

Groundwater Application Review Summary Form

Application # G- 18650

GW Reviewer Travis Brown and Dennis Orlovski Date Review Completed: 11/20/2018

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.~~

21 11/20/18

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).

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18650
Date: November 26, 2018

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Travis Brown and Dennis Orłowski reviewed the application. Please see Travis's and Dennis's review and the well log.

Applicant's Well #1 (POLK 1286): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 11/20/2018
 FROM: Groundwater Section Travis Brown and Dennis Orłowski
 Reviewer's Name
 SUBJECT: Application G- 18650 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: Willamette Valley Land, LLC County: Polk

A1. Applicant(s) seek(s) 0.014^a cfs from one well(s) in the Willamette Basin,
South Yamhill River subbasin

A2. Proposed use Irrigation (drip) of 71.8 acres Seasonality: Mar 1 – Oct 31 (Irrigation Season)

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 1286	1	Alluvium	0.014 ^a	T6S/R5W-8 SE-SE	820' N, 875' E from SW cor DLC 39 ^b

* 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	187		8.5 ^c	5/24/2016 ^c	29	18	0-29		21-29	10 ^c	~13 ^c	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is located in the South Yamhill River basin near unincorporated Ballston, Oregon, approximately 4 miles southeast of the City of Sheridan.

^a In Section 3 of the Application, the Applicant requested "6.2 gallon per minute" (approximately 0.014 cfs) under "Total maximum rate." However, in the Section 3 table, under "Proposed Use," the Applicant entered "10 gpm" (approximately 0.022 cfs) under the "Well-Specific Rate" for Well 1. This review presumes that the 6.2 gpm (0.014 cfs) is the applicable and requested maximum rate of appropriation, which concurs with Applicant's remarks in Section 10 of the application and Section B of the Land Use Information form.

^b **The written location description provided on the application map appears to be incorrect.** The Applicant provided the written location for Well 1 as "820' N & 875' E FROM SW DLC 38." However, the well location indicated on the Applicant's map instead appears to correspond to a location that is 820 feet north and 875 feet east of the southwest corner of Donation Land Claim 39 (alternatively known as the "Andrew Davidson DLC" in the well log for POLK 1286), based on the location for Well 1 indicated on the Applicant's map, relative to Public Land Survey System (PLSS) section lines, Tax Lots 1100 and 1000, and nearby roadways. **The location of POLK 1286 was resolved as part of the groundwater review conducted for application LL-1685. The corrected location is cited in this review.**

^c Well performance information is summarized from the well test conducted on 5/24/2016 (attached).

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 proposed POA will produce groundwater from a confined aquifer; therefore, the relevant Willamette 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: Not Applicable

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) 7N (annual measurement condition) and medium water-use reporting;
 - 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 _____ 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 Willamette aquifer in the South Yamhill River valley is typically less than 20 feet thick and limited in area (Woodward et al, 1998). The thin sands and gravels of the aquifer are overlain by fine-grained sediments (“Willamette silt”) up to 40 feet thick near the proposed POA/POU (Woodward et al, 1998). Reported yields from nearby wells screened in the unconsolidated sands and gravels range from 0.5 to 20 gallons per minute (gpm), with most reported yields between 5 to 8 gpm (OWRD Well Log Query Report). The unconsolidated sediments are underlain by Eocene marine sedimentary rocks which typically provide low quantities of groundwater of poor quality (high salinity) (Woodward et al., 1998).

Due to the limited resources, groundwater development near the proposed POA/POU has been minimal. No reported groundwater rights were identified within one mile of the proposed POA. The nearest reported groundwater right (Claim No. GR-40) is approximately 1.9 miles from the proposed POA/POU and includes two wells/POAs: YAMH 7794 (Well #1) claimed for 50 gpm (0.1114 cfs) with a priority date of November 3, 1952; and YAMH 7793 (Well #2) claimed for 50 gpm (0.1114 cfs) with a priority date of May 27, 1954. YAMH 7794 reportedly is completed to a depth of approximately 14 feet below land surface (bls), with clay from 0 to 6 ft bls and gravel from 6 to 14 bls. YAMH 7793 reportedly is completed to a depth of approximately 20 feet bls, with clay from 0 to 7 feet bls and gravel from 7 to 20 feet bls. Between 1952 to 1954, both wells were reported with groundwater levels at 3 ft bls – or approximately 3 to 4 feet above the presumed water-bearing unit – indicating that, at the times of completion, the aquifer tapped by both wells appeared to be in a confined condition.

