Groundwater Application Review Summary Form

Application # G- _19276_

GW Reviewer _Gabriela Ferreira / Dennis Orlowski_ Date Review Completed: _March 30, 2023_

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 **_March 30, 2023_**

TO: **Application** G-**_19276_**

FROM: **GW:** **_Gabriela Ferreira / Dennis Orlowski_**
(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 _[Enter]_ 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 March 30, 2023
FROM: Groundwater Section Gabriela Ferreira / Dennis Orlowski
Reviewer's Name
SUBJECT: Application G- **19276** 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: **Vitaly Anfilofieff** County: **Clackamas**

A1. Applicant(s) seek(s) 0.33 cfs from two well(s) in the Willamette Basin, subbasin

A2. Proposed use Irrigation (26.1 acres) Seasonality: March 1 through 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	TBD	Well 1	Alluvial	0.33	4S/1E-27 SW-SW	1290' N, 720' E fr SW cor S 27
2	TBD	Well 2	Alluvial	0.33	4S/1E-27 SW-SW	1290' N, 1090' E fr SW cor S 27

* 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	210	TBD	TBD	TBD	360	0 – 30	0 – 360	TBD	TBD[b]	TBD	TBD	TBD
2	215	TBD	TBD	TBD	360	0 – 30	0 – 360	TBD	TBD[b]	TBD	TBD	TBD

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is approximately 4 miles southeast from the city limits of Aurora, Oregon. Applicant proposes irrigation of 26.1 acres by two wells to be constructed.
[a] Land surface elevation from LIDAR at the proposed well location (OLC, 2016)
[b] The open interval was not specified in the application. This review evaluates the entire potentially open interval, from 30 to 360 feet below land surface (bls).

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 is greater than ¼-mile from the nearest surface water source and will develop a confined aquifer; therefore, per OAR 690-502-0160 the relevant Willamette Basin rules (OAR 690-502-0050) do not apply.

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: **N/A**
Comments: **N/A**

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) **7c, Static Water Level Condition**;

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 POA is located in the central Willamette Valley and will produce from water-bearing sand and gravel layers within the Willamette Aquifer and the Willamette Confining Unit. The Willamette Aquifer in this area is estimated to be ~60 ft thick and is covered by ~20-30 ft of silt (the Willamette Silt); the underlying Willamette Confining Unit is estimated to range from 800-900 feet thick (Gannett and Caldwell, 1998). The majority of wells in the immediate vicinity draw water from the Willamette Aquifer or upper Willamette Confining unit down to ~150 ft depth (see attached well statistics).

Within approximately one mile of the proposed POA locations there are about 25 water rights, typically for irrigation and nursery use, with wells completed in the alluvial aquifer system and several more exempt (domestic) wells also likely in the area. Reported maximum yields in the nearby alluvial wells range up to ~800 gpm but are more typically on the order of 20-200 gpm. Well deepenings are not prevalent. The requested rate (0.33 cfs) is within the range of reported yields for water wells in this area.

The nearest groundwater user was identified as CLAC 12545, located approximately 800 feet southeast of the proposed POAs. CLAC 12545 is a permitted irrigation well (deepened under CLAC 1483 and altered under CLAC 12542) completed to a depth of 315 feet bls and sealed to 18 feet bls. Despite not fully penetrating the alluvial aquifer system, potential impacts on CLAC 12545 were modeled using the attached Theis drawdown analysis and assuming the full duty and rate of the proposed POAs. Transmissivity values are based on pump tests from nearby alluvial wells. At the lowest observed transmissivity (approximately 600 ft^2/day), drawdown is less than 20 feet. It appears unlikely that interference in excess of

the typical permit condition limits (Condition 7c) would occur at CLAC 12545 as a result of the requested withdrawal.

Seven wells with sufficient water level data for evaluation were identified within approximately 1.5 miles of the POA, ranging in total depth from 165 to 422 feet bls. Reported water level elevations for these wells are highly variable, ranging from about 120 feet above mean sea level (amsl) to 200 feet amsl; this broad range is likely due to the corresponding wide range of well completion depths. Because the open interval depth is not known for the proposed POAs, water level data across all of these depth ranges were evaluated. Water level data for these wells are generally stable over the time period available (~mid-1990's through present) although some variability up to 20 feet is observed. Approximately 12 feet of decline is observed in water levels from one well (CLAC 63505) from 2016 – 2022 although the time period coincides with drought conditions and is not long enough to be conclusive.

