Groundwater Application Review Summary Form

Application # G- 19213

GW Reviewer Phillip I. Marcy Date Review Completed: 10/29/2021

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 **_October 29, 2021_**

TO: **Application** G-**_19213_**

FROM: **GW:** **_Phillip I. Marcy_**
(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 10/29/2021
FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name
SUBJECT: Application G- **19213** 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: **Ben Norton** County: **Baker**

A1. Applicant(s) seek(s) 2.75 cfs from 2 well(s) in the Powder Basin, Burnt River subbasin

A2. Proposed use Supplemental Irrigation (164.2 acres) Seasonality: April 1st – October 31st (214 days)

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	Proposed	1	Alluvium	2.75	13S/37E-20 NE-SW	1050'S, 407'W fr C1/4 cor S 20
2	Proposed	2	Alluvium	2.75	13S/37E-20 NW-NW	405'N, 115'E fr NW cor S 20
3						
4						

* 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	4166	NA	NA	NA	100	0-40	0-50	Unk	Unk	NA	NA	NA
2	4086	NA	NA	NA	100	0-40	0-50	Unk	Unk	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to construct two wells for supplemental irrigation of 164.2 acres. The geologic setting surrounding the proposed POA locations is largely made up of Tertiary basin-fill sediments overlying faulted and folded accreted terrane rocks of Mesozoic age. Wells in this area typically report low yields, and it is questionable whether the proposed rate of production is possible in the given setting.

A5. ☒ **Provisions of the** Powder 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) **"Large Water Use Reporting"; 7N**;

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:** Water level data near the proposed POA wells is sparse, with an extended record available for nearby BAKE 1520 from 1964-1990, but observations were discontinued. There are no recent and relevant groundwater level data for the proposed aquifer.

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	**Miocene Sediment (Tf1 of Robyn, 1977; Tf of Brown, 1966)**	☐	☒
2	**Miocene Sediment (Tf1 of Robyn, 1977; Tf of Brown, 1966)**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Well reports in the area and of similar depth report little to no head elevation change between water-bearing zones encountered. The sedimentary sequence here appears to be quite deep, with one nearby well drilled to 600' in depth reporting a succession of clays with little variation. In this scenario, fine-grained lithologies are utilized as the aquifer, as opposed to many situations where such low permeability lithologies would function as a confining layer. With little to no change in permeability throughout the sequence utilized by local wells, no vertical pressure gradient is evident. The combination of low transmissivity and high storage likely in the proposed aquifer suggest a low diffusivity, indicating that the effects of groundwater pumping may be slow to propagate but may be more severe in the areas near each pumping well.

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**	**South Fork Burnt River**	**~4146**	**3825-4042**	**13000**	☒	☐	☐	☐	☒
2	**1**	**South Fork Burnt River**	**~4066**	**3825-4042**	**9500**	☒	☐	☐	☐	☒
1	**2**	**Job Creek**	**~4146**	**4048-4198**	**4520**	☒	☐	☐	☐	☒
2	**2**	**Job Creek**	**~4066**	**4048-4198**	**5960**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Groundwater elevations are estimated here to be about 20 feet below land surface in the proposed POA wells, as many wells in the area of similar depth report similar depth to water. Surface water elevations represent the reach of the South Fork Burnt River between Whited Reservoir and Unity Reservoir, where pumping at the proposed locations is most likely to produce impacts to surface water. Elevations given for Job Creek are the extent within one mile of POA well 1.

Water Availability Basin the well(s) are located within: Job CR > Burnt R – At Mouth

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	**2**	☐	☐	**NA**	**NA**	☐	**0.08**	☒	**<<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: Due to its location within less than one mile from Job Creek and very low dry season flows, POA Well 1 has triggered Potential to Substantially Interfere (PSI) with local surface water. POA Well 2 is not within one mile of local surface water sources.

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:** Impacts from proposed pumping from the two proposed POA wells have the potential produce a reduction of discharge in downstream reaches to nearby surface water sources. Due to properties of the aquifer (Low transmissivity, high storage), these effects are likely increase slowly over time as storage is diminished in the aquifer materials near each pumping well. As pumping continues, the area of the aquifer affected expands outward to inevitably intersect local drainages. According to our conceptual model, seasonal impacts are likely to be attenuated but long-term changes to storage will contribute to year-round surface water depletion.

POA well 2 is outside of one mile from Job Creek, and therefore was not evaluated for impacts under Division 9, but POA well 1 is within one mile of the creek, and has triggered PSI under Division 9, due to the pumping rate being greater than 1% of the 80% exceedance rate for Job Creek (0.08 CFS). In order to overcome this finding, POA well 1 must be moved to a location outside of 1 mile from Job Creek, or the rate must be lowered to 0.0008 CFS.