There is at least one exempt domestic well within one mile of the proposed POA, although its exact location is not recorded: POLK 51209 is completed to a depth of 37 feet bls, with clay reported from 3 to 19 feet bls, gravel from 19 to 25 feet bls, and shale from 25 to 37 feet bls. Well reports indicate there may be as many five exempt domestic wells, including POLK 51209, within one mile of the proposed POA; however, well reports for the other four domestic wells do not provide sufficient location information to determine their exact proximity to the proposed POA. Aerial imagery indicates numerous residences within one mile of the proposed POA, primarily associated with the unincorporated community of Ballston. While some of these residences may have associated exempt domestic wells, the generally minimal groundwater development in the area and the fact that all the subject residences are within the service area for the Perrydale Domestic Water Association would suggest that many, if not all, of the nearby residences obtain their water from the Association.

Due to the minimal groundwater use near the proposed POA/POU, the small productive aquifer thickness (20 feet or less), and the low proposed rate of diversion (6.2 gpm or less), the allocation requested in this application should not be expected to injuriously impact either claimed groundwater rights or known exempt well users.

Reported yields from nearby, similar wells indicate that the local alluvial aquifer should be able to support the proposed use and rate. If a new permit is granted, the following conditions are recommended to protect the limited groundwater resource in this area:

- 7N: annual measurement condition
- Medium water-use reporting

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	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Well reports for wells completed near (and including) the proposed POA generally indicate a layer of productive sands and gravels from as shallow as 11 feet bls to as a deep as 52 feet bls, with a median thickness of approximately 6 feet (OWRD Well Log Query Report). These sands and gravels are considered part of the Willamette Aquifer, which the USGS estimates at up to 20 feet thick near the proposed POA/POU (Gannett and Caldwell, 1998). Consistently overlying the Willamette Aquifer in this area is up to approximately 40 feet of silt and clay, referred to as the Willamette Silt, which acts as a confining unit for the underlying sand and gravel aquifer (OWRD Well Log Query Report; Gannett and Caldwell, 1998). Well reports for wells completed in the Willamette Aquifer indicate static water levels as much as 30 feet, but a median 18 feet, above the water-bearing sands and gravels, indicating confined conditions. Measured water levels in four nearby wells, as intermittently reported by the USGS between 1967 and 1996, ranged from 19.5 to 30 feet above the water-bearing sands and gravels, also indicating confined conditions. This concurs with a static water level in POLK1286 measured approximately 15.5 feet above the water-bearing sands and gravels, as part of a pumping test in 2016.

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	Unnamed tributary to S. Yamhill River	~180 ^a	160-155 ^b	3,745	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Unnamed tributary to Salt Creek	~180 ^a	180-170 ^b	7,360	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation:

Hydraulic connection was only determined for nearby perennial streams. Perennial stream designations were determined from United States Geological Survey topographic maps (USGS, 2017).

SW1: The estimated groundwater elevation at Well 1 is up to approximately 25 feet above the range of surface elevations for SW1 in its reach nearest to Well 1. Although the well report for Well 1 noted approximately 20 feet of clay overlying the water-bearing zone, the nearest reach of SW1 may have incised into much of this overlying fine-grained layer, based on its surface elevation relative to that of Well 1 (approximately 187 feet msl). The similarity of the estimated groundwater and surface water elevations is sufficient to assume some degree of hydraulic connection.

SW2: The estimated groundwater elevation at Well 1 is up to approximately 10 feet above the range of surface elevations for SW2 in its reach nearest to Well 1. Although the well report for Well 1 noted approximately 20 feet of clay overlying the water-bearing zone, the nearest reach of SW2 may have incised into much of this overlying fine-grained layer, based on its surface elevation relative to that of Well 1 (approximately 187 feet msl). The similarity of the estimated groundwater and surface water elevations is sufficient to assume some degree of hydraulic connection.

