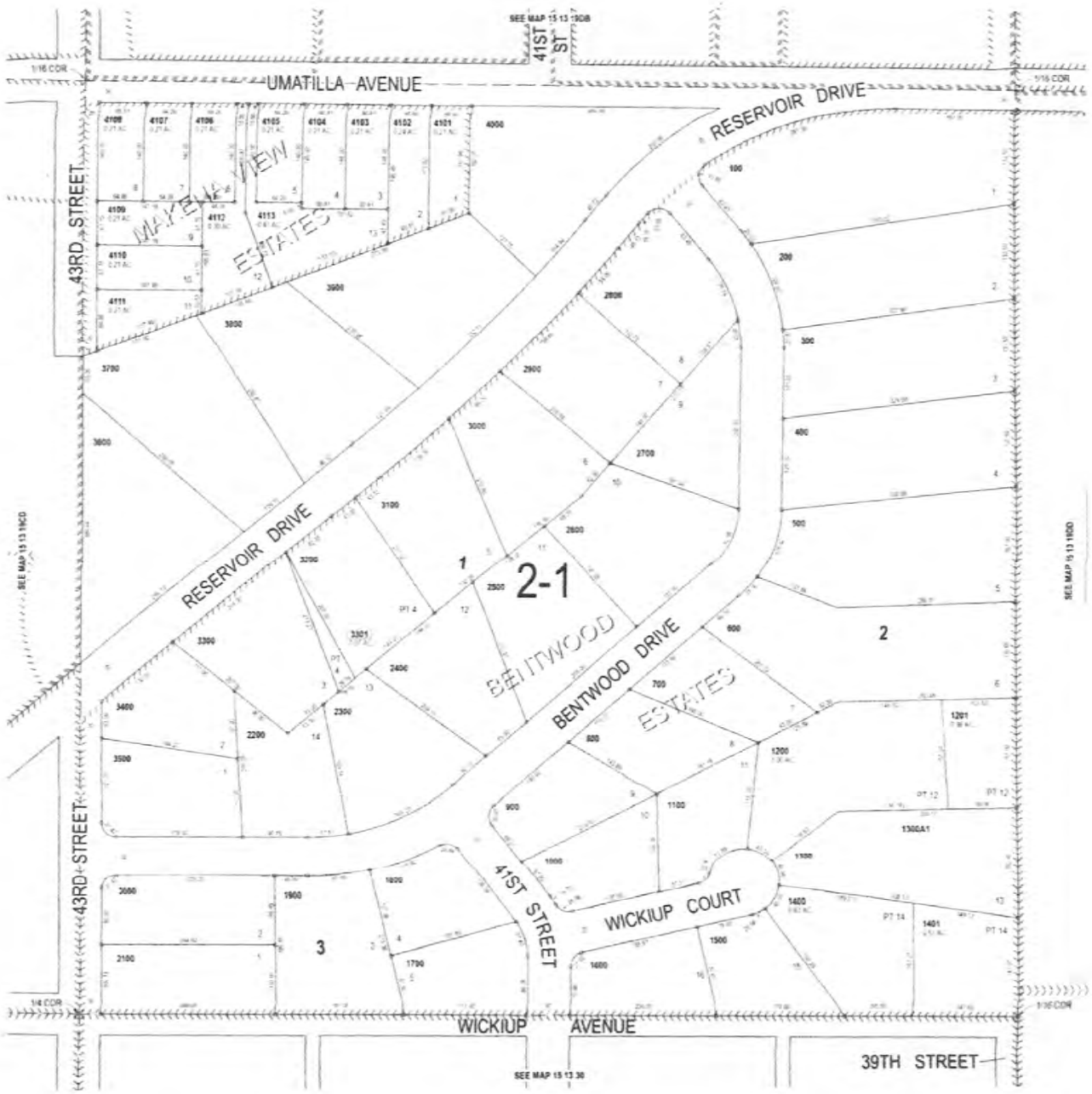
Tax Lot Map

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

5/23/2019

S.W.1/4 S.E.1/4 SEC.19 T.15S. R.13E. W.M.
DESCHUTES COUNTY
1" = 100'

15 13 19DC



15 13 19DC

Appendix B.

Deed

86-14530

VOL 128 PAGE 507

STATUTORY WARRANTY DEED

SUNRIDGE LAND CO., INC., an Oregon Corporation, Grantor, conveys and warrants to GREG K. SWEET, Grantee, the following described real property free of encumbrances except as specifically set forth herein:

Lot Eleven (11), in Block Two (2), in BENTWOOD ESTATES, Deschutes County, Oregon.

SUBJECT TO AND EXCEPTING:

1. Those exceptions normally appearing in a title insurance policy, and easements and rights of way of record and those appearing on the land.

2. Easement, as granted to the City of Redmond, and recorded on November 10, 1921 in Book 32, Page 165, Deed records.

3. Easement, as granted to the United States of America and recorded on August 2, 1951 in Book 98, Page 214, Deed records, and as re-recorded on August 22, 1960, in Book 125, Page 552, Deed records.

4. Easement as grnated to Central Electric Cooperative, Inc., a cooperative corporation, and recorded on March 5, 1957 in Book 115, Page 439, Deed records.

