

Groundwater Application Review Summary Form

Application # G- 18975

GW Reviewer Jen Woody Date Review Completed: 11/25/2020

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.

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

November 25, 2020

TO: Application G- 18975

FROM: GW: Jen Woody
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

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

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

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 11/25/2020
 FROM: Groundwater Section Jen Woody
 Reviewer's Name
 SUBJECT: Application G- 18975 Supersedes review of 6/25/2020
 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: Leon and Terri Eichler County: Yamhill

- A1. Applicant(s) seek(s) 0.45 cfs up to 293.75 acre-feet from 1 well(s) in the Willamette Basin, South Yamhill River subbasin
- A2. Proposed use Irrigation of 117.5 acres 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
<u>1</u>	<u>Proposed</u>	<u>POA3</u>	<u>alluvial</u>	<u>0.45</u>	<u>5S/4W-19 SW ¼ NW ¼</u>	<u>1830' S, 270' E fr NW cor S 19</u>

* 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	160		20*		100	0-20						

Use data from application for proposed wells.

- A4. **Comments:** *The well is not yet drilled. Water level elevation estimated from nearby well logs YAMH 7033, YAMH 7035, alluvial wells with construction similar to that proposed for this project.
Highlighted text indicate application amendments that triggered this re-review.

- 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 will produce from a confined aquifer so the pertinent rules (OAR 690-502-0240) do not apply.

- A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: n/a
 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, Large 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 alluvial 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 proposed wells will access an alluvial aquifer composed of sand and gravel beds that occur at depths of 50-90 feet, located on the terrace between Salt Creek and the South Yamhill River. Aquifer thickness ranges from 10-40 feet. The aquifer is overlain by a confining layer, the Willamette Silt, which is saturated to within 5-10 feet of land surface. The alluvial aquifer is underlain by older bedrock which has low permeability and porosity.

There are 19 well logs in Sections 18 and 19, T5S/R4W, including both domestic and irrigation wells. Reported well yields range from 0-200 gpm, with a median yield of 30 gpm (see Figure 5). The total requested rate of 0.45 cfs (202 gpm) is at the high end of reported nearby well yields. The limited thickness of the aquifer may prevent obtaining the requested rate.

There is an irrigation POA located 1320 feet west-northwest from proposed well 3 and an exempt well 1100 feet Northwest of proposed well 3. The proposed use is not expected to prevent nearby senior groundwater rights from accessing their usual pumping rates, based on Theis drawdown estimates (see Figure 6).

There are few nearby wells with time series groundwater level data available (see Figure 3). **The limited capacity of the aquifer and the proposed rate indicate that water-level and water-use measurement and reporting conditions (item B1d) above) should be included if a permit is issued by the Department.**

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	<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"/>

Basis for aquifer confinement evaluation: Approximately 40 feet of Willamette Silt overlies the target aquifer and act as a confining unit. _____

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	Salt Creek	130-140	120-140	7000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	South Yamhill River	130-140	110-120	5300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Published water table maps show that groundwater flows toward and discharges into the listed streams (Conlon, 2005).

Water Availability Basin the well(s) are located within: Watershed ID #: 73562: Salt Creek<S Yamhill River-at mouth; Watershed ID # 162: S Yamhill R> Yamhill R-AB Cozine CR will also be affected.

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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?

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: Salt Creek and the South Yamhill River are located greater than 1 mile from the proposed POA, so this section does not apply.

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	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		0	0	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0	0
Interference CFS		0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.001	0.001
(A) = Total Interf.		0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.001	0.001
(B) = 80 % Nat. Q		1290	1470	1260	764	378	171	79	47.7	40.30	53.80	363	1220
(C) = 1 % Nat. Q		12.90	14.70	12.60	7.64	3.78	1.71	0.79	0.477	0.403	0.538	3.63	12.20
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		0.00078 %	0.00068 %	0.000248 %	0.000393 %	0.000794 %	0.00175 %	0.0038 %	0.00629 %	0.0074 %	0.00743 %	0.000275 %	0.000082 %