The stable groundwater conditions indicate that the proposed use is within the capacity of the resource. However, in order to monitor and protect the resource and other groundwater rights in the area, the recommended permit conditions should be included.

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**	☒	☐
2	**Alluvial**	☒	☐

Basis for aquifer confinement evaluation: Nearby wells completed in the Willamette Aquifer or Willamette Confining Unit report SWLs above the water-bearing zone(s), indicating a confined aquifer or series of aquifers. The Willamette Aquifer is overlain by approximately 30 feet of silt (Willamette Silt).

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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Creamery Creek**	**165 - 175[a]**	**180 - 215**	**1,530**	☒	☐	☐	☐	☒
2	**1**	**Creamery Creek**	**165 - 175**	**180 - 215**	**1,480**	☒	☐	☐	☐	☒
1	**2**	**Wheeler Creek**	**165 - 175**	**145 - 210**	**1,450**	☒	☐	☐	☐	☒
2	**2**	**Wheeler Creek**	**165 - 175**	**145 - 210**	**1,560**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: [a] The application did not specify an open interval. The groundwater elevation is based on water levels from nearby wells with similar construction as the proposed POAs (CLAC 20198, CLAC 12545) and published groundwater elevations (Gannett and Caldwell, 1998).

Because the estimated groundwater elevations for the proposed POAs are coincident with or slightly above the elevations of SW1 and SW2 within one mile of the POAs, the aquifer system proposed to be accessed by the POA is efficiently hydraulically connected to those stream reaches.

The depletion of local streams by proposed Well 1 and Well 2 will be attenuated, but not eliminated, by the low vertical hydraulic conductivity (permeability) of the Willamette Silt and other clays and silts that lie between the deeper sands and gravels and the stream beds. Net impacts will be relatively small at the onset of pumping, but will increase with time until a new equilibrium between local recharge and discharge is reached. At that time depletion is expected to be relatively constant throughout the year.

Water Availability Basin the well(s) are located within:
SW1: Molalla River > Willamette River - at mouth (WID 69796)
SW2: Pudding River > Molalla River – above Mill Creek (WID 151)

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?
1	**1**	☐	☐	**IS69796A**	**100.00**	☐	**134.00**	☐	**<25%**	☐
2	**1**	☐	☐	**IS69796A**	**100.00**	☐	**134.00**	☐	**<25%**	☐
1	**2**	☐	☐	**IS73532B**	**36.00**	☐	**67.30**	☐	**<25%**	☐

2	**2**	☐	☐	**IS73532B**	**36.00**	☐	**67.30**	☐	**<25%**	☐

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?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: C3a: The Hunt 2003 analytical stream depletion model was used to estimate 30-day interference at SW2 (Wheeler Creek) caused by pumping Well 1 to estimate the maximum anticipated interference, based on proximity and similar hydrologic conditions. Model results indicate that interference is expected to be much less than 25% of the maximum allocated pumping rate at 30 days. The model was not applied to the other scenarios because they are farther from respective streams, and thus, given a similar hydrogeologic setting, the estimated 30-day stream depletion percentages would be even less than that estimated for the Well 1/SW 2 scenario.

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
		%	%	%	%	%	%	%	%	%	%	%	%
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													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(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: _____

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:**

References Used: Application G-19276 and application map

Well reports CLAC 12582, CLAC 20198, CLAC 20346, CLAC 52842, CLAC 57287, CLAC 61258, CLAC 63505

Pumping well reports CLAC 12545, CLAC 12567, CLAC 51664

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, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

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

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, Vol 8, p. 12-19.

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

Oregon Lidar Consortium (OLC), 2016, OLC metro 2014 lidar project, Oregon Department of Geology & Mineral Industries, Portland, OR, November 30.

United States Geological Survey, 2014, National Hydrography Dataset (NHD), 1:24,000, U. S. Department of the Interior, Reston, VA.

