Groundwater Application Review Summary Form

Application # G- _19257_

GW Reviewer _Mitra Khadka/Travis Brown_ Date Review Completed: _05/05/2023_

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 **_May 5, 2023_**

TO: **Application** G-**_19257_**

FROM: **GW:** **_Mitra Khadka/Travis Brown_**
(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 05/05/2023
FROM: Groundwater Section Mitra Khadka/Travis Brown
Reviewer's Name
SUBJECT: Application G- **19257** 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: Petr Anfilofieff County: **Marion**

A1. Applicant(s) seek(s) 0.24 cfs from 2 well(s) in the Willamette Basin, Pudding River 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	MARI 1697	Well 1	Alluvial	0.24[a]	5S/1W-9	340' N, 1390' W fr C1/4 cor S9 OWRD[b]: 445'N, 1335'W fr C1/4 cor S9
2	PROP 307	Well 2	Alluvial	0.24[a]	5S/1W-9	220' N, 1275'W fr C1/4 S9 OWRD[b]: 305'N, 1520'W fr C1/4 cor S9

* 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	180[c]	96	23	4/30/1973	135	0-28	0-135	NA	125-133	180	36	NA
2	180[c]	NA	NA	NA	200	0-30	0-200	NA	NA	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The proposed POA is approximately 2 miles northeast of Woodburn, Oregon. Applicant proposes to pump 0.24 cfs groundwater from two wells (existing well MARI 1697 and proposed well PROP 307) for irrigation of 9.5 acres nursery.

[a] The proposed POAs were evaluated at a total rate of 0.24 cfs.

[b] There is a discrepancy in the metes and bounds description of the POA location used by the applicant relative to the Department's Public Land Survey System (PLSS) projection and the location as identified on the application map. The mapped location is considered to be the most accurate and will be used in this review. The metes and bounds description of the mapped POA location relative to the Department's PLSS projection is listed in Table A3, above.

[c] Well elevation data from LiDAR ground surface elevation (Watershed Sciences, 2009).

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 POAs are not located within ¼ mile of any perennial surface water body, and the wells will produce groundwater from a confined alluvium aquifer. Therefore, per OAR 690-502-0240, the relevant Willamette Basin rules 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) **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 POAs will produce groundwater from water-bearing sand and gravel deposits of the Middle Sedimentary Unit of the Willamette Aquifer system. The aquifer is approximately 60 ft thick and is overlain my approximately 100 ft thick low-permeability silts and clays of the Willamette Silt Unit in the area (Conlon et al., 2005; Gannett and Caldwell, 1998). The underlying Willamette Confining Unit is estimated to be ~1200 ft thick.

There are about 45 active groundwater rights, mostly for irrigation and nursery uses and most likely several more exempt (domestic) wells within approximately 1 mile of the proposed POA locations. Most of the wells in the immediate vicinity draw water from the Willamette Aquifer or the upper Willamette Confining Unit from the depth of 100-200 ft (see attached Well Stat). Reported well yields in the area have a wide range from 10 to 1344 gpm with a median value of 40 gpm. The requested pumping rate (108 gpm) is within the range of the reported yields in the area and lower than reported yield in the proposed POA, MARI 1697.

Hydrographs from the nearby wells (MARI 1607, MARI 1611, MARI 1636, MARI 17630, MARI 50856, MARI 58515) indicate annual high groundwater level decline over the years, with some periods of groundwater level recovery that correspond to above average annual precipitation (see attached Hydrograph). In some case, declines are greater than 20 ft from the highest know groundwater levels (e.g., MARI 1611). However, declining groundwater level trends do not meet the definition of declined excessively or excessively declining per OAR 690-008-0001. Completed depths of those wells range from 213 to 315 ft bls and the wells most likely produce from the Willamette Confining Unit. Two other wells (MARI 1758 and MARI 54954), located about 1.5 mile southeast of proposed POA locations show relatively stable annual high groundwater levels for the last 20-25 years. Those wells were completed to the depth of 145 ft and 179 ft bls, respectively and most likely produce from the same aquifer as proposed POAs.

The nearest permitted well (MARI 1716) is located about 500 ft south of the proposed POAs. Interference with MARI 1716 was quantitatively estimated using a Theis (1935) time-drawdown model for a confined aquifer. Hydraulic parameters used

for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2005; McFarland and Morgan, 1996). The analysis estimates maximum drawdown to be ~12 ft in MARI 1716 after 244 days of continuous pumping at the maximum requested rate (see attached Well to Well Interference). The proposed use of groundwater is not anticipated to cause Substantial and Undue Interference with neighboring wells that meets a definition of well-to-well injury.