^aGroundwater elevation in Well 1 estimated from depth to static water level reported in a 2016 pumping test for Well 1 (copied from review for application LL-1685 and attached) and estimated land surface elevation at Well 1.

^bSurface water elevation estimated from land surface elevations along stream reaches indicated in the Well Location Map (attached).

Water Availability Basin the well(s) are located within: SW1: S YAMHILL R > YAMHILL R - AB COZINE CR
SW2: SALT CR > S YAMHILL R - AT MOUTH

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?
1	1	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	40.30	<input type="checkbox"/>	<1%	<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?
N/A	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: C3a: Potential depletion of SW1 (unnamed tributary to the South Yamhill River) was estimated using the Hunt 2003 analytical stream depletion model (Hunt, 2003). Hydraulic parameters used for the model are derived either from regional data or studies of the hydrogeologic regime (OWRD Well Log Query Report; Conlon et al, 2003, 2005; Iverson, 2002; Woodward et al, 1998) or are within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Domenico and Mifflin, 1965). See attached "Stream Depletion Analysis Results (SW1)" for the specific parameters used in the analysis.

The Hunt 2003 analytical model results indicate that depletion of SW1 is anticipated to be less than 1% of the well discharge after 30 days of pumping.

C3b: not applicable.

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
1	2	0 %	0 %	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%
Well Q as CFS				0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014		
Interference CFS				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
N/A	N/A	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
(B) = 80 % Nat. Q		154.00	168.00	143.00	75.10	43.90	27.30	18.30	12.90	9.76	10.00	22.40	107.00
(C) = 1 % Nat. Q		1.54	1.68	1.43	0.751	0.439	0.273	0.183	0.129	0.0976	0.100	0.224	1.07
(D) = (A) > (C)													
(E) = (A / B) x 100		%	%	~0 %	~0 %	~0 %	~0 %	~0 %	~0 %	~0 %	~0 %	~0 %	~0 %

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation:

C4a: Potential depletion of SW2 (Unnamed tributary to Salt Creek) was estimated using Hunt 2003 analytical stream depletion model (Hunt, 2003). Hydraulic parameters used for the model are derived either from regional data or studies of the hydrogeologic regime (OWRD Well Log Query Report; Conlon et al, 2003, 2005; Iverson, 2002; Woodward et al, 1998) or are

within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Domenico and Mifflin, 1965). See attached "Stream Depletion Analysis Results (SW2)" for the specific parameters used in the analysis.

The Hunt 2003 analytical modeling results indicate that depletion of SW1 is expected to be negligible one year after the start of pumping for Well 1 as proposed in the application.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

- C5. **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:
- i. The permit should contain condition #(s) _____;
 - ii. The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

C1 (390-09-040(1)): The proposed POA ("Well 1"), existing well POLK 1286, produces groundwater from a confined alluvial aquifer.

C2 (690-09-0404(2)(3)): Well 1 is determined to be connected to both SW1 (Unnamed tributary to the South Yamhill River) and SW2 (Unnamed tributary to Salt Creek).

C3a (690-09-040(4)): The Hunt 2003 analytical model results indicate that depletion of SW1 is expected to be substantially less than 1% of the well discharge after 30 days of continuous pumping.

C3b (690-09-040(4)): not applicable.

C4a (690-09-040(5)): The Hunt 2003 analytical model results indicate that depletion of SW2 is expected to be negligible within one year of the start of pumping of Well 1 as proposed in the application.

References Used:

Application file: G-18650

Application file: LL-1685

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Conlon, T.D., Lee, K.K., and Risley, J.R., 2003, Heat tracing in streams in the central Willamette Basin, Oregon, in Stonestrom, D.A. and Constantz, Jim, eds., Heat as a tool for studying the movement of groundwater near streams: U.S. Geological Survey Circular 1260, chapter 5, p. 29-34.