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:** _____

_____

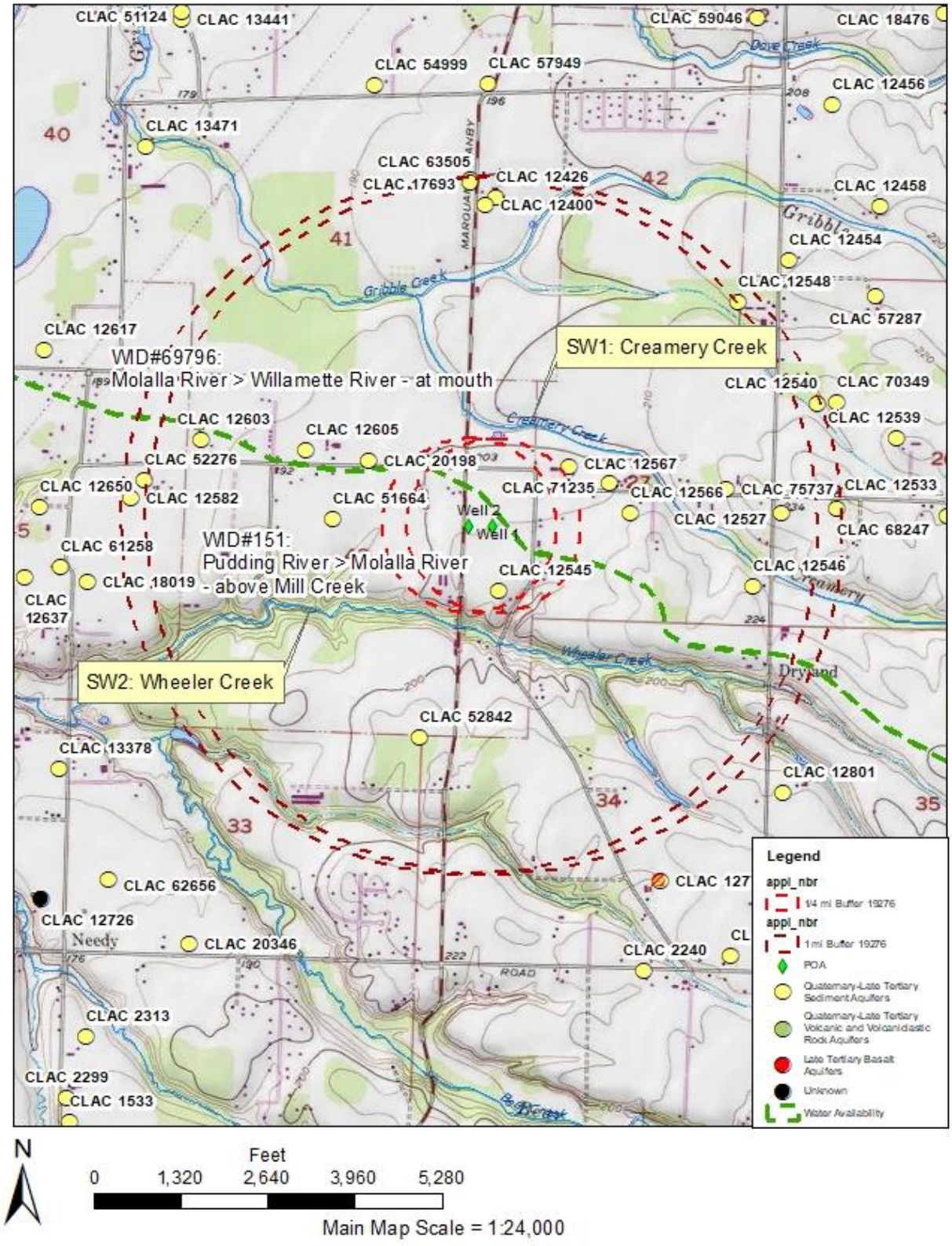
_____

_____

_____

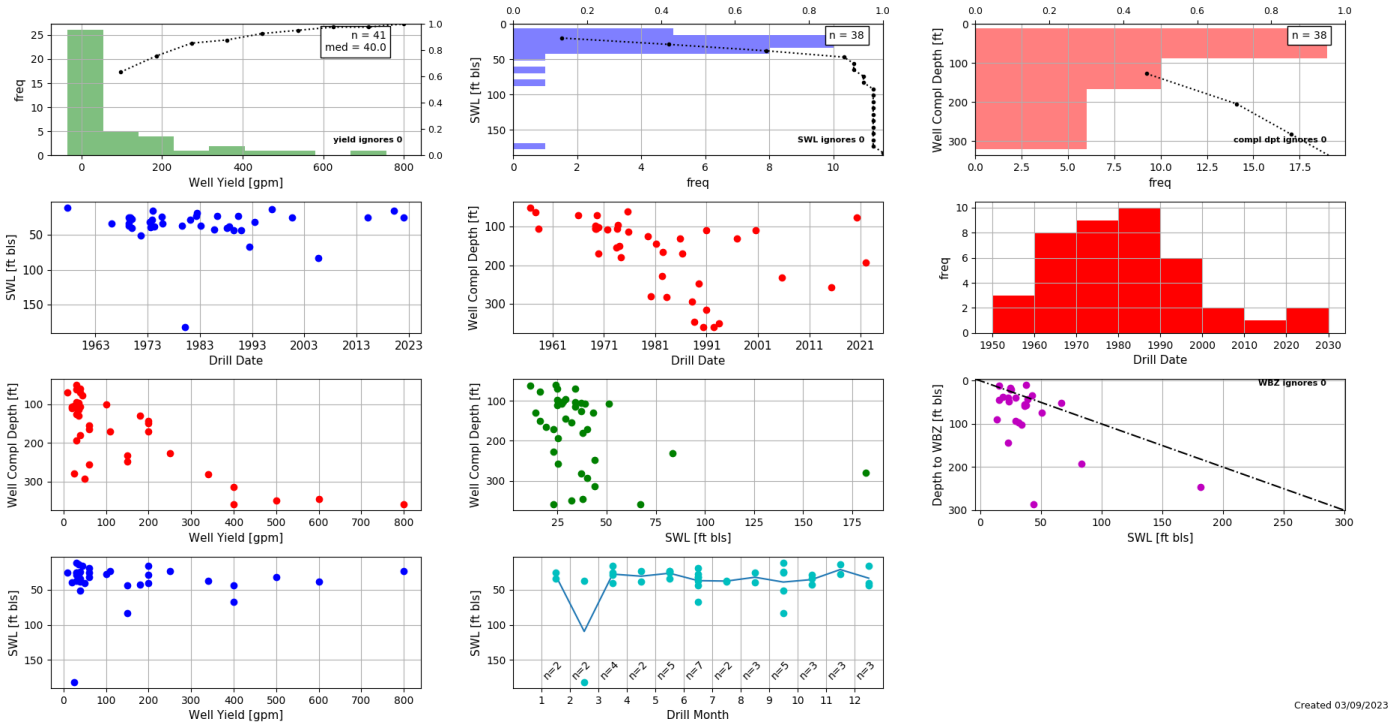
D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Application G-19276 Anfilofieff
T4S, R1E, Section 27



Service Layer Credits: Copyright© 2013 National Geographic Society, i-cubed

Well Statistics



Water Availability Tables

Water Availability Analysis
Detailed Reports

MOLALLA R > WILLAMETTE R - AT MOUTH
WILLAMETTE BASIN
Water Availability as of 3/17/2023

Watershed ID #: 69796 (Map)
Date: 3/17/2023

Exceedance Level: 80%
Time: 3:04 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations
Water Rights | Watershed Characteristics

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	1,870.00	155.00	1,720.00	0.00	500.00	1,220.00
FEB	2,010.00	145.00	1,870.00	0.00	500.00	1,370.00
MAR	1,830.00	113.00	1,720.00	0.00	500.00	1,220.00
APR	1,530.00	86.90	1,440.00	0.00	500.00	943.00
MAY	927.00	98.40	829.00	0.00	500.00	329.00
JUN	431.00	121.00	310.00	0.00	500.00	-190.00
JUL	204.00	186.00	17.60	0.00	200.00	-182.00
AUG	139.00	157.00	-17.60	0.00	100.00	-118.00
SEP	134.00	83.30	50.70	0.00	150.00	-99.30
OCT	188.00	39.90	148.00	0.00	450.00	-302.00
NOV	637.00	80.00	557.00	0.00	500.00	57.00
DEC	1,700.00	150.00	1,550.00	0.00	500.00	1,050.00
ANN	1,320,000.00	85,500.00	1,240,000.00	0.00	295,000.00	966,000.00

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

Water Availability Analysis
Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN
Water Availability as of 3/17/2023

Watershed ID #: 151 (Map)
Date: 3/17/2023

Exceedance Level: 80%
Time: 3:06 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations
Water Rights | Watershed Characteristics

