

Groundwater Application Review Summary Form

Application # G- 19281

GW Reviewer Andrew Wentworth/Travis Brown Date Review Completed: 07/05/2023

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

July 5, 2023

TO: **Application G- 19281**

FROM: **GW: Andrew Wentworth/Travis Brown**
 (Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic
 NO 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 07/05/2023
 FROM: Groundwater Section Andrew Wentworth/Travis Brown
 Reviewer's Name
 SUBJECT: Application G- 19281 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: Matt & Teresa Dougherty County: Marion

A1. Applicant(s) seek(s) 0.1337 cfs from 3 well(s) in the Willamette Basin,
Abiqua Creek subbasin

A2. Proposed use Irrigation (19 acres, 33.25 AF) Seasonality: March 1st – October 31st

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 3357	1	CRBG	0.1337 cfs rotated between wells	6.00S-1.00W-25-SE SW	428' N, 2,059' E fr SW cor,S 25
2	MARI 3334	2	CRBG		6.00S-1.00W-25-SE SW	423' N, 2,054' E fr SW cor,S 25
3	MARI 3675	3	CRBG		6.00S-1.00W-36-NE NW	258' S, 2,226' E fr SW cor,S 25

* Alluvium, Columbia River Basalt Group (CRBG), Bedrock, etc.

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	382 ^b	209	166	05/09/1975	216	0-25	0-35	n/a	n/a	15	50	1-hr air
2	385 ^b	229	203	03/21/1983	275	0-19	+1-19	0-275	195-275	33	n/a	1-hr air
3	436 ^b	155	140	06/14/1958	220	0-54	0-54	n/a	n/a	4.5	140	bailer

A4. **Comments:** ^aThere are small discrepancies in the metes and bounds description of the POA locations used by the applicant relative to the Department's Public Land Survey System (PLSS) projection and the locations as identified on the application map. The mapped location is considered to be the most accurate and will be used in this review.

^bWell 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: OAR 690-502-0240 classifies use from unconfined alluvial aquifers. This application proposes use from a confined portion of the Columbia River Basalt Group aquifer, therefore the basin rules laid out in OAR 690-502-0240 are not activated.

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);
 - 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 wells will produce from a water-bearing zone within the Columbia River Basalt Group (CRBG). Aquifers in CRBG are typically thin interflow zones between lava flows and confined by thicker flow interiors that have low porosity and low permeability (Conlon et al. 2005, Gannet and Caldwell 1998).

Groundwater level data in the immediate vicinity of the proposed POAs show that groundwater levels have declined excessively [>50 feet, OAR 690-008-001(4)(d)] over the period of six decades (See attached Hydrograph). **Based on the analysis of available groundwater data, we have determined that groundwater for the proposed use is over-appropriated.**

The three wells listed as proposed POAs in the application have a combined reported yield of 52.5 gpm, which is slightly less than the applicant's combined requested rate of ~60 gpm. Two of the three wells (MARI 3675 and MARI 3357) appear to have been fully dewatered after 1 hour of well testing, indicating that the reported yields are not likely to be sustained for long periods of continuous pumping. However, the neighboring wells (MARI 3352, MARI 3356, and MARI 3332), completed at around same elevation, have reported well yields that range from 16 to ~30 gpm. **This suggests that the aquifer can potentially supply the requested rate, but not from an individual well and likely not from the proposed POAs as currently constructed.**

There are 19 nearby groundwater users in T6S-R1W-S25-SE SW, mostly without precise locations. The nearest groundwater user identified by the tax lot listed on the well log (MARI 60354, an exempt domestic well) is ~400 ft northeast of proposed POA Well 1. MARI 60354 is completed to a depth of 393 ft bls and appears to produce from the same water-bearing zone as proposed POAs. It is likely the proposed use would cause some degree of well-to-well interference with MARI 60354. Interference with MARI 60354 was quantitatively estimated using a Theis (1935) distance-drawdown 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). The analysis shows that the pumping at the proposed well may cause <10 ft drawdown (using the CRB median transmissivity value in the area) at the nearest well after 245 days of pumping at the maximum requested rate (see attached Well Interference Analysis). **The proposed use of groundwater is not anticipated to cause interference with neighboring wells sufficient to meet the definition of injury.**

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	Columbia River Basalt Group	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Columbia River Basalt Group	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Columbia River Basalt Group	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: In general, the Columbia River Basalt (CRBG) aquifers are confined by the dense interflow zones, which restrict vertical movement of groundwater. The well log for MARI 3334 reports static water level of 203 ft below land surface, some 26 ft above the depth at which water was first found (229 ft), corroborating the confined nature of the water-bearing zone of the CRBG at this location.

