

Groundwater Application Review Summary Form

Application # G- 18844

GW Reviewer Karl Wozniak Date Review Completed: December 12, 2019

Summary of GW Availability and Injury Review:

[] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[] The well does not appear to meet current well construction standards per Section D of the attached review form. *Route through Well Construction and Compliance Section.*

in review

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO

December 12, 2019

TO: Application G- 18844

FROM: GW: Karl Wozniak
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES
 NO The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

YES
 NO Use the Scenic Waterway Condition (Condition 7J)

Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below

Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date November 26, 2019
 FROM: Groundwater Section Karl Wozniak
Reviewer's Name
 SUBJECT: Application G- 18844 Supersedes review of _____
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525. Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.***

A. GENERAL INFORMATION: Applicant's Name: Larry Lyon County: Polk

A1. Applicant(s) seek(s) 0.111 cfs from 1 well(s) in the Willamette Basin,
Duck Slough subbasin

A2. Proposed use Irrigation Seasonality: March 1 – October 31

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	POLK 54325	1	Alluvial aq system	0.100	9S/4W-3 SW/SE	1500' N, 500' W fr SE cor DLC 40
2						
3						
4						
5						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1												

Use data from application for proposed wells.

A4. **Comments:** The applicant seeks 0.111 cfs (50 gpm) for primary irrigation of 8 acres. The maximum rate the Department allows for irrigation is 1/80th of a cfs/acre which in this case is 0.100 cfs (45 gpm); therefore, this review is based on a rate of 0.100 cfs.

A5. **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water **are**, or **are not**, activated by this application. (Not all basin rules contain such provisions.)

Comments: The well is greater than 1/4 mile from a surface water source so the pertinent basin rules (OAR 690-502-0240) do not apply.

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: _____

Comments: _____

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

- a. is over appropriated, is not over appropriated, or **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. **will not** or **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c. **will not** or **will** likely to be available within the capacity of the groundwater resource; or
- d. **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
- i. The permit should contain condition #(s) 7e_____;
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
- b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
- c. **Condition** to allow groundwater production only from the _____ **alluvial aquifer system** _____ groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

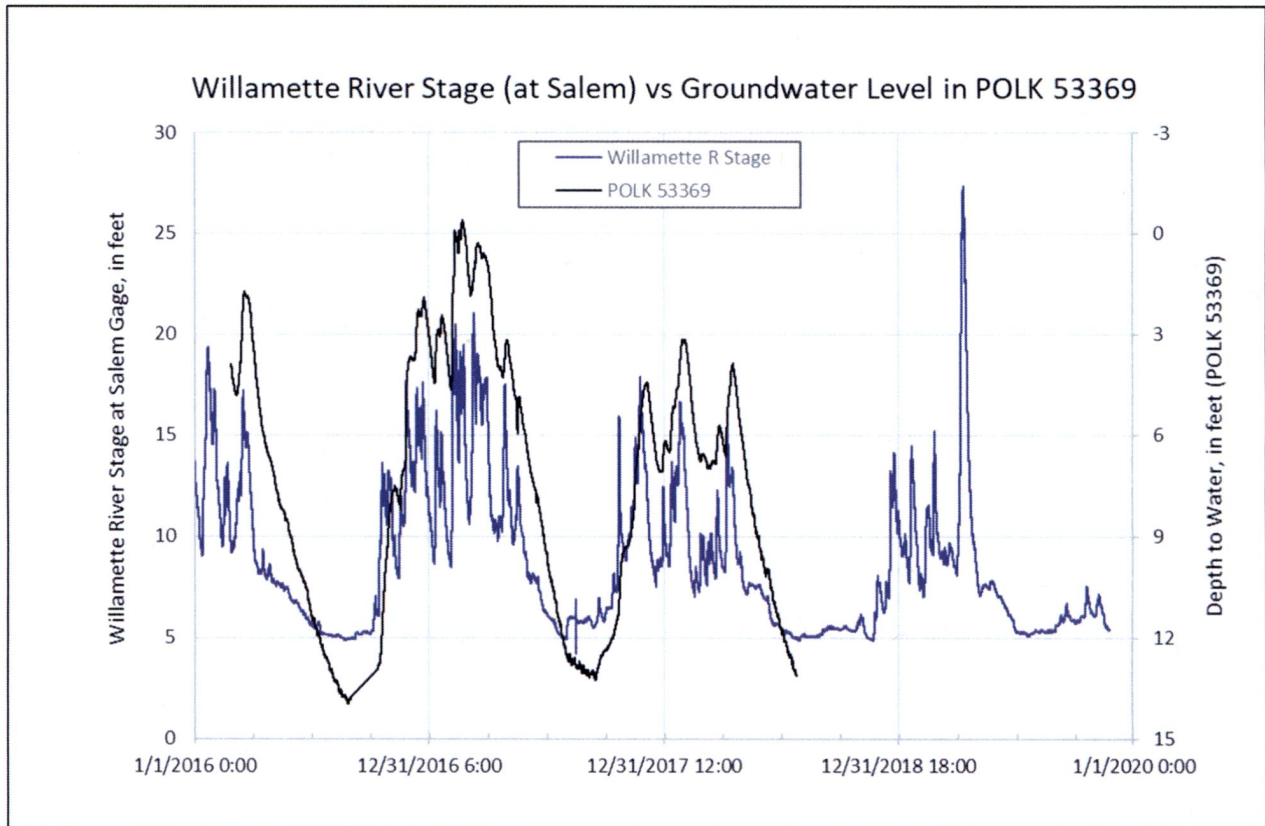
Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