(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) = highli4ht the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		0	0	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0	0
Interference CFS		0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.001	0.001
(A) = Total Interf.		0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.001	0.001
(B) = 80 % Nat. Q		154	168	143	75.1	43.90	27.3	18.3	12.9	9.76	10	22.4	107
(C) = 1 % Nat. Q		1.54	1.68	1.43	7.51	4.39	0.273	0.183	0.129	0.097	0.10	0.224	1.07
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		0.000649 %	0.000595 %	0.00140 %	0.00266 %	0.00683 %	0.0110 %	0.0164 %	0.0233 %	0.0307 %	0.03 %	0.00446 %	0.000935 %

Basis for impact evaluation: The POA is located just outside one mile from both nearby creeks. It is still hydraulically connected to these creeks, but Division 9 rules about the allowable degree of interference at distances greater than one mile do not reference water availability basin natural flows or instream flows.

In actuality, the volume of annual use would exceed the water right's total allowable duty in less than an irrigation season if pumped at the maximum rate continuously. The modeling in this section is therefore the worst-case scenario. Stream depletion impacts to Salt Creek and the South Yamhill River are estimated as less than 0.02% of 80% exceedance every month of the year. The distance between the proposed well and nearby creeks, combined with the overlying low-permeability Willamette Silt limit the degree of stream depletion over a one-year time frame.

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:** While hydraulic connection will exist between the proposed well and nearby creeks, distance between the well and creeks and the presence of approximately 40 feet of Willamette Silt will limit the degree of capture on the timescale of one year. Capture is defined in this context as water produced by a well that would otherwise discharge to nearby surface water bodies. This means water will largely come from storage in the aquifer in the early years of development, and the groundwater level should be measured and reported to monitor for overdraft.

References Used: 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.

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.

OWRD Groundwater information system, accessed 11/17/2020.

Theis, C.V., 1940, The source of water derived from wells: Essential factors controlling the response of an aquifer to development, Civil Eng., Vol. 10: pp. 277-280.

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.**

Figure 1. Water Availability Tables

Water Availability Analysis Detailed Reports

SALT CR > S YAMHILL R - AT MOUTH WILLAMETTE BASIN

Water Availability as of 6/22/2020

Watershed ID #: 73562 ([Map](#))

Exceedance Level:80%

Date: 6/22/2020

Time: 12:07 PM

Water Availability Calculation

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

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	154.00	17.60	137.00	0.00	0.40	136.00
FEB	168.00	15.30	153.00	0.00	0.40	152.00
MAR	143.00	12.80	130.00	0.00	0.40	129.00
APR	75.10	5.25	69.80	0.00	0.40	69.40
MAY	43.90	6.91	37.00	0.00	0.40	36.60
JUN	27.30	14.40	12.90	0.00	0.40	12.50
JUL	18.30	17.80	0.53	0.00	0.40	0.13
AUG	12.90	14.20	-1.29	0.00	0.40	-1.69
SEP	9.76	7.14	2.62	0.00	0.40	2.22
OCT	10.00	1.18	8.84	0.00	0.40	8.44
NOV	22.40	4.30	18.10	0.00	0.40	17.70
DEC	107.00	16.20	90.80	0.00	0.40	90.40
ANN	92,900.00	8,040.00	85,000.00	0.00	290.00	84,700.0

Water Availability Analysis Detailed Reports

S YAMHILL R > YAMHILL R - AB COZINE CR WILLAMETTE BASIN

Water Availability as of 6/23/2020

Watershed ID #: 162 ([Map](#))