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	Un-named Trib.–Abiqua	216	~240–400	1,220–5,280	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Un-named Trib.–Abiqua	182	~240–400	1,220–5,280	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Un-named Trib.–Abiqua	296	~240–400	910–5,280	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The most recent groundwater elevations, measured in May 1975 and March 1983, at MARI 3357 and MARI 3334, respectively, were lower than surface water elevations measured within 1 mile of the proposed existing POAs. The groundwater elevation measured when MARI 3675 was drilled in 1958 was higher than surface water elevations. Because more recent groundwater elevations have fallen below the surface water elevation, it is assumed that while there may be the potential for hydraulic connection, the aquifer is not presently hydraulically connected to surface water.

Water Availability Basin the well(s) are located within: ABIQUA CREEK > PUDDING RIVER – AT MOUTH (WID 299)

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments:

Not applicable.

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"/>

Comments:

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
2	1	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%
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													
(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:

Not applicable.

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-19281 and application map received 4/22/2022.

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

Tolan, Terry, Beeson, Marvin, Wheeler, K. L., 1999, Geologic Map of the Scotts Mills, Silverton, and Stayton Northeast 7.5 Minute Quadrangles, Northwest Oregon: A Digital Database: U. S. Geological Survey Open-File Report 99-141, 11 pp., <https://pubs.usgs.gov/of/1999/0141/>.

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: _____

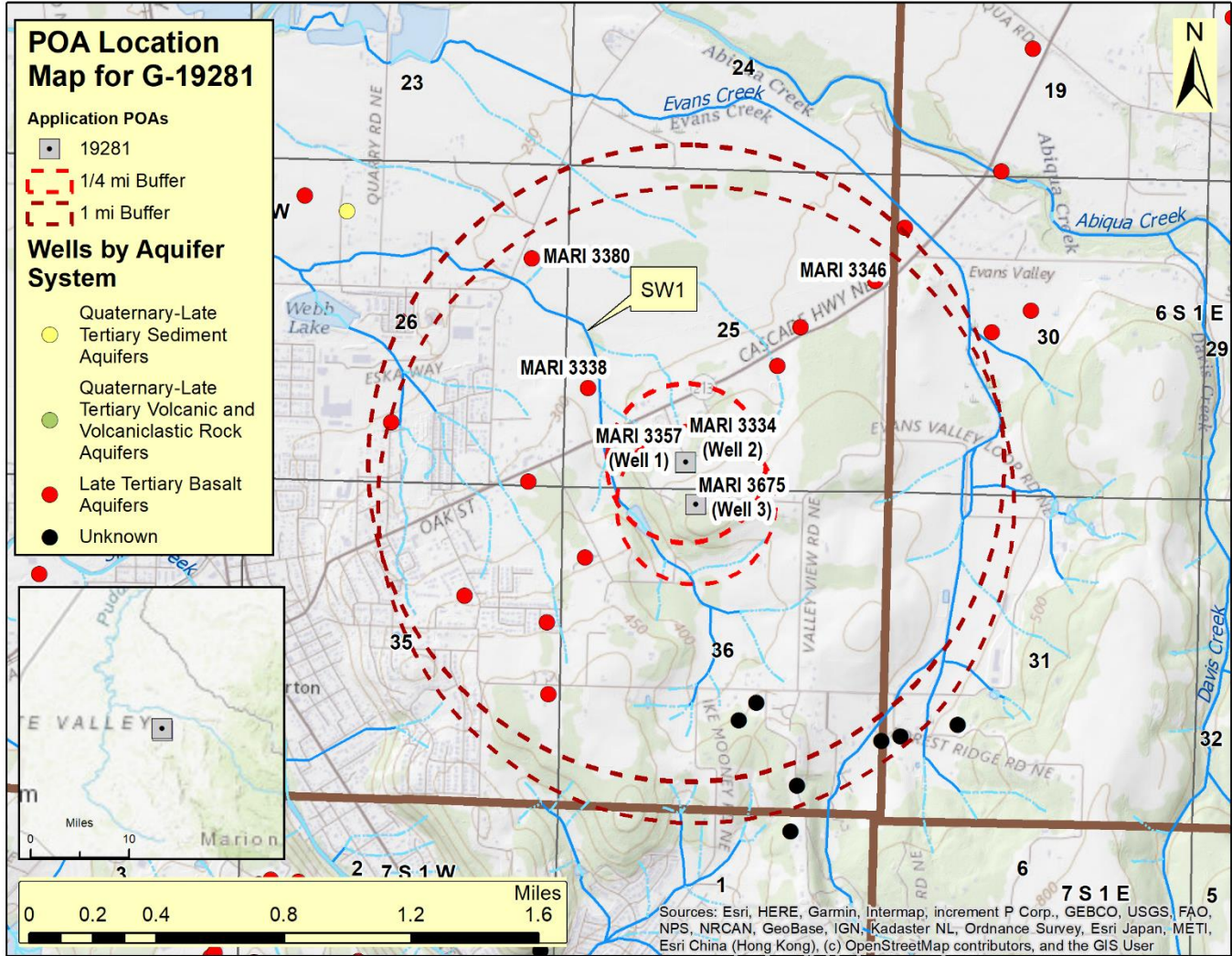
D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