- B3. **Groundwater availability remarks:** The applicant proposes to use 0.1 cfs (45 gpm) for primary irrigation of 8 acres from 1 well, POLK 54325, which produces from unconsolidated sands and gravels in the Holocene floodplain of the Willamette River. The well is located inside a meander loop of the river which is bounded by low-permeability bedrock at the edges of the floodplain. The average saturated thickness of the aquifer in the floodplain is about 30 feet but the water table fluctuates 10-15 feet during the year largely in response to changes in the stage of the Willamette River (see plot below). Water levels in a nearby recorder well (POLK 53369) indicate that seasonal low groundwater levels occur in late August and early September, coincident with the lowest flows in the Willamette River.

The well log for the subject well notes that it a domestic well with 6-inch diameter casing and a reported air test yield of 50 gpm. Similarly constructed wells in the nearby area show a median yield of 30 gpm but yields of 50 gpm are common. Well logs for nearby irrigation and community wells commonly show yields of 500-1000 gpm. Therefore, it seems likely that the well will be able to produce 40-50 gpm.

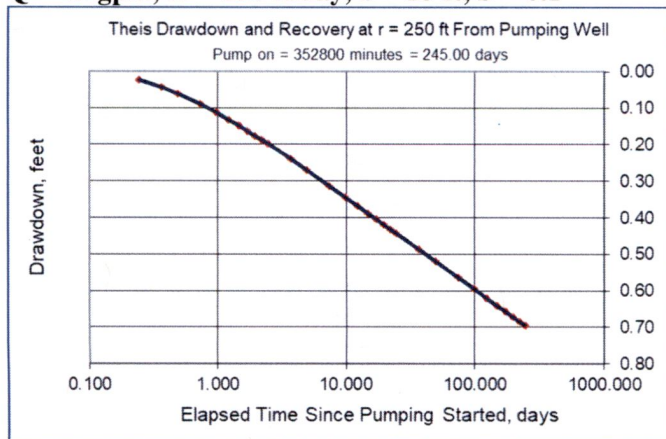
Irrigation well density is relatively high in the surrounding area but the nearest permitted wells are all greater than 1900 feet from the subject well. The Luckiamute Domestic Water Cooperative operates an active well field about 2000 feet to the southwest which contains four high-capacity community wells (POLK 281, 3801, 3802, & 51437); the OWRD water-use reporting database indicates the well field pumped an average of 566 acre feet per year for the water years 2016-2018. The City of Monmouth has a permit (G-12976) that allows the maximum use of 6.0 cfs from 2 community wells in the area just west of the subject well. Only one of these wells, POLK 50392, has been drilled to date at a distance of about 1000 feet to the west. Extensive testing of the well in 2001-2003 indicated substantial interference with the Luckiamute wells to the south and the presence of excessive concentrations of iron and manganese. For these reasons (per information in the associated water right file, G-13521), the city has never put the well into service, no longer plans to place it in service, will not drill the second well (proposed location about 550 feet west of the subject well), and plans to transfer the production right to wells in other locations.