Exceedance Level:80%

Date: 6/23/2020

Time: 1:23 PM

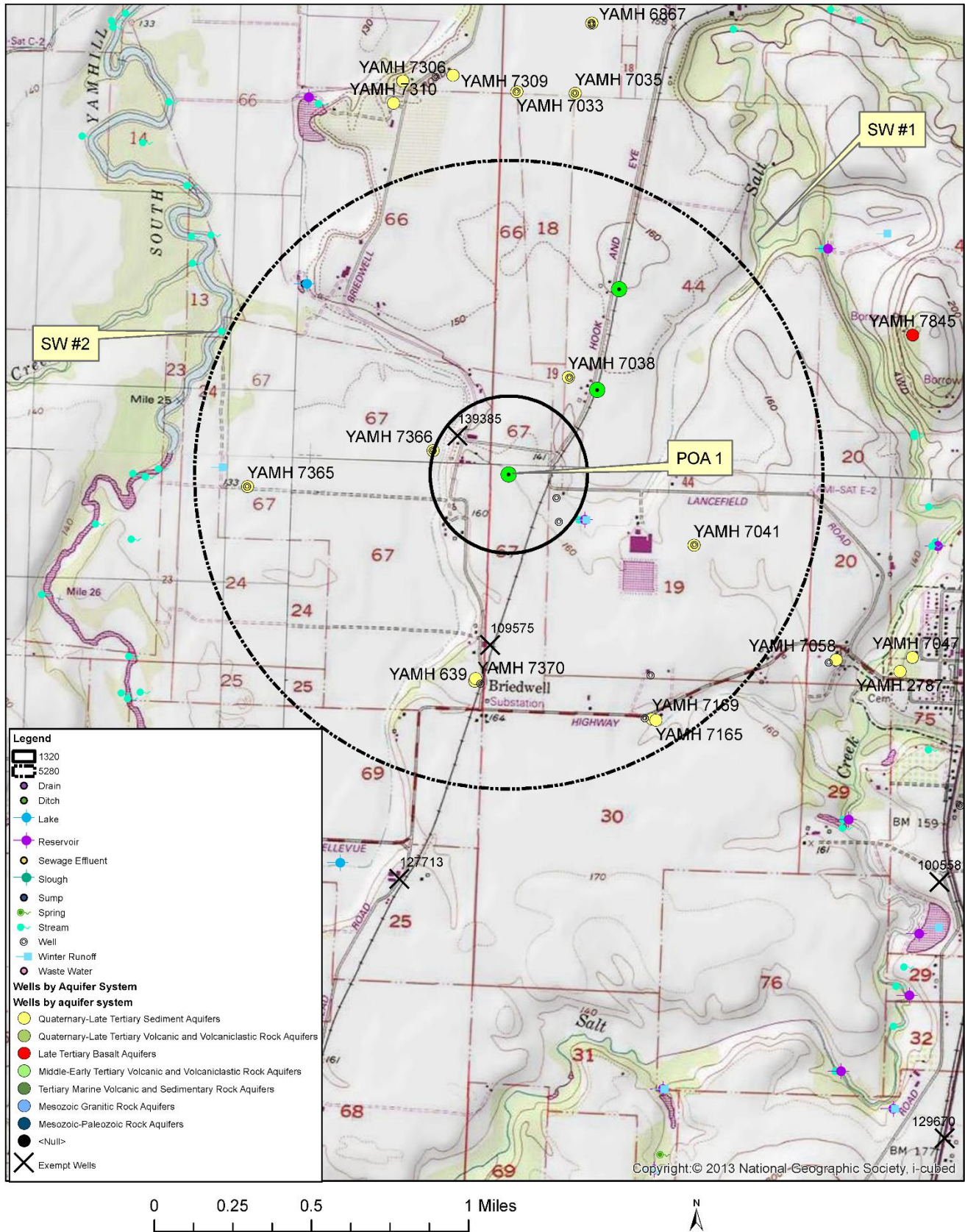
Water Availability Calculation

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

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	1,290.00	30.50	1,260.00	0.00	15.00	1,240.00
FEB	1,470.00	28.60	1,440.00	0.00	15.00	1,430.00
MAR	1,260.00	20.50	1,240.00	0.00	15.00	1,220.00
APR	764.00	15.30	749.00	0.00	15.00	734.00
MAY	378.00	24.90	353.00	0.00	15.00	338.00
JUN	171.00	44.40	127.00	0.00	15.00	112.00
JUL	79.00	66.90	12.10	0.00	15.00	-2.88
AUG	47.70	56.00	-8.27	0.00	15.00	-23.30
SEP	40.30	34.40	5.87	0.00	15.00	-9.13
OCT	53.80	9.60	44.20	0.00	15.00	29.20
NOV	363.00	15.40	348.00	0.00	15.00	333.00
DEC	1,220.00	28.60	1,190.00	0.00	15.00	1,180.00
ANN	847,000.00	22,700.00	825,000.00	0.00	10,900.00	814,000.00