Domenico, P.A. and Mifflin, 1965, Water from low-permeability sediments and land subsidence: Water Resource Research, v. 1, no. 4, p. 563-576.

Freeze, R.A. and Cherry, J.A., 1979, *Groundwater*, Prentice Hall, Englewood Cliffs, New Jersey, 604 p.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

United States Geological Survey, 2017, *Ballston quadrangle, Oregon* [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

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

Water Availability Analysis Detailed Reports

S WAMHILL R - WAMHILL R AB COZINE CR
WILLAMETTE BASIN

Water Availability as of 11/14/2018

Watershed ID # 162 (MIG)
Date: 11/14/2018

Exceedance Level: 80%
Time: 8:53 AM

Water Availability Calculation | Water Rights | Consumptive Uses and Storage | Watershed Characteristics | Reservoirs

Water Availability Calculation

Monthly Shortfall in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre Feet

Month	Normal Stream Flow (cfs)	Consumptive Uses and Storage (cfs)	Reservoir Storage (cfs)	Stream Flow Requirement (cfs)	Net Water Available (cfs)
JAN	1,475.00	1,440.00	0.00	15.00	1,430.00
FEB	20.10	1,240.00	0.00	15.00	1,220.00
MAR	1,260.00	740.00	0.00	15.00	714.00
APR	15.10	740.00	0.00	15.00	714.00
MAY	171.00	127.00	0.00	15.00	129.00
JUN	41.20	127.00	0.00	15.00	12.00
JUL	79.00	12.30	0.00	15.00	-2.65
AUG	47.70	4.95	0.00	15.00	-32.00
SEP	19.00	4.95	0.00	15.00	-28.00
OCT	51.00	44.00	0.00	15.00	-8.00
NOV	363.00	348.00	0.00	15.00	33.00
DEC	1,270.00	1,190.00	0.00	15.00	1,180.00
ANN	847,000.00	821,000.00	0.00	18,000.00	814,000.00

Water Availability Analysis Detailed Reports

SALT CR - S WAMHILL R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 11/14/2018