A number of rural residential tax lots are located within 250 feet to ¼ mile of the subject well but the precise location of domestic wells on these lands is unknown. Analytical modeling (see Theis interference plot below) with conservative hydraulic parameters ($K = 250$ ft/day, $S = 0.1$, and $b = 25$ feet) shows a maximum hydraulic interference of about 0.7 feet at a distance of 250 feet after 245 days of continuous pumping at 45 gpm. These results indicate that POLK 54325 is unlikely to cause substantial interference with the nearest domestic wells or with nearby irrigation and community wells. On the other hand, the large combined pumping rates of the community wells and nearby irrigation wells may result in severe interference with the subject well, especially in the late summer months when groundwater levels are low because of low water levels in the Willamette River. Analytical modeling of interference to the subject well from a well pumping 1000 gpm at a distance of 2000 feet (see plot below) indicates about 5 feet of hydraulic interference after 245 days of continuous pumping, again with conservative hydraulic parameters. Actual values for hydraulic conductivity (K) and storativity (S) are expected to be higher which will reduce the predicted impacts. Nevertheless, the impacts of all nearby wells will be additive which indicates the potential to significantly diminish the available water column in the subject well during the late summer months.



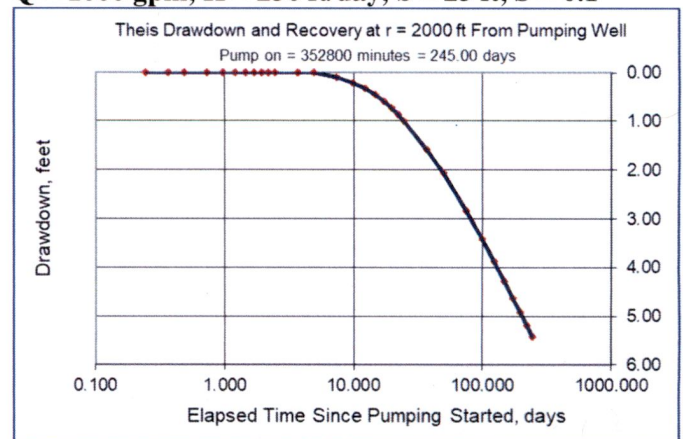
This Interference at 250 feet

$Q = 45$ gpm, $K = 250$ ft/day, $b = 25$ ft, $S = 0.1$



This Interference at 2000 feet

$Q = 1000$ gpm, $K = 250$ ft/day, $b = 25$ ft, $S = 0.1$



C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Alluvial aquifer system	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Although local well logs report static water levels that are slightly higher than the first water-bearing zone, general knowledge indicates that groundwater is essentially unconfined in the Holocene floodplain deposits of the Willamette River. Aquifer tests conducted by the Department indicate specific yields of around 0.2.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Duck Slough	150-165	150-170	490	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Willamette River	150-165	135-140	5800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Porous media are continuous between the subject well and the listed streams. Published water table maps indicate that groundwater flows toward and discharges to the Willamette River. Also, plots of groundwater levels versus stream stage indicate an efficient connection between the aquifer and the Willamette River. Although the well is adjacent to Duck Slough, the slough is shown as an intermittent stream on USGS 7.5-minute topographic maps and is not likely to be hydraulically connected to the aquifer in the summer months but is probably connected in the winter months when groundwater levels are 10-15 feet higher and approach land surface. Since the proposed use is only during the irrigation season, impacts to Duck Slough were not evaluated in tables C3a based on the probable lack of hydraulic connection during the months of proposed use.