Figure 2. Well Location Map

G 18975 Eichler T5S/R4W-Sections 18 & 19



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Figure 3. Water-Level Trends in Nearby Wells

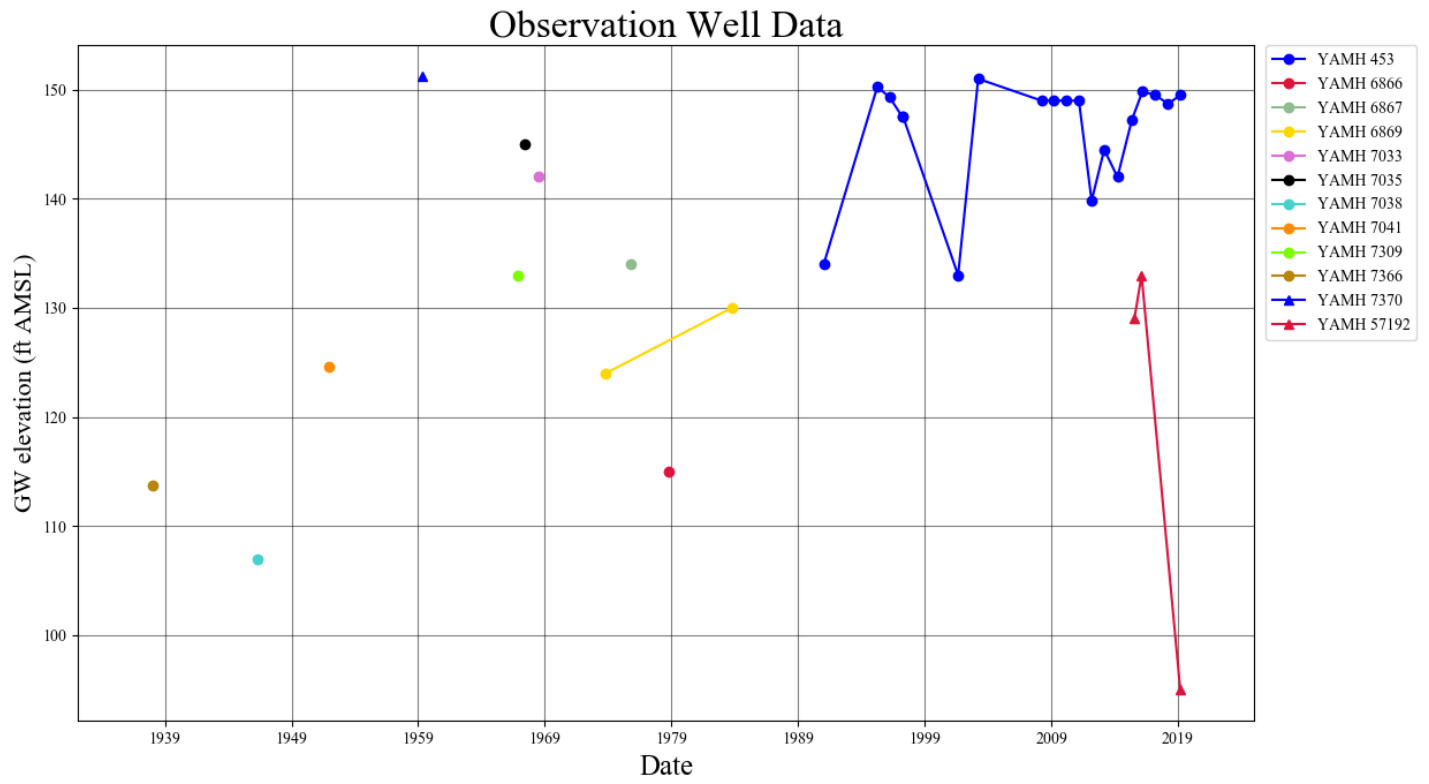


Figure 4. Stream Depletion

Application type:	G
Application number:	18975
Well number:	1
Stream Number:	1
Pumping rate (cfs):	1.47
Pumping duration (days):	244.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2500	2500	2500	ft
Aquifer transmissivity	T	3000	6000	12000	ft ² /day
Aquifer storativity	S	0.0001	0.0001	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	50	50	50	ft
Aquitard thickness below stream	babs	10	10	10	ft
Aquitard specific yield	Sya	0.1	0.1	0.1	-
Stream width	ws	40	40	40	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	1	0	0	1	1	1	1	1	1	1	1	0	0
Depletion (cfs)	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00