The available hydrogeological and groundwater levels data indicate that the proposed groundwater reservoir is not over-appropriated and is within the capacity of resources in the area. However, in order to monitor and protect the resources and other groundwater rights in the area, the conditions specified in Item B1(d) and B2(c) are recommended for any permit issued pursuant to this application.

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 (Willamette Aquifer)**	☒	☐
2	**Alluvial (Willamette Aquifer)**	☒	☐

Basis for aquifer confinement evaluation: The proposed well (MARI 1697) and nearby wells completed in the Willamette Aquifer or Willamette Confining Unit report SWLs above the water-bearing zones (see attached Well Stat). Additionally, available well logs in the area indicate ~100 ft thick low permeability clay/silt layer (Willamette Silt Unit) overlying sand and gravel aquifer (Willamette Aquifer).

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**	**Pudding River**	**~135**	**~105-110**	**4200**	☒	☐	☐	☐	☒
2	**1**	**Pudding River**	**~135**	**~105-110**	**4080**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Reported groundwater elevations from nearby wells in the alluvial aquifer indicate that the groundwater in the area is above the elevation of surface water in the Pudding River within 1 mile of the proposed POAs. Water table maps in the area (Woodward et al., 1998) show the groundwater in the alluvial aquifer discharging to the Pudding River.

Water Availability Basin the well(s) are located within: WID # 151, PUDDING R>MOLALLA R>AB MILL CR

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**	☐	☐	**IS73534A**	**11**	☒	**71**	☐	**<25%**	☒
2	**1**	☐	☐	**IS73534A**	**11**	☒	**71**	☐	**<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 requested pumping rate (0.24 cfs) is greater than 1% of instream water right (IS73534A – 11 cfs) within a mile of proposed POAs. Per OAR 690-009-0040(3c), the potential for substantial interference (PSI) is assumed.

The anticipated interference with SW 1 due to the proposed use was quantitatively estimated using the Hunt (2003) model. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2005; McFarland and Morgan, 1996) or are within a typical range of values for the given parameter within the hydrogeologic regime (Freeze and Cherry, 1979). Results indicate that interference with SW 1 is not anticipated to exceed 25 percent of the rate of withdrawal within the first 30 days of continuous pumping (See attached Stream Depletion Model Analysis).

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 File: G-19257

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, 83 p.

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, Professional Paper 1424-A, 32 p: U. S. Geological Survey, Reston, VA.

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

McFarland, W.D., and Morgan, D.S., 1996, Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington, Water Supply Paper 2470-A, 58 p: U. S. Geological Survey, Reston, VA.

Pumping Test Report: MARI 1717, MARI 1634, MARI 17630, MARI 56347, MARI 1519, MARI 1488, MARI 58399.

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, American Geophysical Union Transactions, vol. 16, p. 519-524.

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.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Hood to Coast, Oregon: Portland, OR, May 27.