Water Availability Basin the well(s) are located within: WILLAMETTE R> COLUMBIA R- AB MILL CR AT GAGE 14191000

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be hydraulically connected and less than 1 mile from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% natural flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: _____

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

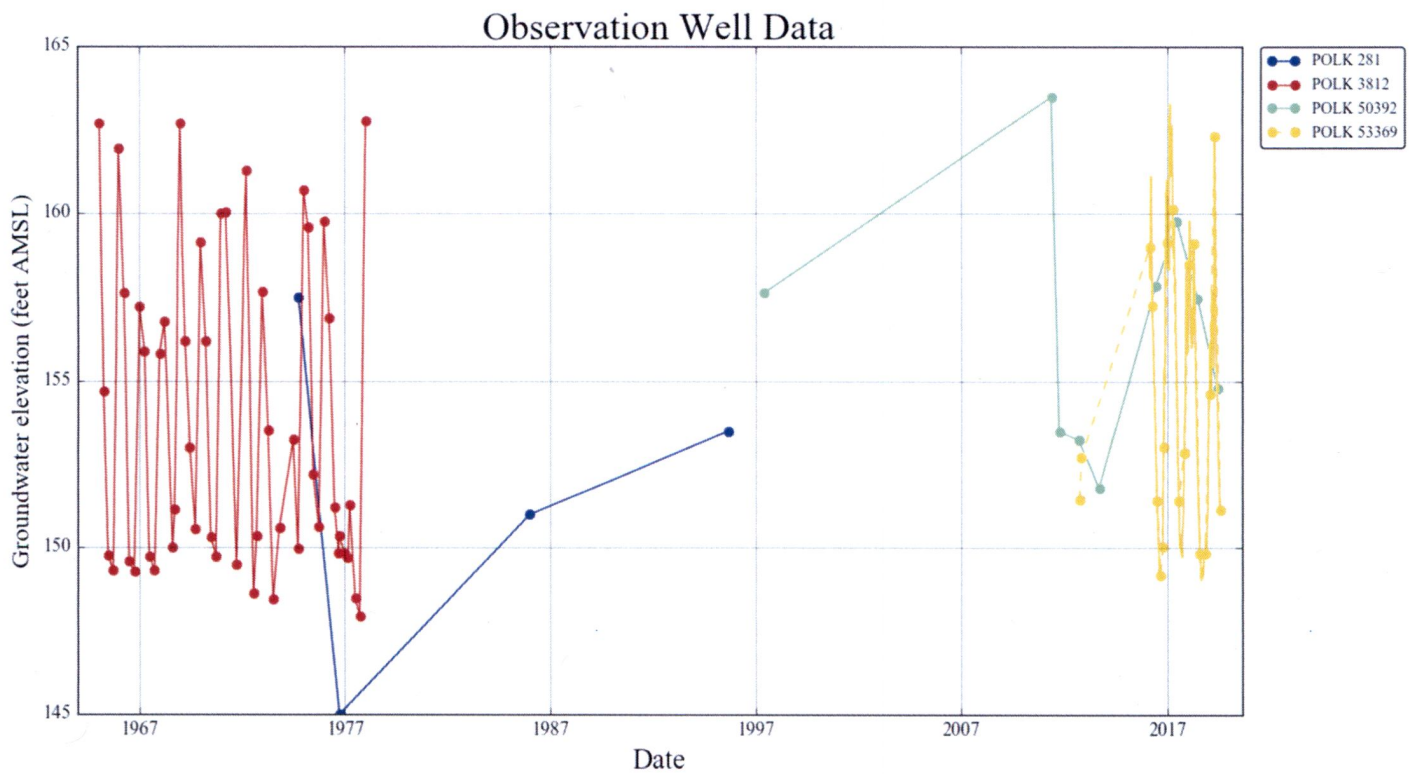
WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191000
 Basin: WILLAMETTE