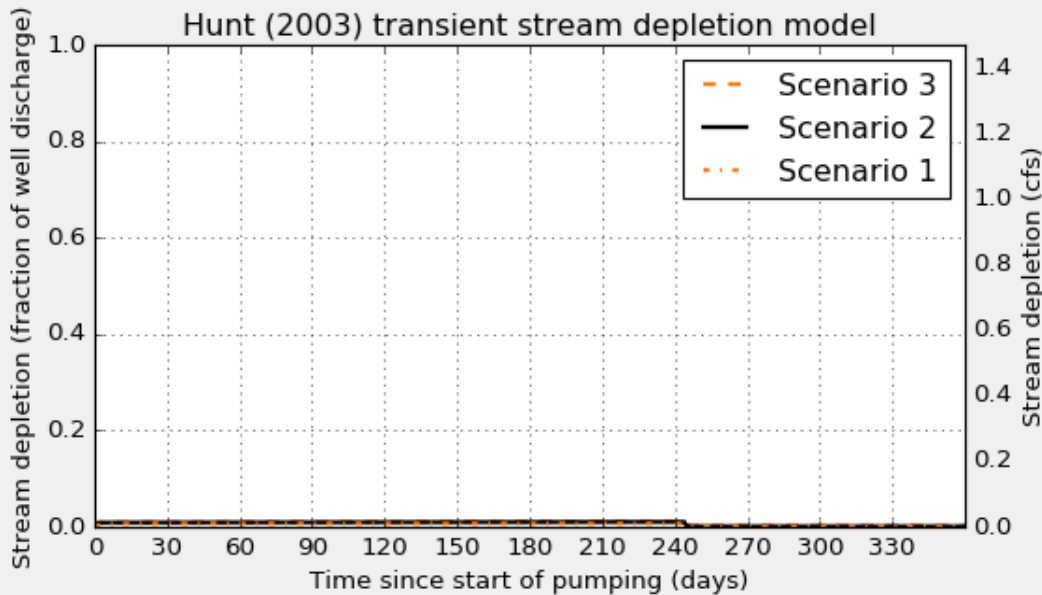
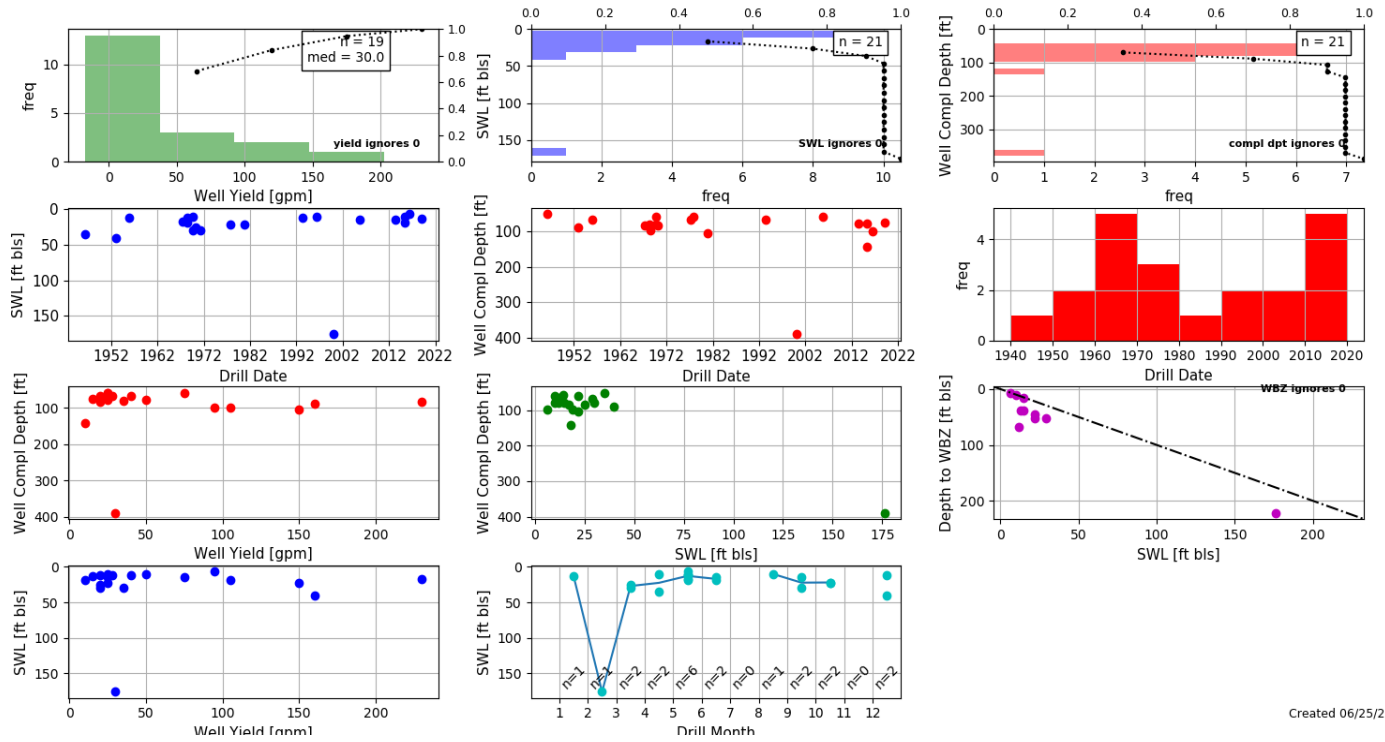
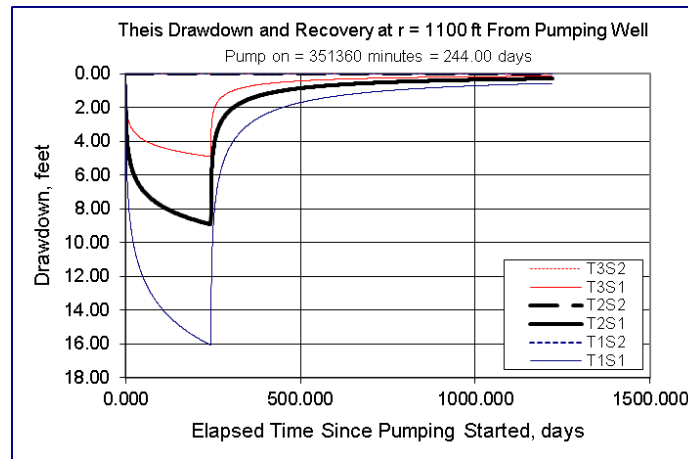


Figure 5 Well Log Statistics for T5S/R4W-Sections 18 & 19



Created 06/25/2020

Figure 6. Drawdown at 1100 feet from the proposed POA, after 244 days of pumping.



Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units
Total pumping time	t		244		d
Radial distance from pumped well:	r		1100		ft
Pumping rate	Q		200		gpm
Hydraulic conductivity	K	60	120	240	ft/day
Aquifer thickness	b		20		ft
Storativity	S_1		0.001		
	S_2				
Transmissivity Conversions	T_f2pd	1200	2400	4800	ft ² /day
	T_ft2pm	0.8333333	1.6666667	3.3333333	ft ² /min
	T_gpdpft	8976	17952	35904	gpd/ft