Groundwater Application Review Summary Form

Application # G- _19328_

GW Reviewer _Gabriela Ferreira_ Date Review Completed: _December 4, 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 **_December 4, 2023_**

TO: **Application** G-**_19328_**

FROM: **GW: _Gabriela Ferreira_**
(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 December 4, 2023
FROM: Groundwater Section Gabriela Ferreira
Reviewer's Name
SUBJECT: Application G- **19328** 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: **Randy Steffen** County: **Marion**

A1. Applicant(s) seek(s) 0.43 cfs from one well(s) in the Willamette Basin, subbasin

A2. Proposed use Irrigation (34.5 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)**:

POA 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 7668	**Well 1**	**CRB**	0.43	7S / 2W - 24 SW-NW	650' N, 1640' E fr NW cor DLC 64

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	330	22	193	--	--	1000	145	Air

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	220[a]	194	44	11/20/1978	44.0	11/20/1978

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are ~ 3 miles east of Salem city limits. Applicant proposes to irrigate up to 34.5 acres by one well already constructed (MARI 7668) with a maximum annual volume of 86.25 af. The proposed POA is also an authorized POA for Irrigation Use on 116.1 acres with a maximum rate of 1.43 cfs under **Certificate 75581** (priority date 11/20/1978). The proposed POA will therefore be assessed at a **total combined rate of 1.86 cfs (~834 gpm)**
[a] Land surface elevation data from LiDAR ground surface elevation (Watershed Sciences, 2009).

A5. ☐ **Provisions of the** 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:

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) **7RLN (15 ft, Willamette Basalt Condition), 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 _____ 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 within the Columbia River Basalt Group (CRBG/CRB) Miocene-aged flood-lavas, which consist of a series of layered basalt flows ranging in thickness from 10 to 100 feet. Relatively permeable and productive interflow zones are encountered between layers of basalt flows, separated by low-permeability dense interior that act as confining beds. As such, the CRBG aquifer has relatively low storage capacity (bulk porosity estimated to average 3%) and withdrawal from CRBG aquifers can quickly impact nearby wells. The CRBG is overlain by basin-fill deposits, estimated to be approximately 50 to 150 feet in thickness based on the POA well report and nearby wells (MARI 59175, MARI 18003). Different interflow zones have widely variable production rates, typically attributed to the amount of erosion and vesiculation in the interflow zones. (Gannett & Caldwell, 1998)

Median yield for nearby wells was 50 gallons per minute and typically ranged from 10 to 200 gpm with a few wells producing 200 to 1200 gpm (see attached well statistics). The reported yield for the proposed POA, MARI 7668, was 1000+ gpm by air test in 1978. The requested rate of ~834 gpm is within the upper range of nearby wells.

The nearest known CRBG well (MARI 7053) is approximately 2000 feet north of the proposed POA. MARI 7053 is an irrigation well associated with GR Claim 1221 and completed to a depth of 350 feet below land surface (bls). The attached Theis drawdown analysis models potential impacts on MARI 7053 assuming the full duty and rate of the proposed POA. Transmissivity values are based on pump tests from nearby basalt wells. At the lowest observed transmissivity (600 ft^2/day), drawdown temporarily exceeds 25 feet; however, drawdown is nearly or less than 25 feet for the median and highest

reviewed transmissivity values. It appears unlikely that interference in excess of the typical permit condition limits (Condition 7i) would occur at MARI 7053 as a result of the requested withdrawal. **In order to protect senior users, Condition 7RLN (Willamette Basalt) is strongly recommended for any permit issued in association with this application.**

Water level trends for wells within 2 miles of the proposed POA that are similarly constructed and utilize the CRBG are generally stable or slightly declining (see attached hydrograph). Of the 15 wells included, 4 have declined between 5 and 8 feet in the past 20 to 30 years (MARI 7003; MARI 7737; MARI 9943; and MARI 17077) with an average yearly decline of 0.10 to 0.26 feet per year. The remaining 11 wells are generally stable with less than 5 feet of variability from annual spring high measurements. There is not a preponderance of evidence to support that the water levels in the CRBG groundwater reservoir are declined excessively or excessively declining; therefore, the groundwater reservoir is not over-appropriated.

Two water level measurements are available for the proposed POA, MARI 7668, from 1978 and 1990. The reported water levels indicate a decline of 12 feet during the available record. Based on the available measurements, it appears likely that water levels have already declined in excess of the typical permit condition limits for basalt wells (Condition 7RLN; 15 feet). **Based on the available water level data for the proposed POA, the proposed use is considered beyond the capacity of the resource.**

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	**CRB**	☒	☐

Basis for aquifer confinement evaluation: The well report for MARI 7668 indicates the water bearing zone is deeper than 194 feet bls and the SWL was 44 feet bls. Several other nearby wells completed in CRB report SWLs above the water-bearing zone(s), indicating a confined aquifer or series of aquifers.