Watershed ID #: 183
 Time: 1:11 PM

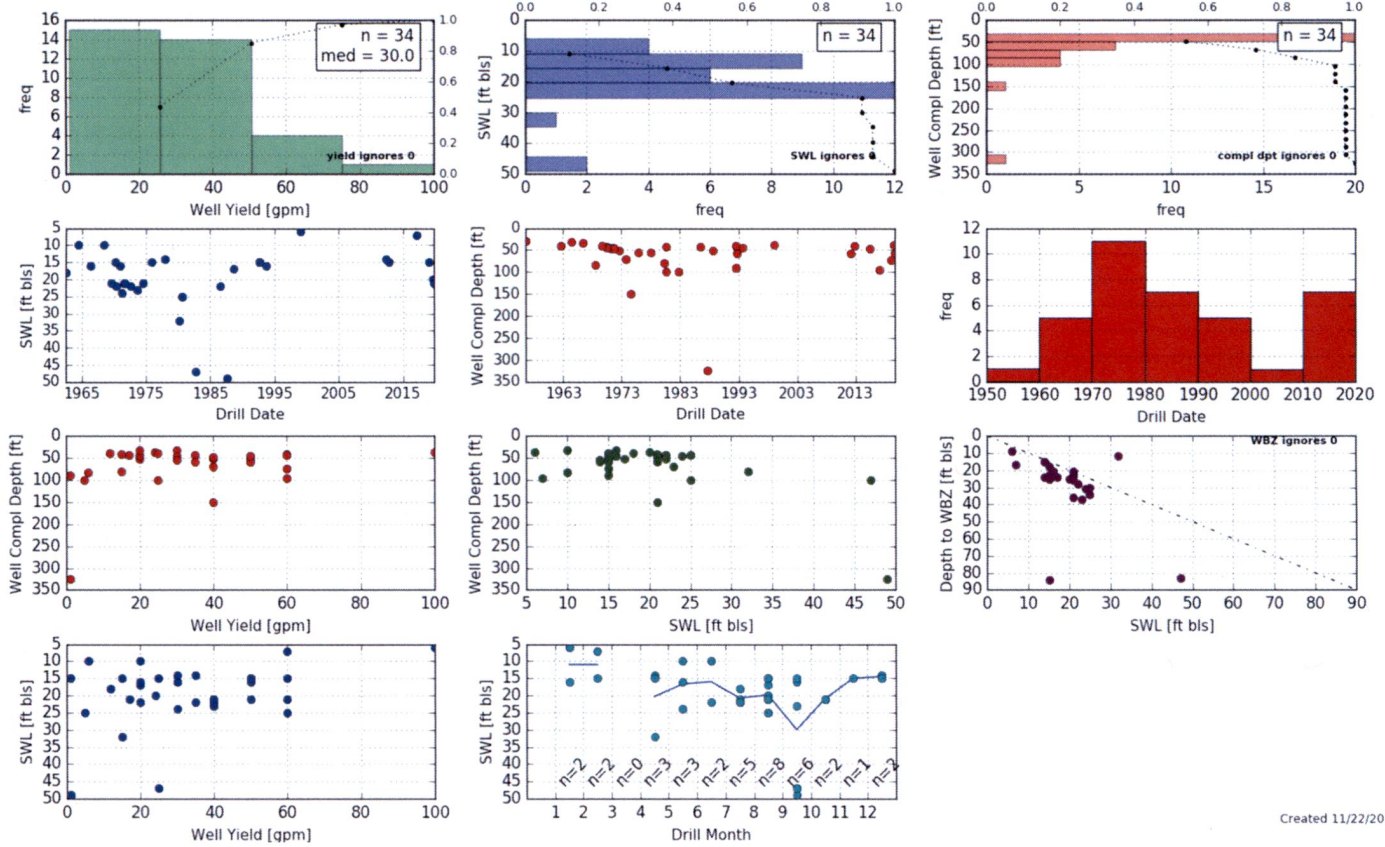
Exceedance Level: 80
 Date: 11/22/2019

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	18,400.00	2,240.00	16,200.00	0.00	1,300.00	14,900.00
FEB	20,100.00	7,430.00	12,700.00	0.00	1,300.00	11,400.00
MAR	19,600.00	7,220.00	12,400.00	0.00	1,300.00	11,100.00
APR	18,000.00	6,870.00	11,100.00	0.00	1,300.00	9,830.00
MAY	15,500.00	4,180.00	11,300.00	0.00	1,300.00	10,000.00
JUN	8,310.00	1,690.00	6,620.00	0.00	1,300.00	5,320.00
JUL	4,710.00	1,450.00	3,260.00	0.00	1,300.00	1,960.00
AUG	3,620.00	1,330.00	2,290.00	0.00	1,300.00	991.00
SEP	3,680.00	1,150.00	2,530.00	0.00	1,300.00	1,230.00
OCT	4,650.00	748.00	3,900.00	0.00	1,300.00	2,600.00
NOV	9,400.00	857.00	8,540.00	0.00	1,300.00	7,240.00
DEC	16,700.00	917.00	15,800.00	0.00	1,300.00	14,500.00
ANN	13,500,000	2,160,000	11,300,000	0	942,000	10,400,000