Watershed ID # 27562 (MIG)
Date: 11/14/2018

Exceedance Level: 80%
Time: 8:50 AM

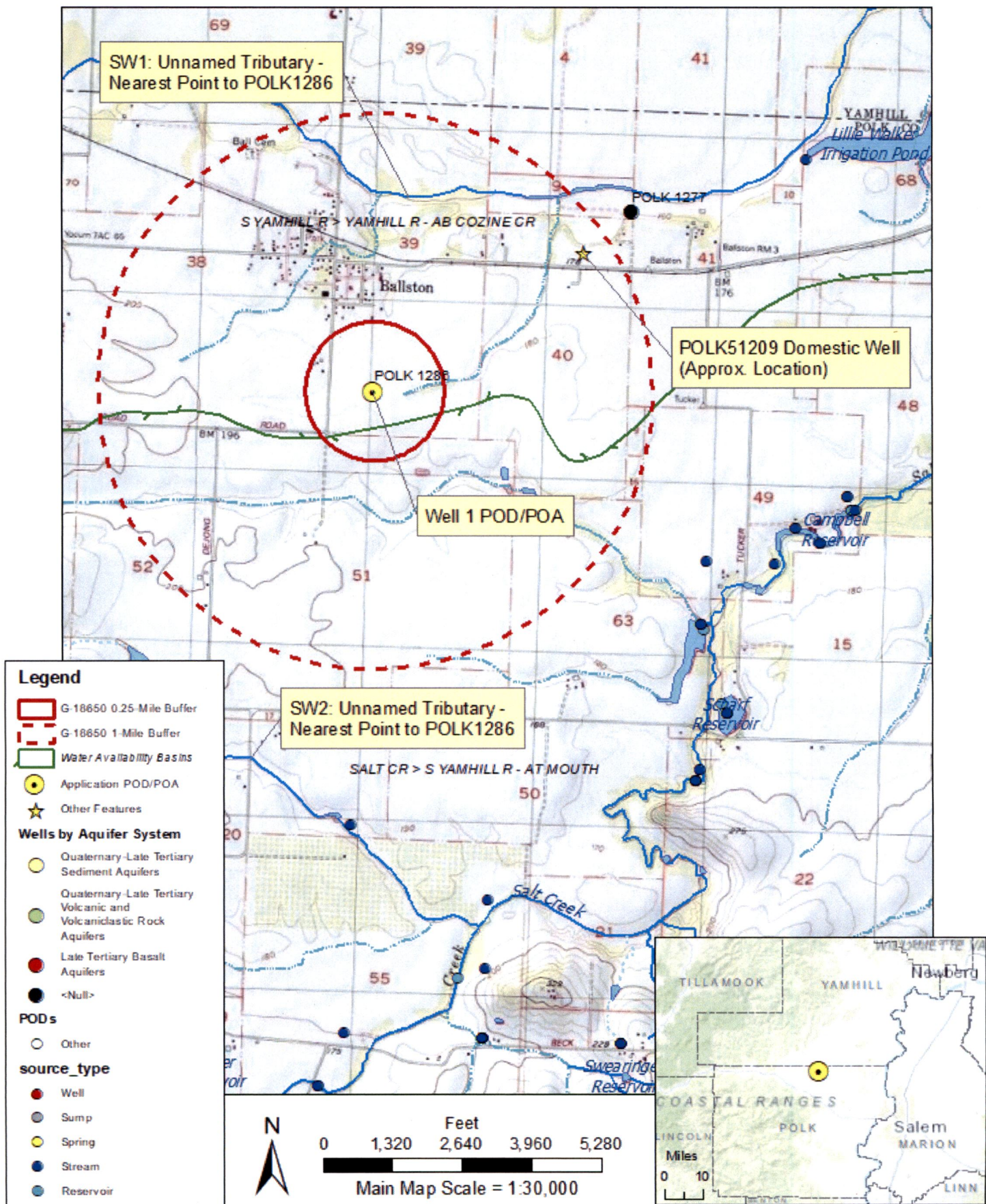
Water Availability Calculation | Water Rights | Consumptive Uses and Storage | Watershed Characteristics | Reservoirs

Water Availability Calculation

Monthly Shortfall in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre Feet

Month	Normal Stream Flow (cfs)	Consumptive Uses and Storage (cfs)	Reservoir Storage (cfs)	Stream Flow Requirement (cfs)	Net Water Available (cfs)
JAN	154.00	11.40	0.00	3.40	137.00
FEB	168.00	15.20	0.00	3.40	130.00
MAR	147.00	17.70	0.00	3.40	126.00
APR	71.10	1.00	0.00	3.40	67.00
MAY	43.90	6.94	0.00	3.40	36.00
JUN	27.30	14.60	0.00	3.40	12.90
JUL	13.00	11.80	0.00	3.40	0.13
AUG	19.00	11.80	0.00	3.40	6.00
SEP	1.76	7.14	0.00	3.40	-2.29
OCT	13.00	1.18	0.00	3.40	8.44
NOV	254.00	4.38	0.00	3.40	246.00
DEC	820.00	8.020.00	0.00	3.40	810.00
ANN	97,000.00	86,000.00	0.00	290.00	84,000.00

G-18650 Willamette Valley Land, LLC



Stream Depletion Analysis Results (SW1)