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**	**175**	**175 – 215[a]**	**1,320**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: The proposed POA (MARI 7668) primarily produces from water-bearing zones within the CRBG below 26 feet amsl and the SWL was 175 feet amsl, indicating highly confined conditions. The nearby surface water sources do not appear to have incised through the confining layer overlying the WBZs utilized by the proposed POAs. The aquifer utilized by the POA appears to be isolated from overlying local streams.

Water Availability Basin the well(s) are located within: **WID #152:** Pudding River > Molalla River – Above Howell Prairie

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?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: No hydraulically connected surface water sources were identified within 1 mile of the proposed POA.

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:** No hydraulically connected surface water sources were identified within 1 mile of the proposed POA.

References Used:

Application File G-19328

Well reports: MARI 7668, MARI 6328, MARI 7003, MARI 7067, MARI 7074, MARI 7737, MARI 9943, MARI 11337, MARI 15392, MARI 17077, MARI 18003, MARI 50626, MARI 53068, MARI 53069, MARI 59175, MARI 59176

Pumping tests: MARI 53068, MARI 6333, MARI 9943

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.

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.

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.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

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

Watershed Sciences, 2009, *LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon*: Portland, OR, December 21

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 #:** 1 **Logid:** MARI 7668

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

PUDDING R > MOLALLA R - AB HOWELL PRAIRIE
WILLAMETTE BASIN
Water Availability as of 12/2/2023

Watershed ID #: 152 (Map)
Date: 12/2/2023

Exceedance Level: 80%
Time: 1:50 PM

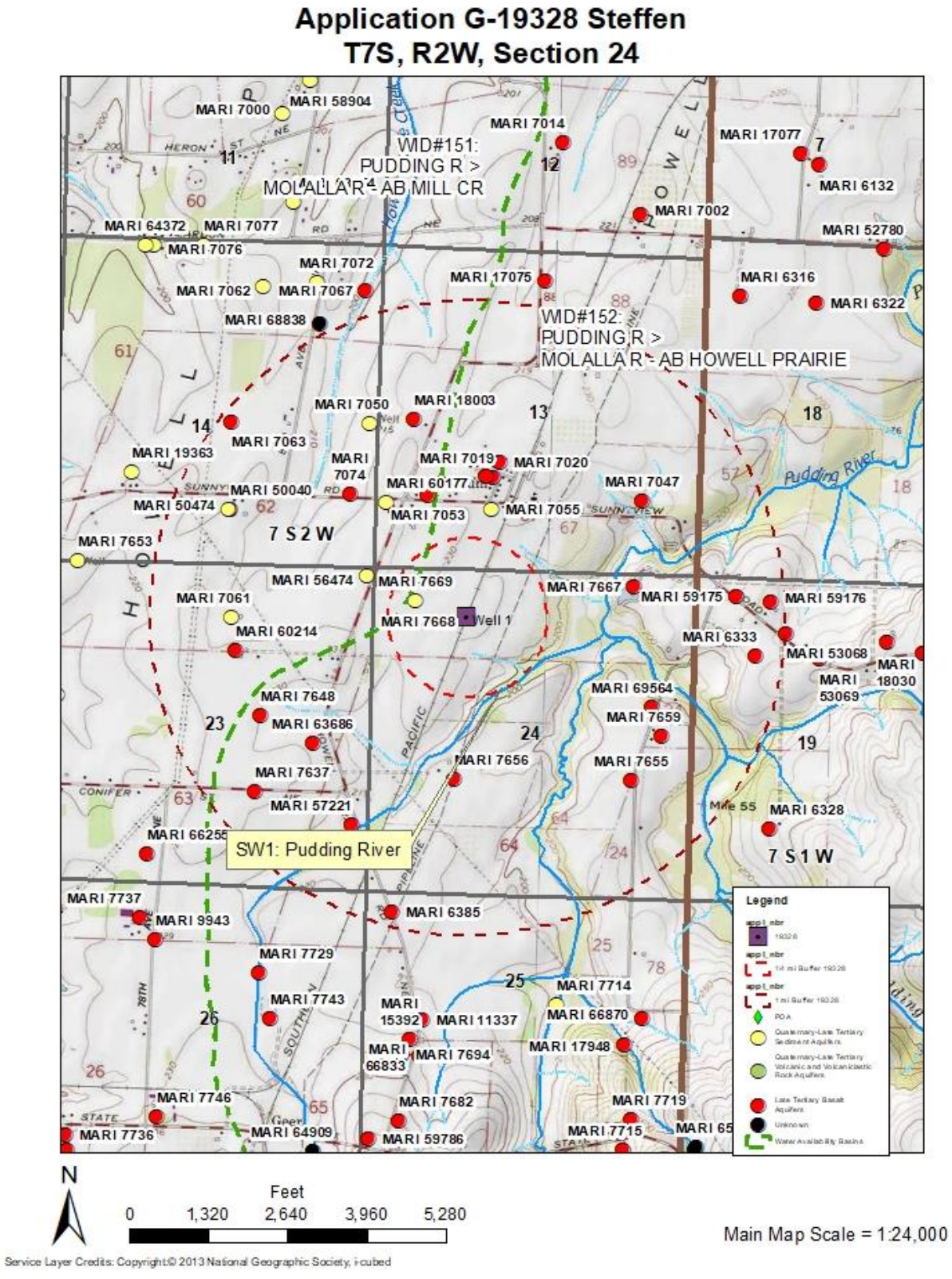
Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