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:** _____

_____

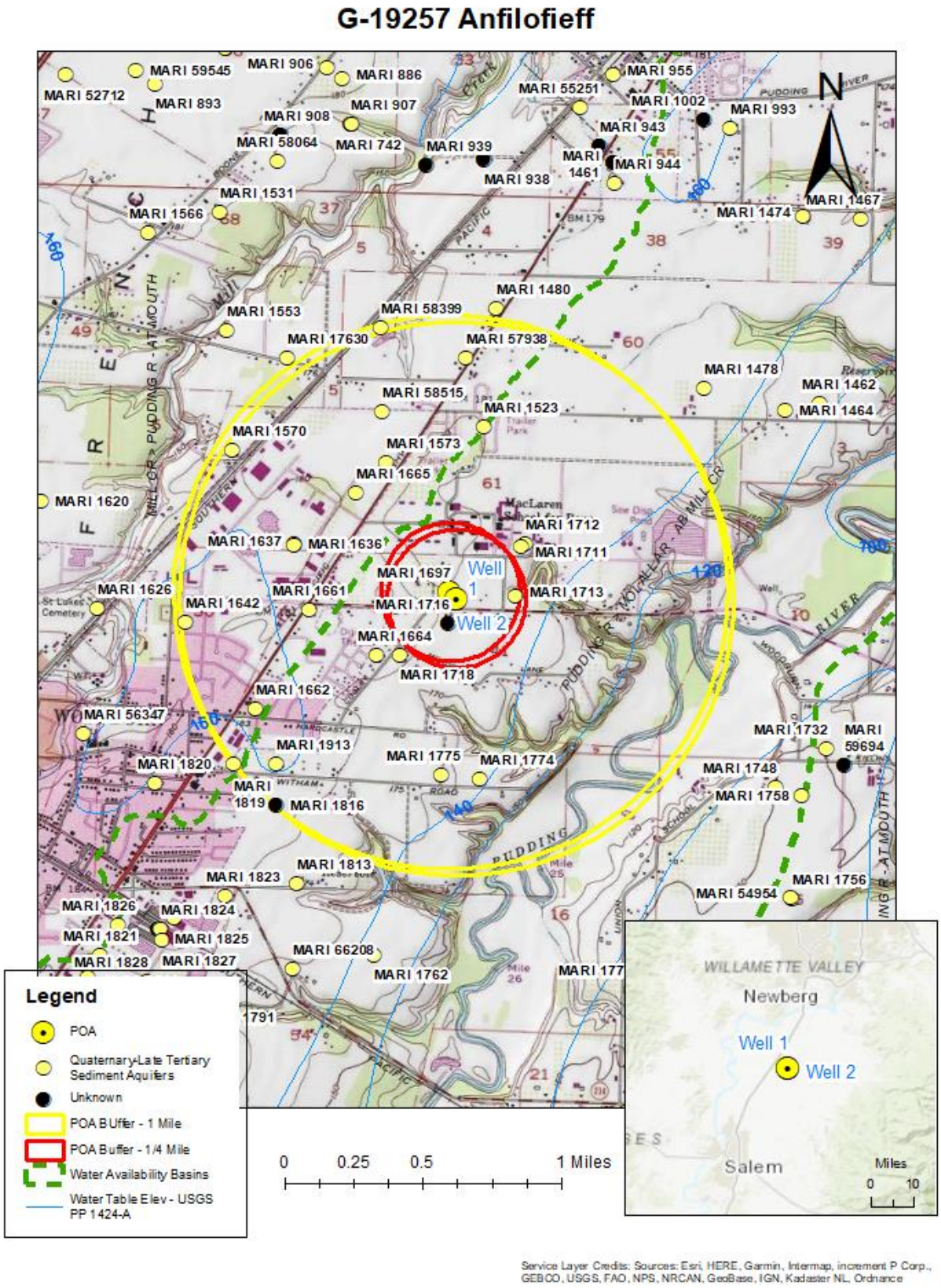
_____

_____

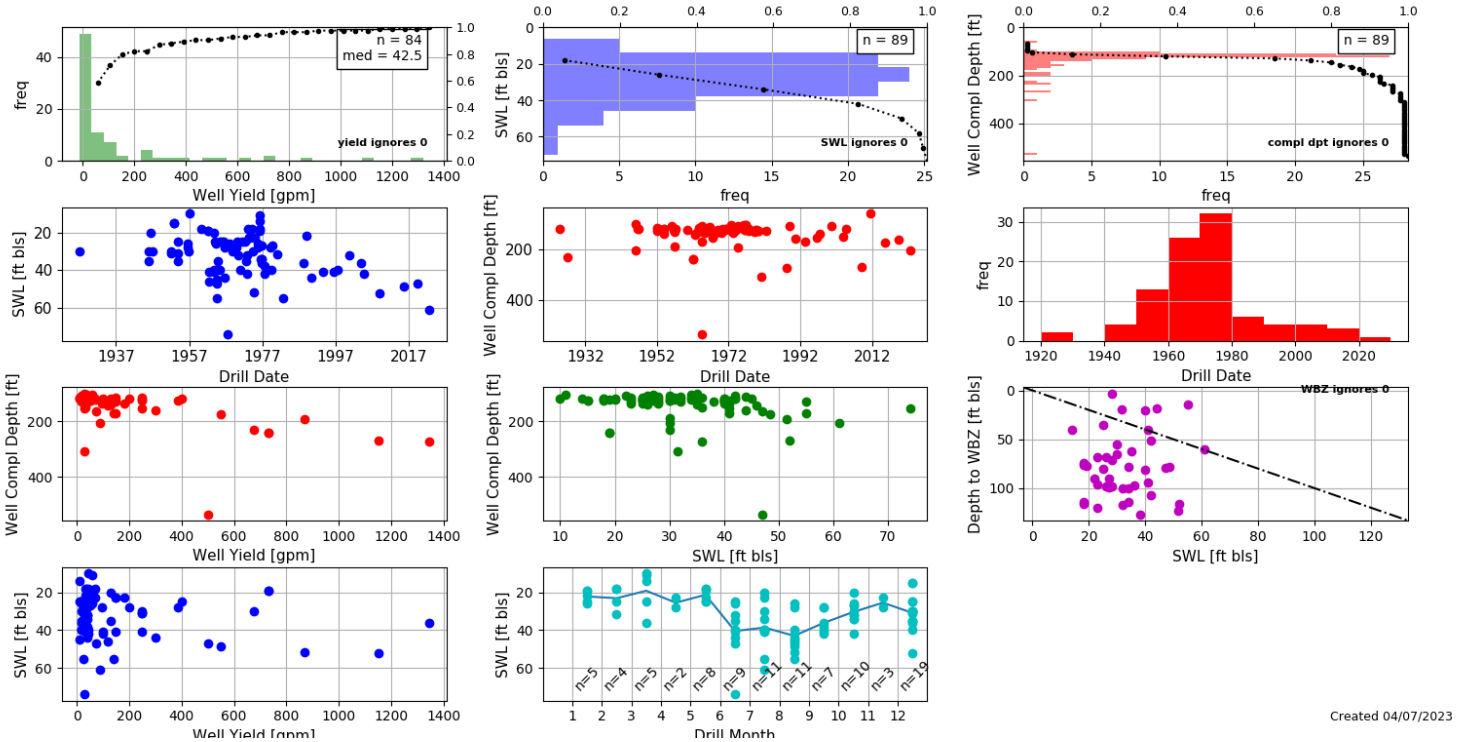
_____

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

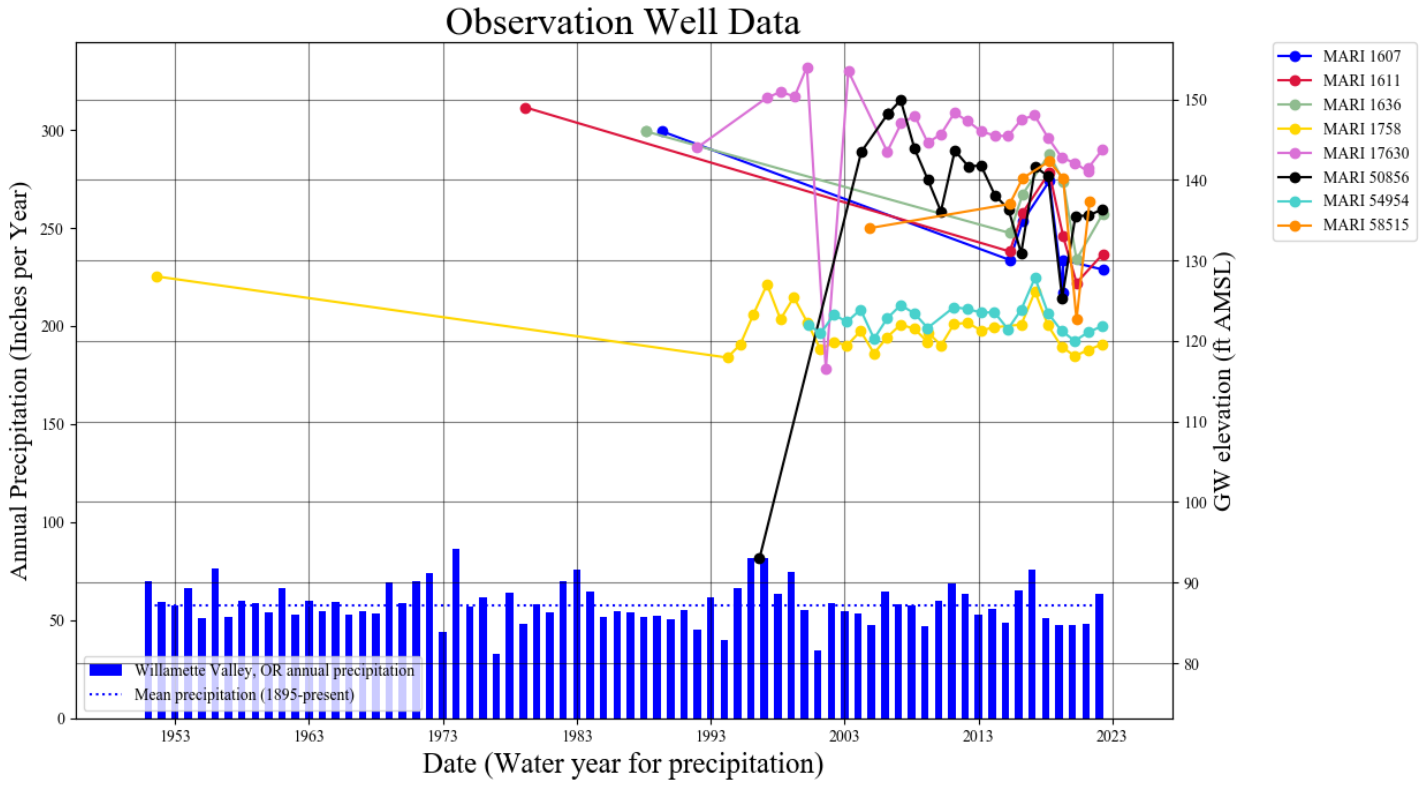
Well Location Map



Well Statistics (5S/1W-8-9)

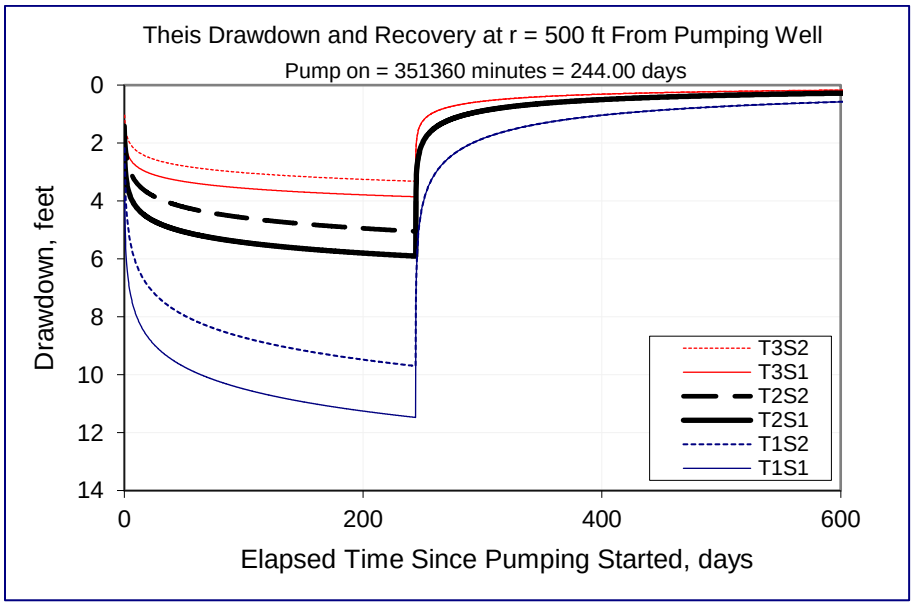


Water-Level Measurements in Nearby Wells



Well Interference Analysis

Input Data:	Var Name	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Units**	
Total pumping time	t		**244**		d	
Radial distance from pumped well:	r		**500**		ft	**Q conversions**
Pumping rate	Q		**108**		gpm	108.00 gpm
Hydraulic conductivity	K	**25**	**52**	**83**	ft/day	0.24 cfs
Aquifer thickness	b		**60**		ft	14.44 cfm
Storativity	S_1		**0.0001**			20,791.44 cfd
	S_2		**0.0005**			0.48 af/d