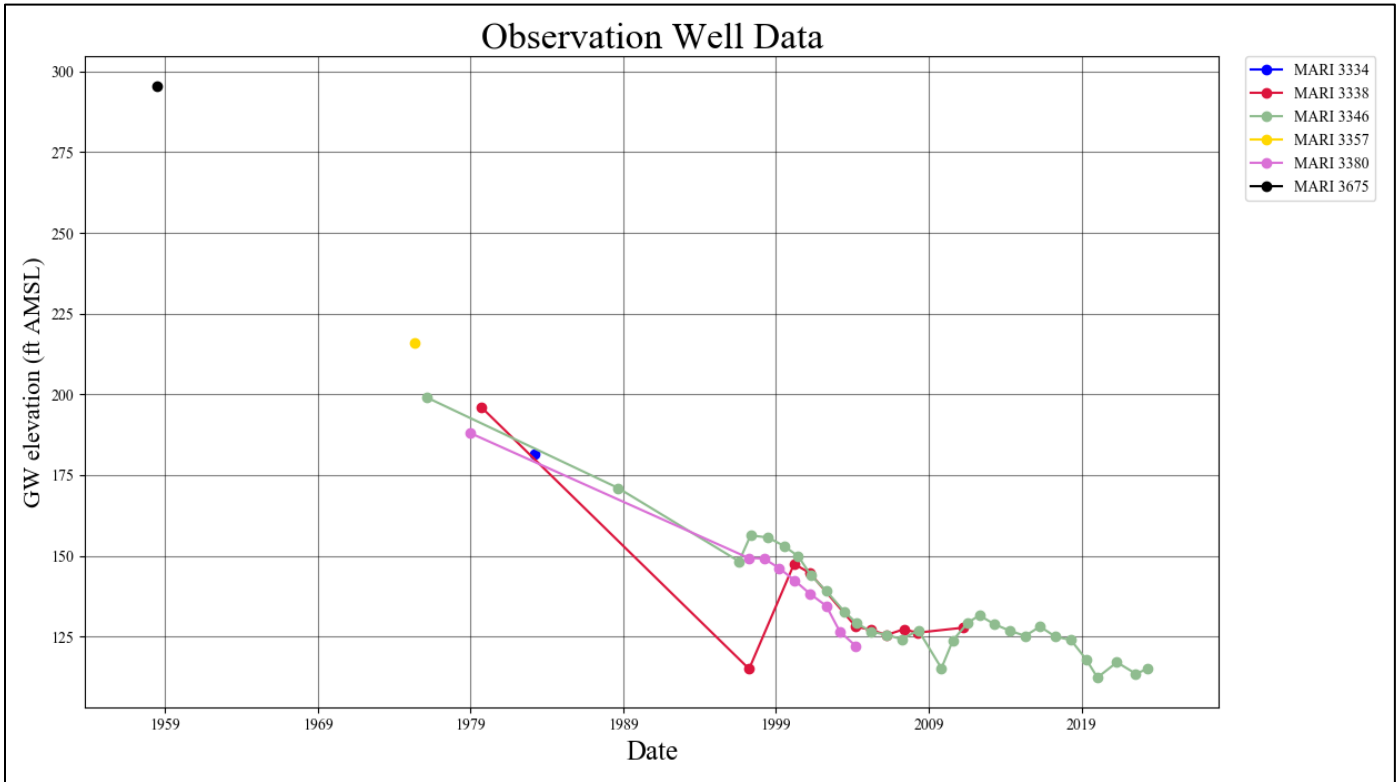
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

Well Locations Map



Highest Annual Water-Level Measurements in Nearby Wells



Theis Interference Analysis

Note: Several well logs were identified for wells probably located within 1/4 mile of the proposed new well locations. However, the exact location of the nearest well could not be determined with a high degree of confidence. In order to assess the scenario in which the greatest amount of interference would occur, we assumed the nearest well was located adjacent to the residence on the neighboring tax lot (400 feet from the POA 1).

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		245		d	
Radial distance from pumped well:	r		400		ft	Q conversions
Pumping rate	Q		0.1337		cfs	60.00 gpm
Hydraulic conductivity	K	9	20	35	ft/day	0.13 cfs
Aquifer thickness	b		50		ft	8.02 cfm
Storativity	S_1		0.0002			11,551.68 cfd
	S_2		0.0005			0.27 af/d
Transmissivity Conversions	T_f2pd	450	1000	1750	ft ² /day	
	T_ft2pm	0.3125	0.69444444	1.21527778	ft ² /min	
	T_gpdft	3366	7480	13090	gpd/ft	

Use the Recalculate button if recalculation is set to manual