5. Easement as shown on the official plat of said land for public utilities and building setback lines.

6. Covenants, Conditions and Restrictions as contained in instrument recorded November 2, 1978, in Book 286, Page 869, Deed records.

The true and actual consideration for this conveyance is TEN THOUSAND FIVE HUNDRED AND NO/100 DOLLARS ($10,500.00).

Until a change is requested, all tax statements are to be sent to the following address: 105 N. W. Allen, Bend, Oregon 97701.

DATED this 30th day of March, 1979.

SUNRIDGE LAND CO., INC.

BY: Jason B. Kitchell (Pres.)

BY: Beverlee A. Kitchell, secretary

STATE OF OREGON)
) ss
County of Deschutes)

On this 2nd day of April 1979, personally appeared the

above named JAMES B. KITCHELL and BEVERLEE A. KITCHELL, who, being duly sworn each for himself and not for the other, did say that the former is the president of SUNRIDGE LAND CO., INC., and that the latter is the secretary of SUNRIDGE LAND CO., INC., a corporation and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and each of them acknowledged said instrument to be its voluntary act and deed.

Before Me:

Notary Public for Oregon
My Commission Expires: 4/5/82

STATE OF OREGON)
COUNTY OF DESCHUTES) SS.

I, MARY SUE PENHOLLOW, COUNTY CLERK AND RECORDER OF CONVEYANCES, IN AND FOR SAID COUNTY, DO HEREBY CERTIFY THAT THE WITHIN INSTRUMENT WAS RECORDED THIS DAY:

1986 JUL 30 PM 3:22

MARY SUE PENHOLLOW
COUNTY CLERK

BY. P. Reed DEPUTY
NO. 86-14530 FEE 14-
DESCHUTES COUNTY OFFICIAL RECORDS

Appendix C.

Site Evaluation Reports

CDD ARCHIVE COVER SHEET FOR JMM
12/09/2002 07:49:05 1 of 1

EH 001 ARCHIVE

FILE ID	151319DC01100EH20021209999001
TAXMAP	151319DC01100
SERIAL	156717
DIVISION	EH
SITUS	4047 SW WICKIUP CT
HOUSE#	4047
STREET	WICKIUP
CONTENT	ARCHIVE

DESCHUTES COUNTY

Community Development Department

Planning Division · Building Safety Division · Environmental Health Division

117 NW Lafayette Avenue · Bend, Oregon · 97701-1925
(541) 388-6575 · FAX (541) 385-1764
http://newberry.deschutes.org

JUNE 6, 2000

GREG SWEET
1204 NW MILWAUKEE AVE
BEND OR 97701

RE: SITE EVALUATION #F19663 : 15-13-19DC-1100
4047 SW WICKIUP CT,RE

Dear Mr Greg Sweet

This letter is in response to your on-site sewage disposal system site evaluation conducted on June 6, 2000 . The test pits showed that this site was unsuitable for any on-site sewage disposal system. See enclosed worksheet.

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 (DEQ). The application is a written request that includes all information you have received from Deschutes County, the reason the report is in error, citing the specific OAR's that conflict with the report, and an application fee. DEQ will review the county report and visit the site to determine compliance with the appropriate rules.

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

This property however, has severe limitations for on-site sewage disposal, as noted in the above report. Unless public health and environmental protection is assured, a variance request cannot be supported by the Deschutes County Environmental Health Division, and will not likely be approved by DEQ.

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

You may have additional test pits examined by this division within 90 days of the initial site evaluation with no additional charge, or you may apply for a site evaluation report review conducted by the Department of Environmental Quality.