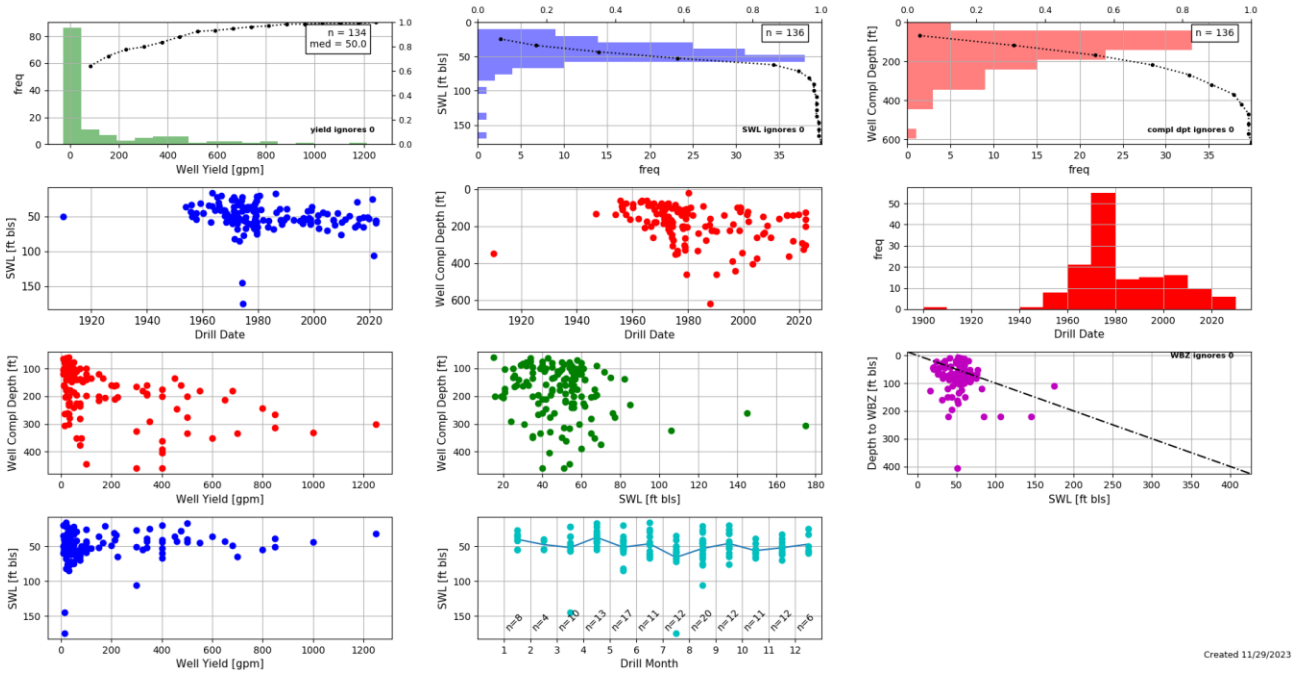
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	603.00	69.80	533.00	0.00	10.00	523.00
FEB	649.00	60.80	588.00	0.00	10.00	578.00
MAR	587.00	39.90	547.00	0.00	10.00	537.00
APR	451.00	21.20	430.00	0.00	10.00	420.00
MAY	235.00	14.30	221.00	0.00	10.00	211.00
JUN	111.00	29.30	81.70	0.00	10.00	71.70
JUL	43.60	45.10	-1.48	0.00	10.00	-11.50
AUG	24.70	37.30	-12.60	0.00	10.00	-22.60
SEP	22.70	22.20	0.53	0.00	10.00	-9.47
OCT	38.90	3.98	34.90	0.00	10.00	24.90
NOV	233.00	18.60	214.00	0.00	10.00	204.00
DEC	608.00	63.80	544.00	0.00	10.00	534.00
ANN	385,000.00	25,700.00	360,000.00	0.00	7,240.00	353,000.00