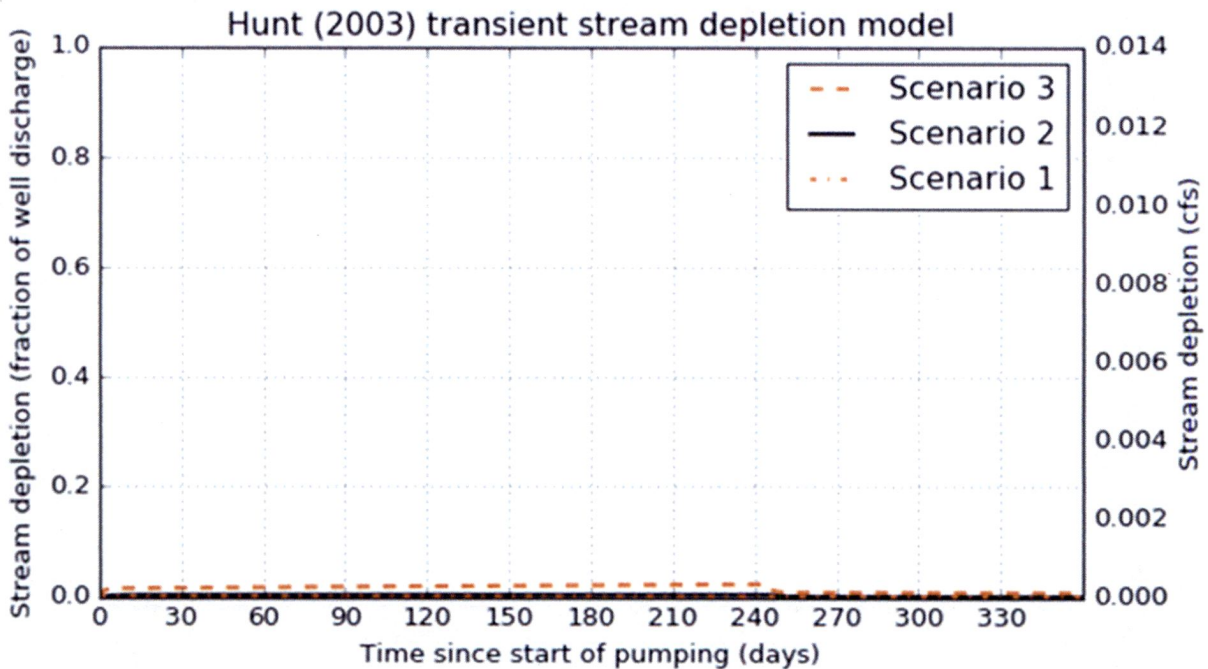
76 PyHunt stream depletion analysis tool

Application type:	G
Application number:	18650
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.014
Pumping duration (days):	245.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3746.0	3746.0	3746.0	ft
Aquifer transmissivity	T	200	2000.0	20000	ft ² /day
Aquifer storativity	S	0.005	0.001	0.0005	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	4	21.0	43	ft
Aquitard thickness below stream	babs	6	3	1	ft
Aquitard specific yield	Sya	0.33	0.2	0.06	-
Stream width	ws	10	10	10	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Stream Depletion Analysis Results (SW2)

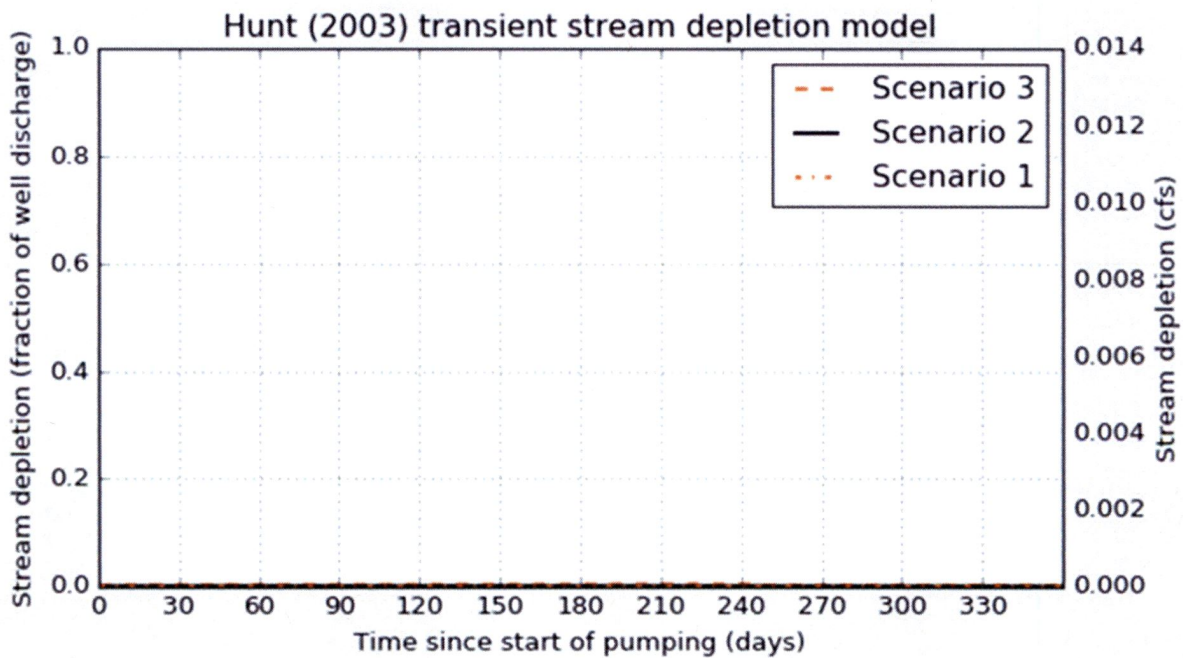
76 PyHunt stream depletion analysis tool