Sincerely,

ENVIRONMENTAL HEALTH DIVISION
Roger W. Everett, Director

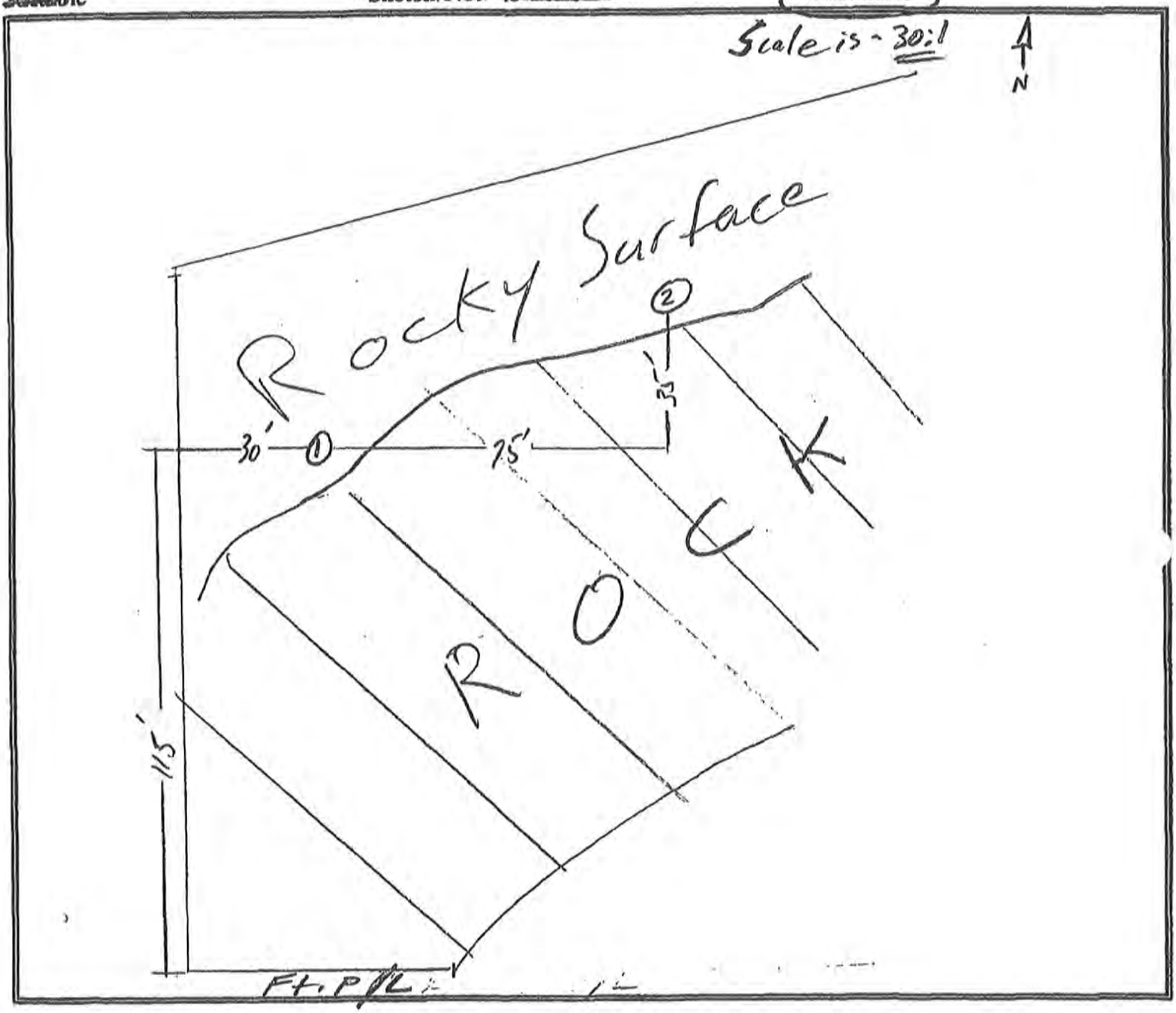
Garth D. Cook, RS

Garth D Cook
Sanitarian

RWE/GDC /lrl
Enclosure

SITE EVALUATION FIELD INSPECTION FORM

Applicant: Sweet, Greg Site Evaluation # F-19663
Date: 6.2.00 Subdivision: Bluntwood Estates L 11 B 2 Parcel Size 0.2±
Evaluator: Garth D. Cook T 15 R 13 S 19DC TL 1100
~~Suitable~~ ~~Sketch/Plot to Scale~~ Unsuitable



System type approved:
Initial _____
Replacement _____
Tank Size _____

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

Special Conditions: This lot is denied for installation of an on-site sewage disposal system due to lack of minimum required soil depth in conjunction with lack of approvable sufficient installation area.

SITE EVALUATION FIELD INSPECTION FORM

Applicant: ____________ Site Evaluation # F-19663

Evaluator: Garth D. Cook Date: 6/00 Parcel Size: 0.25 A

Subdivision: ____________ T ____ R ____ S ____ TL ____ L ____ B ____

DEPTH	TEXTURE	COLOR	Notes on mottling, roots, structure, layer limiting effective soil depth, % loose rock, etc.
0-12"	SL		
12-(18-24")			Roots to (18"-24"); Basalt, weathering Rock material, cobblestone; ROB;
			LLESD at 18"-24". S.L. to 18"-24"
			with moderate cementation and
			weathering rock material.
0-8"	SL		
8-13"	SL		50-75+% Fractured basalt, basalt,
			Coarse fragments, weathering
			rock material; roots to 13"; ROB;
			LLESD at 13".
13-24"			99% Rock

Landscape notes ____________

Slope ____________ Aspect ____________ Groundwater None observed

Other site notes ____________

Comments: ____________

Reason for Unsuitability: (Include Rule Reference) 340-071-0220 (1)(a); 340-071-0265 (1)(h); 340-071-0275 (1)&(2); 340-071-0290 (3)(d) 340-071-0290 (5)

(MJZ-8/95)

BESCHUTES COUNTY

Community Development Department

Planning Division • Building Safety Division • Environmental Health Division

1117 NW Lafayette Avenue • Bend, Oregon • 97701-1925
(541) 388-6575 • FAX (541) 385-1764
http://newberry.deschutes.org

MAY 18, 2000

GREG SWEET
1204 NW MILWAUKEE AVE
BEND OR 97701

Re: Septic Permit F #19663
4047 SW WICKIUP CT, REDMOND
15-13-19DC-1100

Dear Greg Sweet

You recently completed a septic feasibility application application for property at the above address. That application is incomplete or cannot be processed for the following reason:

Submit a copy of a recorded easement which allows for a septic absorption facility installation within the BPA easement area. Submit a scaled plat map copy which shows this septic easement area.

Please respond at your earliest convenience. When this is corrected, your application will be processed as soon as possible.

If you have any questions, please call this office.