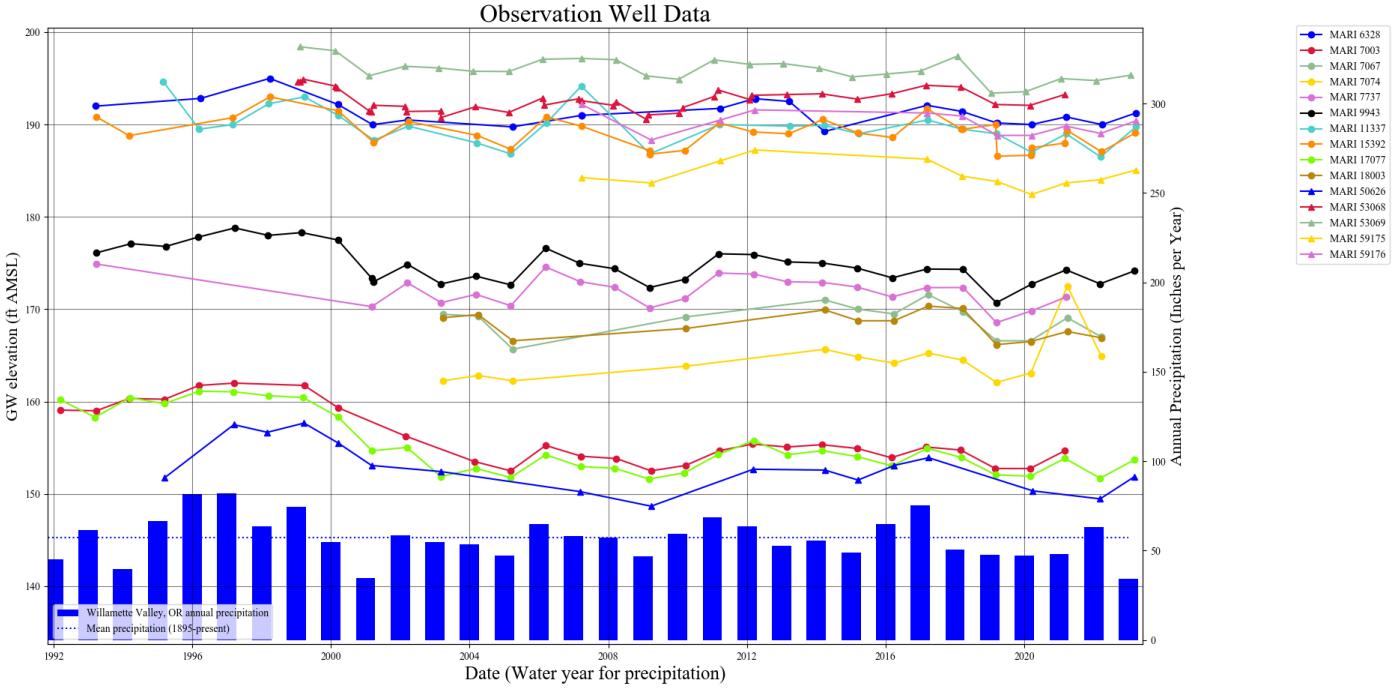
Well Location Map



Well Statistics



Water-Level Measurements in Nearby Wells



Theis Interference Analysis

Theis Time-Drawdown Worksheet v.5.00

Calculates Theis nonequilibrium drawdown and recovery at any arbitrary radial distance, r, from a pumping well for 3 different T values and radial distance, r, from a pumping well for 3 different T values and 2 different S values.

Written by Karl C. Wozniak September 1992. Last modified December 17, 2019

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		102		d	
Radial distance from pumped well:	r		2000		ft	Q conversions
Pumping rate	Q		1.86		cfs	834.77 gpm
Hydraulic conductivity	K	7	40	60	ft/day	1.86 cfs
Aquifer thickness	b		90		ft	111.60 cfm
Storativity	S_1		0.0001			160,704.00 cfd
	S_2		0.0005			3.69 af/d
Transmissivity Conversions	T_ft2pd	630	3600	5400	ft2/day	
	T_ft2pm	0.4375	2.5	3.75	ft2/min	Recalculate
	T_gpdpft	4712.4	26928	40392	gpd/ft	

Use the Flecalculate button if recalculation is set to manual