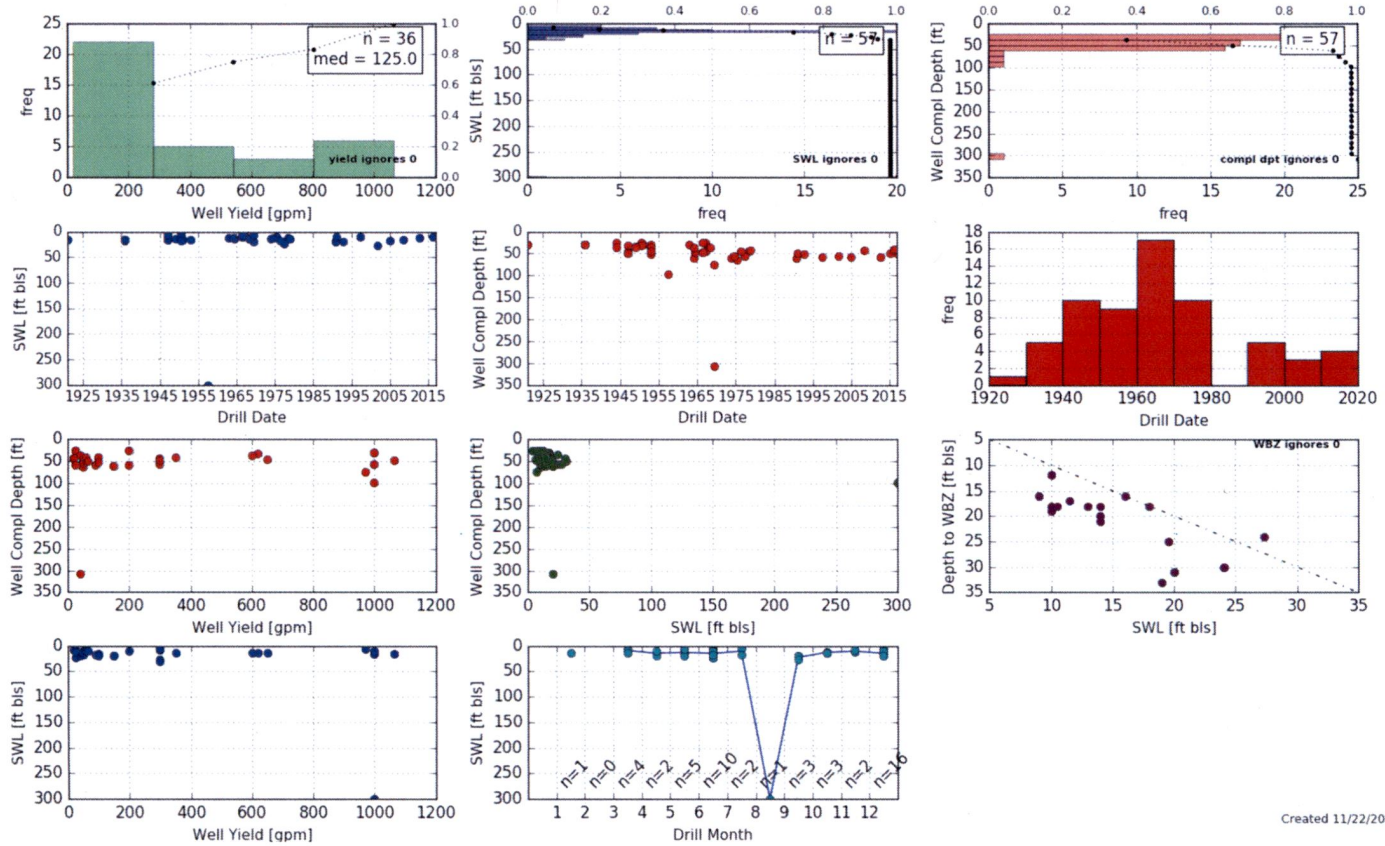
Water-Level Trends in Nearby Wells



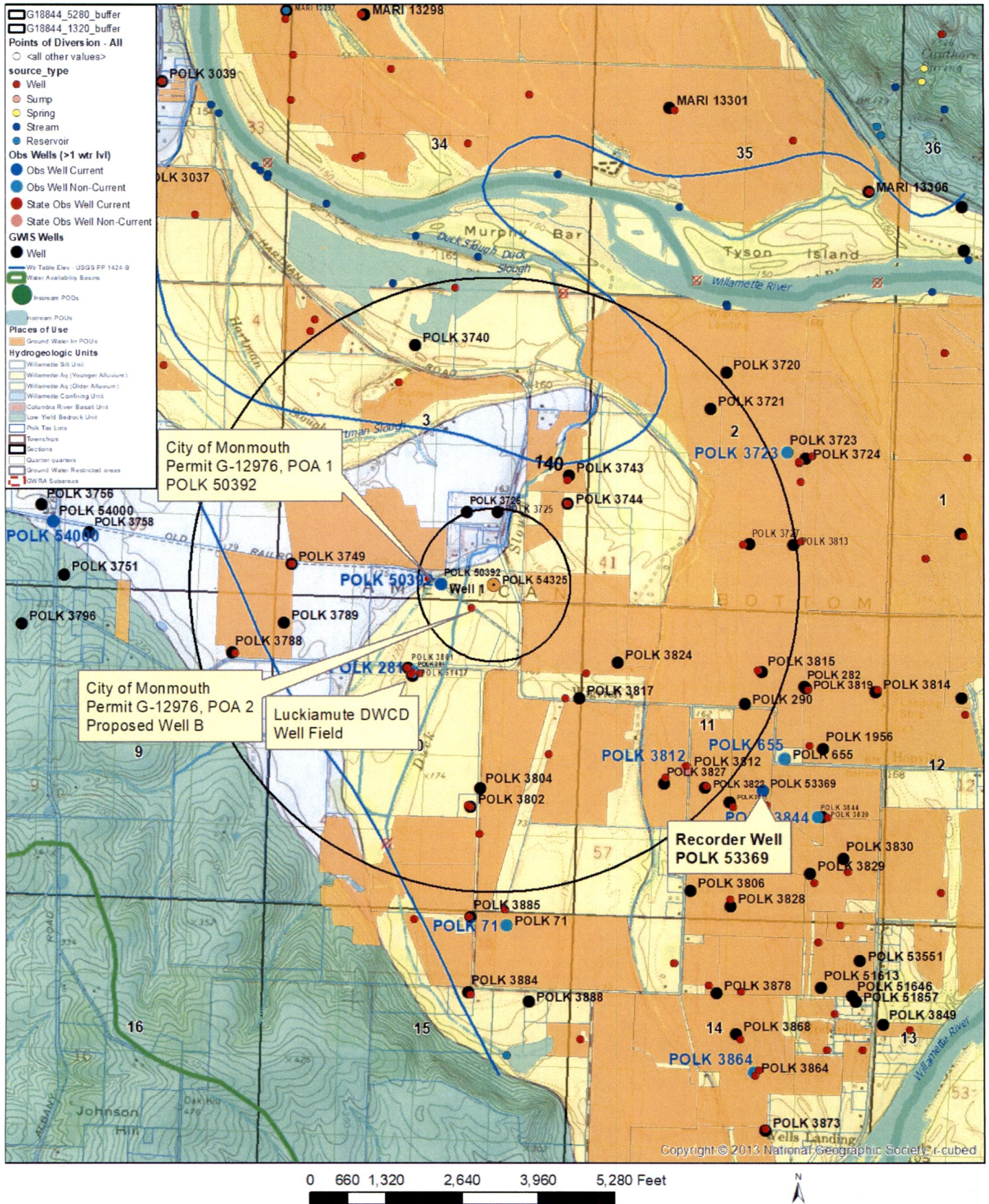
Well Statistics Sections 2, 3, 10, 11, 9S/4W: Domestic Wells (6-inch casing)