Sincerely,

ENVIRONMENTAL HEALTH DIVISION
Roger W. Everett, Director

Garth D. Cook, RS

Garth D Cook
Sanitarian

RWE/GDC /lrl

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

4047 SW Wickiup Ct

November 20, 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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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 (4047 SW Wickiup Ct)

Map Scale: 1:406 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: May 7, 2020—Jun 2, 2020

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 (4047 SW Wickiup Ct)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
151D	Tetherow-Clovkamp complex, 8 to 50 percent slopes	0.5	100.0%
Totals for Area of Interest		**0.5**	**100.0%**

Map Unit Descriptions (4047 SW Wickiup Ct)

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

151D—Tetherow-Clovkamp complex, 8 to 50 percent slopes

Map Unit Setting

National map unit symbol: 241y
Elevation: 2,500 to 4,000 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 52 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tetherow and similar soils: 55 percent
Clovkamp and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tetherow

Setting

Landform: Cinder cones
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, nose slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over cinders

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 24 inches: cobbly sandy loam
H3 - 24 to 60 inches: cinders

Properties and qualities

Slope: 8 to 50 percent
Depth to restrictive feature: 14 to 28 inches to strongly contrasting textural stratification
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R010XA014OR - Juniper Cinder Hills 10-12 PZ
Hydric soil rating: No

Description of Clovkamp

Setting

Landform: Cinder cones
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash

Typical profile

H1 - 0 to 12 inches: loamy sand
H2 - 12 to 24 inches: loamy sand
H3 - 24 to 40 inches: gravelly loamy fine sand
H4 - 40 to 50 inches: extremely gravelly sand
H5 - 50 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 35 to 50 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R010XA009OR - Juniper Shrubby Pumice Flat 10-12 PZ
Hydric soil rating: No

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Appendix E.

Water Well Report

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

DESC 62850
8/19/2021

WELL I.D. LABEL# L 143623
START CARD # 1051619
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name FRED Last Name STEELE
Company
Address 3090 SW 41ST ST
City REDMOND State OR Zip 97756

(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

[X] Rotary Air [ ] 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 614.00 ft.

BORE HOLE

Dia	From	To
12	0	18.5
8	18.5	597
6	597	614

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	18.5	13	S
		Calculated	9	
		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
●	○	8	X	1.5	18.5	.250	●	○		
○	●	6		3	597	.188	●	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

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

(7) PERFORATIONS/SCREENS

Perforations Method MACHINE
Screens Type Material

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Liner	6	577	597	.125	3	228	

(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		590	1.5

Temperature 54 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 118 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County DESCHUTES Twp 15.00 S N/S Range 13.00 E E/W WM
Sec 30 NW 1/4 of the NE 1/4 Tax Lot 705
Tax Map Number Lot
Lat ° ' " or 44.24669444 DMS or DD
Long ° ' " or -121.21591667 DMS or DD
(●) Street address of well ( ) Nearest address
3090 41ST REDMOND,OR

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	8/17/2021			509

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 513.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
8/13/2021	513	597	20			509

(11) WELL LOG

Ground Elevation 3217.00

Material	From	To
SAND PUMICE	0	2
BASALT BROWN	2	183
BASALT GRAY	183	200
CINDERS RED	200	211
BASALT RED	211	243
BASALT GRAY	243	345
BASALT RED BROWN LAYERS	345	370
SAND POCKET BROWN	370	380
SANDSTONE BROWN	380	410
BASALT GRAY	410	513
SANDSTONE BROWN	513	614

Date Started 8/11/2021 Completed 8/17/2021

(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 758 Date 8/19/2021
Signed THOMAS PECK (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 1720 Date 8/19/2021
Signed JACK ABBAS (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 - continuation page

DESC 62850

8/19/2021

WELL I.D. LABEL# L	143623
START CARD #	1051619
ORIGINAL LOG #	

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

Water Quality Concerns

From	To	Description	Amount	Units

(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

(10) STATIC WATER LEVEL

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

(11) WELL LOG

Material	From	To

(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

Comments/Remarks

4 YARDS SANDGROUT 263 FEET - 405 FEET

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

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

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

DESC 62850

8/19/2021

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: 44.24669444 Datum: WGS84
Longitude: -121.21591667
Township/Range/Section/Quarter-Quarter Section:
WM15.00S13.00E30NWNE
Address of Well:
3090 41ST

Well Label: 143623

Printed: August 19, 2021

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

WELL I.D. # L 56210
START CARD # 147258

(1) LAND OWNER Well Number
Name Craig Davis
Address 4800 S.W. Badger
City Redmond State Ore. Zip 97756

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

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12	0	18½	Bentonite	0	18½	9 SACKS
8	18½	575				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other Poured in 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:	8	+1½	18½	.250	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	6	-6	576	.188	☒	☐	☒	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☒ Outside ☐ None
Final location of shoe(s) 6" @ 576

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

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
546	566	⅛ x 4	228	6		☐	☒
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
20+	0	570	1 hr

Temperature of water 56 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 15 N or ☒ S Range 13 ☐ E or W. WM.
Section 30 NW 1/4 NE 1/4
Tax Lot 708 Lot 4 Block Subdivision
Street Address of Well (or nearest address) 41st. Redmond, Ore.