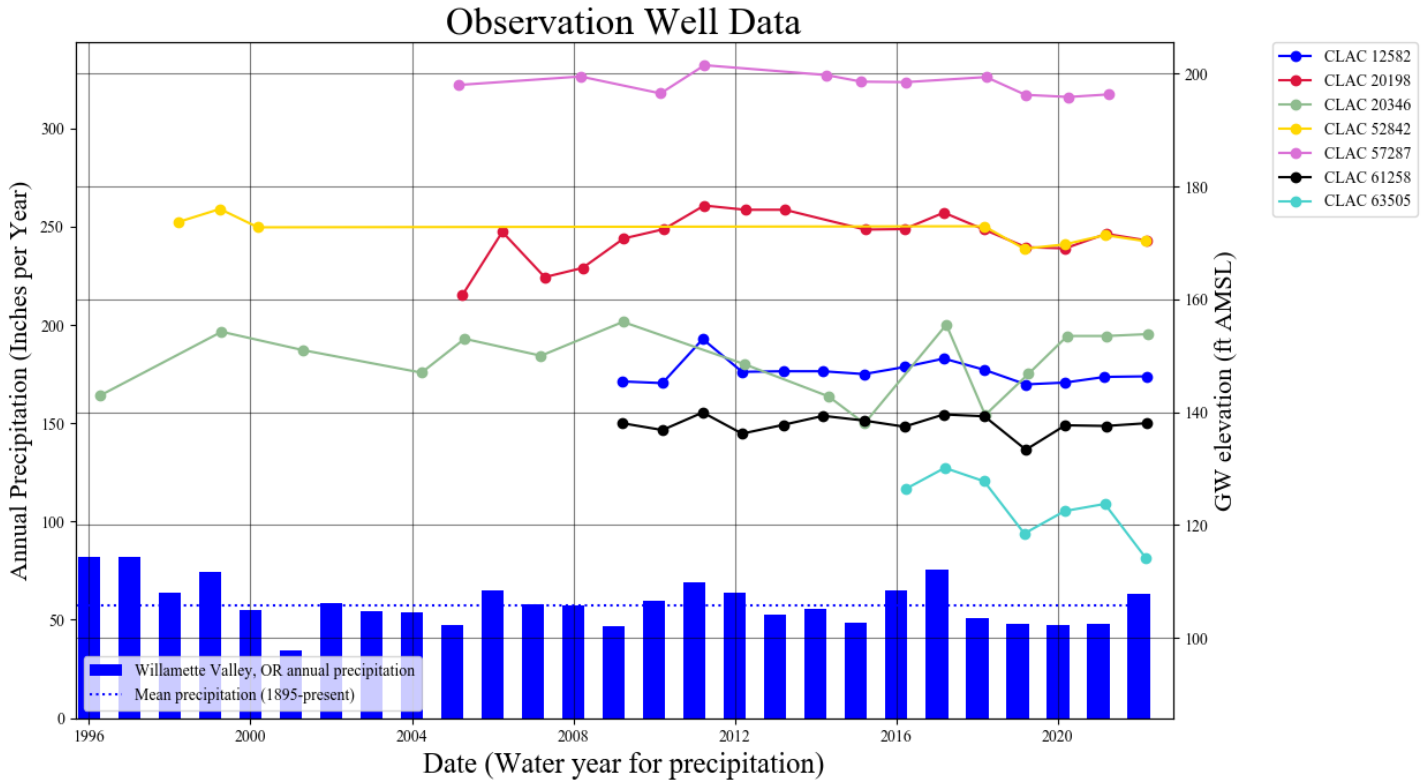
Water Availability Calculation

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	1,040.00	125.00	915.00	0.00	36.00	879.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	76.50	933.00	0.00	36.00	897.00
APR	787.00	52.40	735.00	0.00	36.00	699.00
MAY	425.00	50.90	374.00	0.00	36.00	338.00
JUN	224.00	73.00	151.00	0.00	36.00	115.00
JUL	109.00	115.00	-5.88	0.00	36.00	-41.90
AUG	71.00	94.10	-23.10	0.00	36.00	-59.10
SEP	67.30	53.40	13.90	0.00	36.00	-22.10
OCT	91.60	11.50	80.10	0.00	36.00	44.10
NOV	363.00	48.60	314.00	0.00	36.00	278.00
DEC	957.00	118.00	839.00	0.00	36.00	803.00
ANN	706,000.00	56,300.00	650,000.00	0.00	26,100.00	626,000.00

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

Water-Level Measurements in Nearby Wells



Stream Depletion (Hunt) Model Analysis

Application type:	G
Application number:	19276
Well number:	1
Stream Number:	2
Pumping rate (cfs):	0.33
Pumping duration (days):	240.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1450.0	1450.0	1450.0	ft
Aquifer transmissivity	T	600	850	900	ft2/day
Aquifer storativity	S	0.001	0.001	0.001	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.01	ft/day
Aquitard saturated thickness	ba	7.0	7.0	7.0	ft
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	10.0	15	20	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	4	4	0	1	1	2	2	3	3	4	4	4
Depletion (cfs)	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01