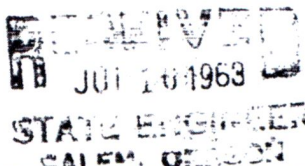
Application type:	G
Application number:	18650
Well number:	1
Stream Number:	2
Pumping rate (cfs):	0.014
Pumping duration (days):	245.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	7361.0	7361.0	7361.0	ft
Aquifer transmissivity	T	200.0	2000.0	20000.0	ft ² /day
Aquifer storativity	S	0.005	0.001	0.0005	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	4.0	21.0	43.0	ft
Aquitard thickness below stream	babs	15.0	10.0	5.0	ft
Aquitard specific yield	Sya	0.33	0.2	0.06	-
Stream width	ws	10	10	10	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00





WATER WELL REPORT
STATE OF OREGON

POLK
1286 State Well No. 6/5W-8
State Permit No. _____

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

(1) OWNER:

Name Clyde Smith
Address Rt 1
Amity, Oregon

(2) LOCATION OF WELL:

County Polk Owner's number, if any—
1/4 Section T. 6S R. 5W W.M.
Bearing and distance from section or subdivision corner
Located at the Andrew Davidson Land Claim

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
andonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) TYPE OF WELL:

Rotary Driven
Cable Jetted
Dug Bored

(6) CASING INSTALLED:

Threaded Welded
6" Diam. from 0 ft. to 29 ft. Gage .250
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

(7) PERFORATIONS:

Perforated? Yes No
Type of perforator used Torch
SIZE of perforations 1/8 in. by 12 in.
perforations from 21 ft. to 29 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

(8) SCREENS:

Well screen installed Yes No
Manufacturer's Name _____
Type _____ Model No. _____
Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(9) CONSTRUCTION:

Was well gravel packed? Yes No Size of gravel: 3/8 Pea
Gravel placed from 18 ft. to 29 ft.
Was a surface seal provided? Yes No To what depth? 18 ft.
Material used in seal— Cement
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(10) WATER LEVELS:

Static level 3 ft. below land surface Date 6/25/63
Artesian pressure _____ lbs. per square inch Date _____

Log Accepted by: _____

[Signed] Clyde Smith Date 6/25, 1963
owner

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? Myself
Yield: 15 gal./min. with 20 ft. drawdown after 4 hrs.
" " " " "
" " " " "
" " " " "
" " " " "
" " " " "
" " " " "
" " " " "
" " " " "
" " " " "
Bailer test gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(12) WELL LOG:

Diameter of well 6 inches.
Depth drilled 29 ft. Depth of completed well 30 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	2
Yellow Clay	2	14
Blue Clay	14	24
Coarse Gravel	24	29

Work started 6/21/63 19____ Completed 6/25/63 19____

(13) PUMP:

Manufacturer's Name _____
Type: _____ H.P. _____

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Ted Schueler Well Drilling
(Person, firm, or corporation) (Type or print)
Address Rt 3 Box 283 Dundee, Oregon

Driller's well number _____
[Signed] Ted Schueler
(Well Driller)
License No. 184 Date June 25, 1963