(10) STATIC WATER LEVEL:
485 ft. below land surface. Date 5-10-02
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 514

From	To	Estimated Flow Rate	SWL
514	575	20+	485

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Top Soil	0	2	
Red Cinders	2	11	
Mild Lava	11	205	
Red Cinders	205	240	
Hard Lava	240	277	
Mild Brown Lava	277	331	
Hard Gray Lava	331	354	
Brown Sand Stone	354	514	485
Wh. Brown Sand-stone	514	575	

RECEIVED
MAY 15 2002
WATER RESOURCES DEPT
SALEM, OREGON

Date started 5-9-02 Completed 5-10-02

(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 1276
Signed Date 5-10-02

(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 1255
Signed Date 5-10-02

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

STATE OF OREGON

WATER WELL REPORT
(as required by ORS 537.765)

(DESC 001 [illegible])

(START CARD) # 19557

(1) OWNER:

Well Number: ____

Name Truman Davis

Address 8061 N.W. Oasis Drive

City Redmond, State OR Zip 97756

(2) TYPE OF WORK:

☒ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD

☒ Rotary Air ☐ Rotary Mud ☒ Cable

☐ Other ____

(4) PROPOSED USE:

☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation

☐ Thermal ☐ Injection ☐ Other ____

(5) BORE HOLE CONSTRUCTION:

Special Construction approval Yes ☐ No ☒ Depth of Completed Well 522 ft.

Explosives used Yes ☐ No ☒ Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
12 in.	0	19	Bentonite	0	19	8
8 in.	19	380				
6 in.	380	522				

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:	8 in.	0	19	.250	☒	☐	☒	☐
	6 in.	19	340	.188	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS:

☒ Perforations Method ____

☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
340	380	1/4 in.	240	6 in.	0.250	☒	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

☐ Pump ☒ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
12	0	520	~~1 hr.~~ 1.5hr.

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 15S N or S, Range 13 E or W, WM.

Section 30 NW ¼ NE ¼

Tax Lot 703 Lot ____ Block ____ Subdivision ____

Street Address of Well (or nearest address) ____

(10) STATIC WATER LEVEL:

479 ft. below land surface. Date 6-21-90

Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:

Depth at which water was first found 479 feet

From	To	Estimated Flow Rate	SWL
479	522		

(12) WELL LOG:

Ground elevation ____

Material	From	To	SWL
Top soil and boulders	0	2	
Mild brown lava	2	232	
Red conglomerate	232	260	
Hard red basalt	260	268	
Hard gray basalt	268	293	
Mild black basalt	293	314	
Red conglomerate	314	331	
Mild red basalt	331	345	
Red cinders and sand	345	375	
Red sandstone	375	392	
Light brown sandstone	392	435	
Mild brown basalt	435	460	
Brown sandstone	460	479	
Brown sandstone W.B.	479	522	479

Date started 4-16-90 Completed 6-21-90

(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 well construction standards. Materials used and information reported above are true to my best knowledge and belief.

WWC Number ____

Signed [signature] 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 well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1385

Signed Robert Bucker Date 6-25-90

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 3931

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

State Well No. 15s/13E-19dc
State Permit No.

(1) OWNER:
Name Jim Kitchell
Address Rt. 1, Box 365
Terrebonne, Oregon 97760

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

(3) TYPE OF WELL:
Rotary [X] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [ ] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [X]

(5) CASING INSTALLED:
Threaded [ ] Welded [ ]
8 " Diam. from 1½ ft. to 30½ ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

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

(7) SCREENS:
Well screen installed? [ ] Yes [X] 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 [X] No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Blow Test- 30 G.P.M. " "
" " " "
Bailer test 10 gal./min. with 0 ft. drawdown after 1 hrs.
Artesian flow g.p.m.
Temperature of water 53* Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used cement
Well sealed from land surface to 30½ ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 8 in.
Number of sacks of cement used in well seal 11 sacks
How was cement grout placed? pressure grout

Was a drive shoe used? [ ] Yes [X] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Deschutes Driller's well number
SW ¼ SE ¼ Section 19 T. 15S R. 13E W.M.
Bearing and distance from section or subdivision corner
(Forked Horn Butte)

(11) WATER LEVEL: Completed well.
Depth at which water was first found 550 ft.
Static level 500 ft. below land surface. Date 8-1-79
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 600. ft. Depth of completed well 595 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 Top-Soil	0	2	
Brown Conglomerate	2	200	
Red Cinders	200	260	
Lava	260	400	
Red Cinders	400	410	
Broken Sandstone Conglomerate	410	550	
Water-Bearing Brwn. Sandstone	550	600	

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AUG 9 - 1979
WATER RESOURCES DEPT
SALEM, OREGON

Work started 8-22 19 78 Completed 8-1 19 79
Date well drilling machine moved off of well 8-1 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] William D. Allen (Drilling Machine Operator) Date 8-1, 19 79
Drilling Machine Operator's License No. 803

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 Orvail Buckner Well Drilling, Inc. (Person, firm or corporation) (Type or print)
Address 1686 N.E. Negus Way, Redmond, Ore. 97756
[Signed] (Water Well Contractor)
Contractor's License No. 608 Date 8-1, 19 79

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

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

DESC 63587
8/29/2022

WELL I.D. LABEL# L 148522
START CARD # 1058173
ORIGINAL LOG # DESCHUTES 3931

(1) LAND OWNER
Owner Well I.D.
First Name RON Last Name WESTENDORF
Company BENTWOOD WATER
Address 2866 SW BENTWOOD DR
City REDMOND State OR Zip 97756

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

(2a) PRE-ALTERATION
	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

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

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

(5) BORE HOLE CONSTRUCTION
Special Standard ☐ (Attach copy)
Depth of Completed Well 787.00 ft.