Well Statistics Sections 2, 3, 10, 11, 9S/4W: Irrigation & Community Wells (>6-inch casing)



Well Location Map



MEMO

OK.
KJ

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18844
Date: December 17, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Karl Wozniak reviewed the application. Please see Karl's Groundwater Review and the Well Log.

Applicant's Well #1 (POLK 54325): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

The construction of Applicant's Well #1 may not satisfy hydraulic connection issues.

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

POLK 54325
10/14/2019

WELL I.D. LABEL# L 136027
START CARD # 1045083
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name LARRY A Last Name LYON
Company
Address 8455 BUENA VISTA ROAD
City INDEPENDENCE State OR Zip 97351

(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/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [] (Attach copy)
Depth of Completed Well 58.00 ft.

Table with columns: Dia, From, To, Material, SEAL, Amt, sacks/lbs. Rows include Bentonite and Cement with 5% Benton.

How was seal placed: Method [] A [] B [X] C [] D [] E
[X] Other BENTONITE 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
Shoe [X] Inside [] Outside [] Other Location of shoe(s) 58
Temp casing [X] Yes Dia 10 From + 0 To 20

(7) PERFORATIONS/SCREENS
Screens Type Material
Table with columns: Perf, Casing, Screen, Dia, From, To, width, length, # of slots, Tele/pipe size

(8) WELL TESTS: Minimum testing time is 1 hour
[] Pump [] Bailer [X] Air [] Flowing Artesian
Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)
50 42 1

Temperature 53 °F Lab analysis [] Yes By
Water quality concerns? [] Yes (describe below) TDS amount 176 ppm
From To Description Amount Units

(9) LOCATION OF WELL (legal description)
County POLK Twp 9.00 S N/S Range 4.00 W E/W WM
Sec 3 SW 1/4 of the SE 1/4 Tax Lot 200
Tax Map Number Lot
Lat " or 44.81150000 DMS or DD
Long " or -123.15958000 DMS or DD
[] Street address of well [] Nearest address
8455 BUENA VISTA ROAD, INDEPENDENCE, OR 97351

(10) STATIC WATER LEVEL
Date SWL(psi) + SWL(ft)
Existing Well / Pre-Alteration
Completed Well 10/8/2019 21
Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES
Depth water was first found 26.00
SWL Date From To Est Flow SWL(psi) + SWL(ft)
10/8/2019 26 54 50 21

(11) WELL LOG
Ground Elevation
Material From To
Top soil 0 3
Silty brown clay 3 9
Sandy brown clay 9 20
Coarse brown sand 20 26
Brown sand and very small gravel 26 28
Brown sand and large gravel 28 31
Blue gray sand and gravel semi-cemented 31 44
Gray sand and gravel 44 52
Blue clay and gravel 52 54
Blue clay 54 58

Date Started 10/4/2019 Completed 10/8/2019

(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 1903 Date 10/9/2019
Signed RYAN PILLSBURY (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 1273 Date 10/14/2019
Signed FLOYD SIPPEL (E-filed)
Contact Info (optional)