Transmissivity Conversions	T_f2pd	1500	3120	4980	ft2/day	Recalculate
	T_ft2pm	1.0416667	2.1666667	3.4583333	ft2/min	
	T_gpdpft	11220	23337.6	37250.4	gpd/ft	



Water Availability Report

Water Availability Analysis
Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN
Water Availability as of 4/11/2023

Watershed ID #: 151 (Map)
Date: 4/11/2023

Exceedance Level: 80%
Time: 10:07 AM

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

Water Availability Analysis
Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN
Water Availability as of 5/4/2023

Watershed ID #: 151 (Map)
Date: 5/4/2023

Exceedance Level: 80%
Time: 3:35 PM

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

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF151A	CERTIFICATE	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
IS73532B	CERTIFICATE	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
IS73533A	CERTIFICATE	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
IS73534A	CERTIFICATE	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Maximum		36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00

Stream Depletion Analysis

Application type:	G
Application number:	19257
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.24
Pumping duration (days):	244.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	4080	4080	4080	ft
Aquifer transmissivity	T	1500	3120	4980	ft2/day
Aquifer storativity	S	0.0001	0.0001	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Aquitard saturated thickness	ba	50	50	50	ft
Aquitard thickness below stream	babs	35	35	35	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240
Depletion (%)	0	1	1	0	1	1	1	1	1	1	1