BORE HOLE

Dia	From	To
8	0	787

SEAL

Material	From	To	Amt	sacks/lbs
		Calculated		
		Calculated		

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other DID NOT DISTURB
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

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)
500		780	1

Temperature 54 °F Lab analysis ☐ Yes By
Water quality concerns? ☐ Yes (describe below) TDS amount 110 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County DESCHUTES Twp 15.00 S N/S Range 13.00 E E/W WM
Sec 19 SW 1/4 of the SE 1/4 Tax Lot 100
Tax Map Number Lot
Lat ° ' " or 44.25090256 DMS or DD
Long ° ' " or -121.21544428 DMS or DD
◉ Street address of well ○ Nearest address
2650 SW BENTWOOD DR DESC

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration	8/24/2022			575
Completed Well	8/25/2022			575

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 575.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
8/25/2022	600	787	500			575

(11) WELL LOG
Ground Elevation

Material	From	To
NONE	0	600
SANDSTONE CONGLOMERATE BROWN	600	645
BASALT GRAY FRACTURED	645	690
CONGLOMERATE BROWN	690	770
BASALT GRAY FRACTURED BROKEN	770	787

Date Started 8/24/2022 Completed 8/25/2022

(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 758 Date 8/27/2022
Signed THOMAS PECK (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 1720 Date 8/27/2022
Signed JACK ABBAS (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 - continuation page

DESC 63587

8/29/2022

WELL I.D. LABEL# L	148522
START CARD #	1058173
ORIGINAL LOG #	DESCHUTES 3931

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

Water Quality Concerns

From	To	Description	Amount	Units

(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

(10) STATIC WATER LEVEL

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

(11) WELL LOG

Material	From	To

(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)

Comments/Remarks

DOWN HOLE HAMMER FLOODED OUR AT BOTTOM OF HOLE

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

DESC 63587

8/29/2022

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

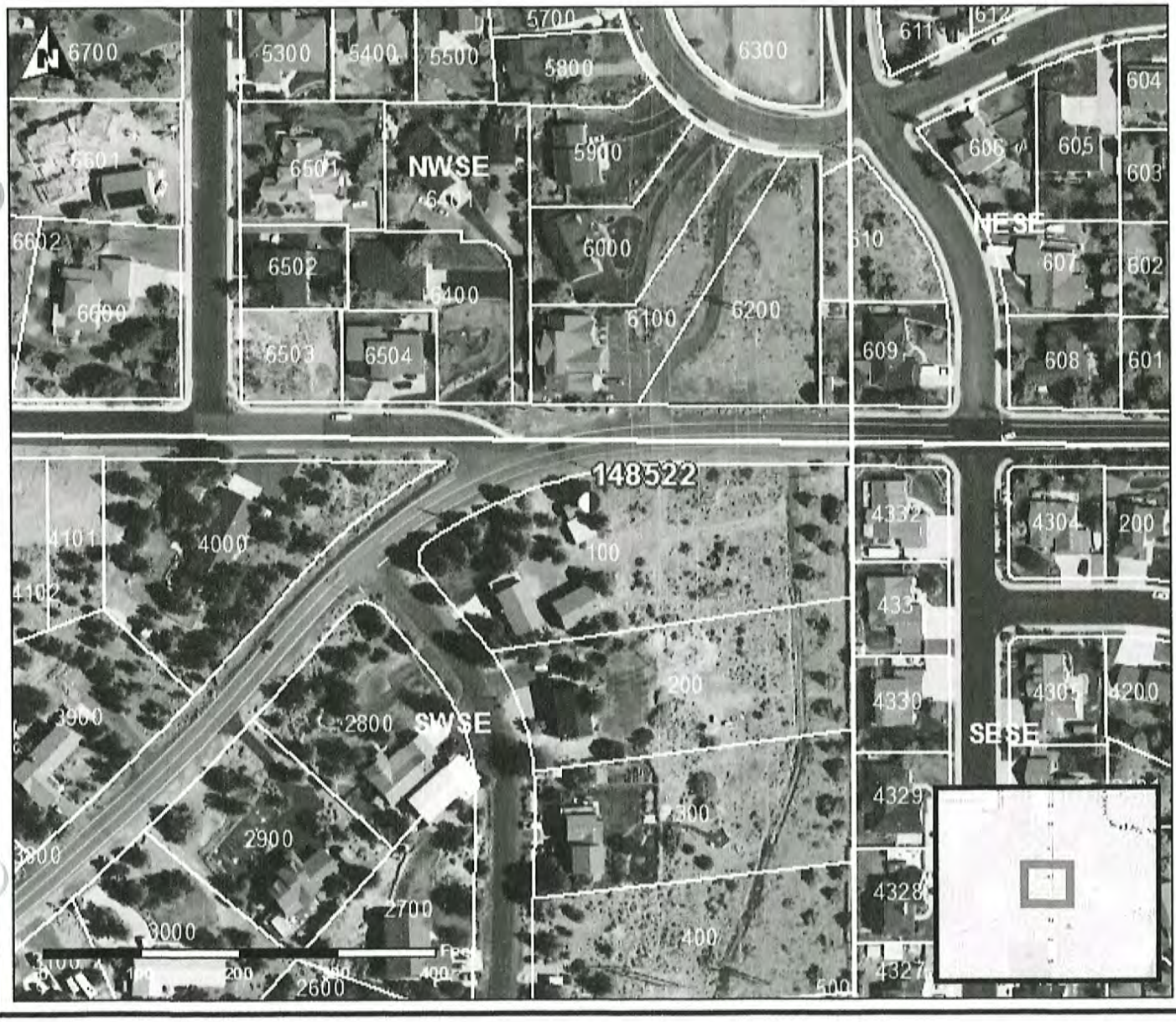
Latitude: 44.25090256 Datum: WGS84
Longitude: -121.21544428
Township/Range/Section/Quarter-Quarter Section:
WM15.00S13.00E19SWSE
Address of Well:
2650 SW BENTWOOD DR DESC

Well Label: 148522

Printed: August 27, 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



Appendix F.

Soil Test Results

Northwest Agricultural Consultants

2545 W Falls Avenue
Kennewick, WA 99336
509.783.7450
www.nwag.com
lab@nwag.com

PAP-Accredited
NAPT

Elkhorn Consulting LLC
14833 Goodrich Creek Lane
Baker City, OR 97814

Report: 70967-1-1
Date: November 12, 2024
Project No: 2024039
Project Name: Sweet (4047 Wickiup Ct)

Sample ID	Sand	Silt	Clay	Texture Class
TP 1 @ 5-10"	64.0%	32.0%	4.0%	Sandy Loam
TP 2 @ 5-10"	56.0%	38.0%	6.0%	Sandy Loam

Appendix G.

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

Google Maps

475 NE Bellevue Dr, Bend, OR 97701 to 4047 SW Wicklup Ct, Redmond, OR 97756

You can enter notes here

475 NE Bellevue Dr
Bend, OR 97701

Take NE Dalton St to US-20

37 sec (353 ft)

1. Head north toward NE Dalton St

79 ft

2. Turn right toward NE Dalton St

148 ft

3. Turn right onto NE Dalton St

226 ft

Take Hamby Rd, Deschutes Market Rd and US-97 N to SW 61st St

15 min (10.2 mi)

4. Turn left onto US-20

0.7 mi

5. At the traffic circle, take the 3rd exit onto Hamby Rd

2.3 mi

6. Continue onto NE Butler Market Rd

0.5 mi

7. Continue onto Hamehook Rd

1.2 mi

8. At the traffic circle, take the 1st exit onto Deschutes Market Rd

3.6 mi

9. Turn right onto Graystone Ln

0.2 mi

10. Turn left onto Deschutes Pleasant Ridge Rd

0.1 mi

11. Merge onto US-97 N

1.6 mi

Follow SW 61st St to S Canal Blvd

3 min (2.1 mi)

12. Turn left onto SW 61st St

2.1 mi

13. Turn left onto 61st St

289 ft

14. Turn right at the 1st cross street onto S Canal Blvd

1 min (1.1 mi)

Continue on SW 61st St/SW Helmholtz Way. Take SW Wicklup Ave to SW Wicklup Ct in Redmond

5 min (2.6 mi)

15. Turn left onto SW 61st St/SW Helmholtz Way

1.3 mi

16. Turn right onto SW Wicklup Ave

0.4 mi

17. Continue onto SW Reservoir Dr

0.2 mi

18. Turn right onto SW 43rd St

313 ft

19. Turn left onto SW Bentwood Dr

0.1 mi

20. Turn right onto SW 41st St

217 ft

21. Turn left onto SW Wicklup Ct
Destination will be on the left

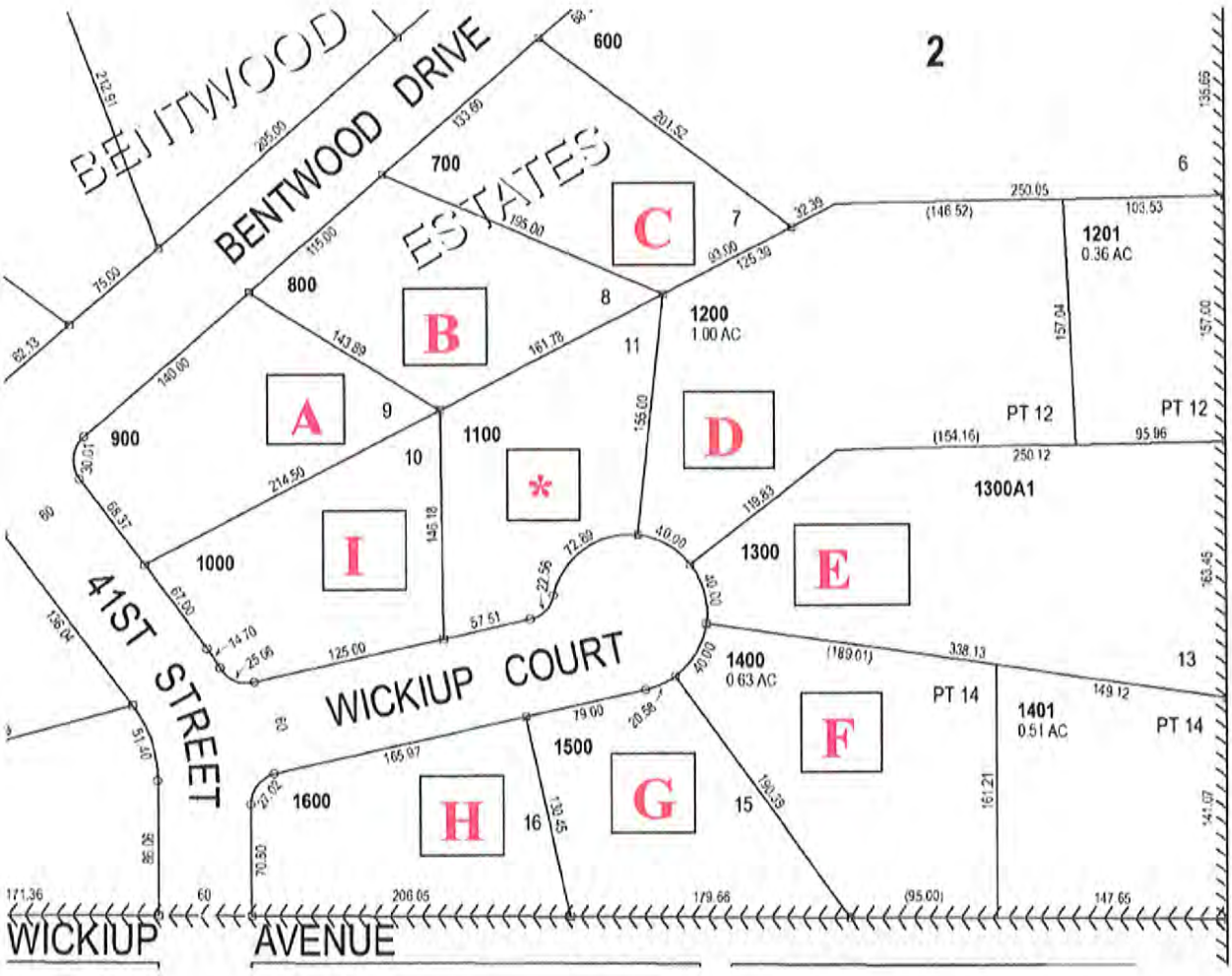
331 ft

4047 SW Wicklup Ct
Redmond, OR 97756

Adjacent Parcels Property Owners

4047 SW Wickiup Court, Redmond, Oregon
(T15S, R13E, Section 19DC, Tax Lot 1100, 0.46 acres

* Tax Lot 1100	SWEET, GREG 750 NE FRONT ST PRAIRIE CITY, OR 97869
A. Tax Lot 900	MARTIN G & LAURIE A STUNKEL REV TRUST 2920 SW BRENTWOOD DR REDMOND, OR 97756
B. Tax Lot 800	WESTENDORF, RONALD A AND LESLIE 2866 SW BRENTWOOD DR REDMOND, OR 97756
C. Tax Lot 700	LUJAN REVOCABLE TRUST 60528 ELKAI WOODS DR BEND, OR 97702
D. Tax Lot 1200	SCHMITT, PATRICK D & PATRICIA J 4005 SW WICKIUP CT REDMOND, OR 97756
E. Tax Lot 1300	DICK & NADINES TRUST 80 SOUTH PLACE LEBANON, OR 97355
F. Tax Lot 1400	SWEARINGEN, GLENN J & LINDA 4022 SW WICKIUP CT REDMOND, OR 97756
G. Tax Lot 1500	ORWICK, MICHAEL G & SILSBEE, DIANA 1604 NW LYNCH AVE TERREBONNE, OR 97760
H. Tax Lot 1600	SAGER FAMILY TRUST ET AL 405 SW WICKIUP CT REDMOND, OR 97756
I. Tax Lot 1000	WHITAKER FAMILY TRUST 2950 SW 41ST ST REDMOND, OR 97756


BENTWOOD
BENTWOOD DRIVE
ESTATES
WICKIUP COURT
41ST STREET
WICKIUP AVENUE
2
600
700
800
900
1000
1100
1200
1.00 AC
1201
0.36 AC
1300
1300A1
1400
0.63 AC
1401
0.51 AC
1500
1600
A
B
C
D
E
F
G
H
I
*
PT 12
PT 14
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7
8
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11
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15
16

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) Sweet, Greg K.

Mailing Address 710 NE Front Street

City, State, Zip Prairie City, OR 97869

Phone (541) 508-8641 Email katiejsweet@gmail.com

Property Information:

County Deschutes

Township, Range, Section, Tax Lot T15S R13E S19DC Tax Lot 1100

Lot and Block Number Lot 11, Block 2 Subdivision Name Bentwood Estates

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.

RECEIVED
JAN 10 2025
DEQ
Eastern Region Bend

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

12/31/2024 — Date

Owner Signature

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.