References Used: Application G-19213, GWIS database

Robyn, T.L., 1977, Geology and petrology of the Strawberry Volcanics, NE Oregon, Unpub. thesis, University of Oregon, Eugene, OR., map scale 1:24,000.

Brown, C.E., Thayer, T.P., 1966, Geologic map of the Canyon City quadrangle, northeastern Oregon, Misc. Invest. Map, 447, U.S. Geological Survey, Washington, DC., map scale 1:250,000.

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.**

Water Availability Tables

JOB CR > BURNT R - AT MOUTH

Watershed ID #: 30920229 Basin: POWDER Exceedance Level: 80

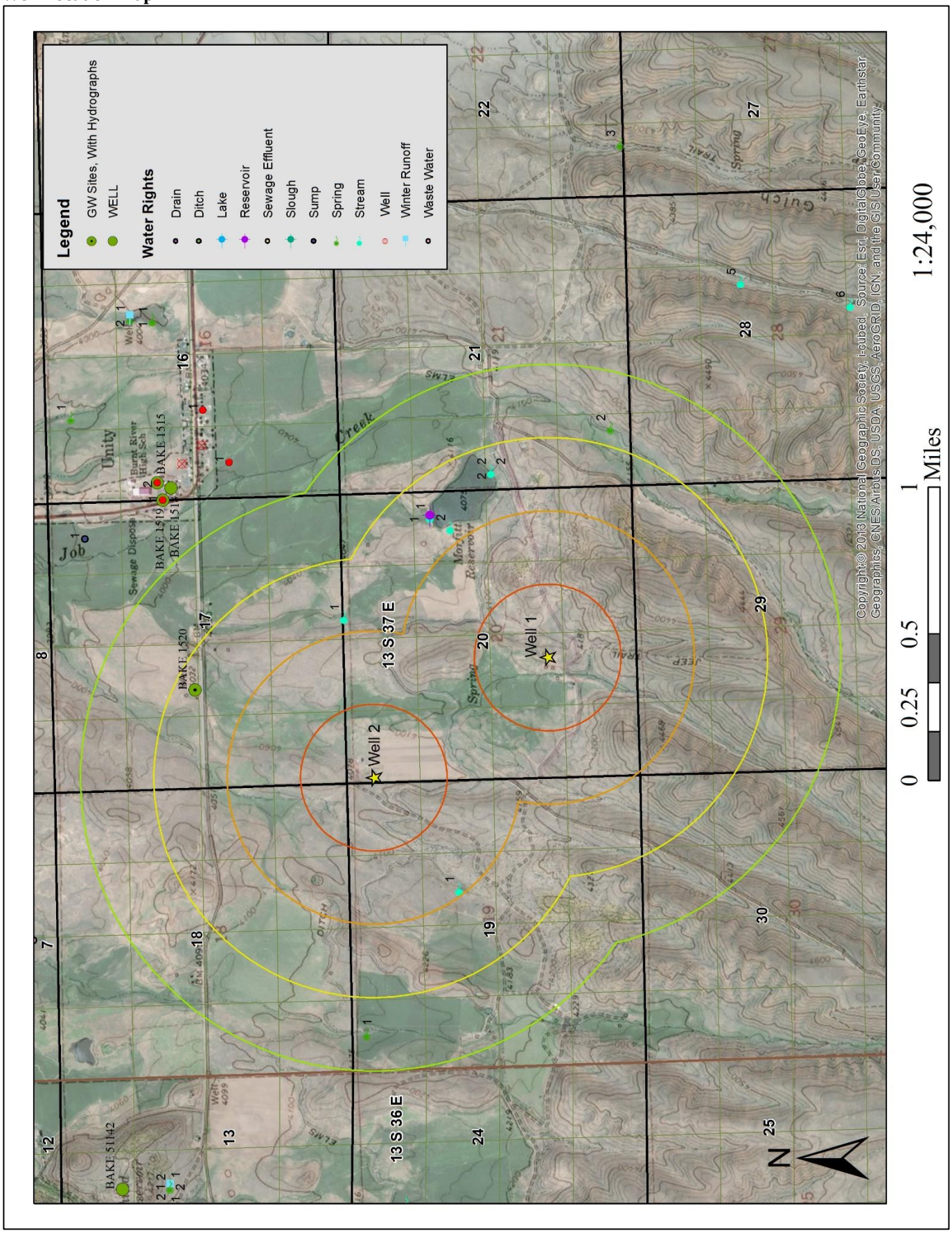
Time: 3:24 PM Date: 10/28/2021

Monthly values are in cfs.

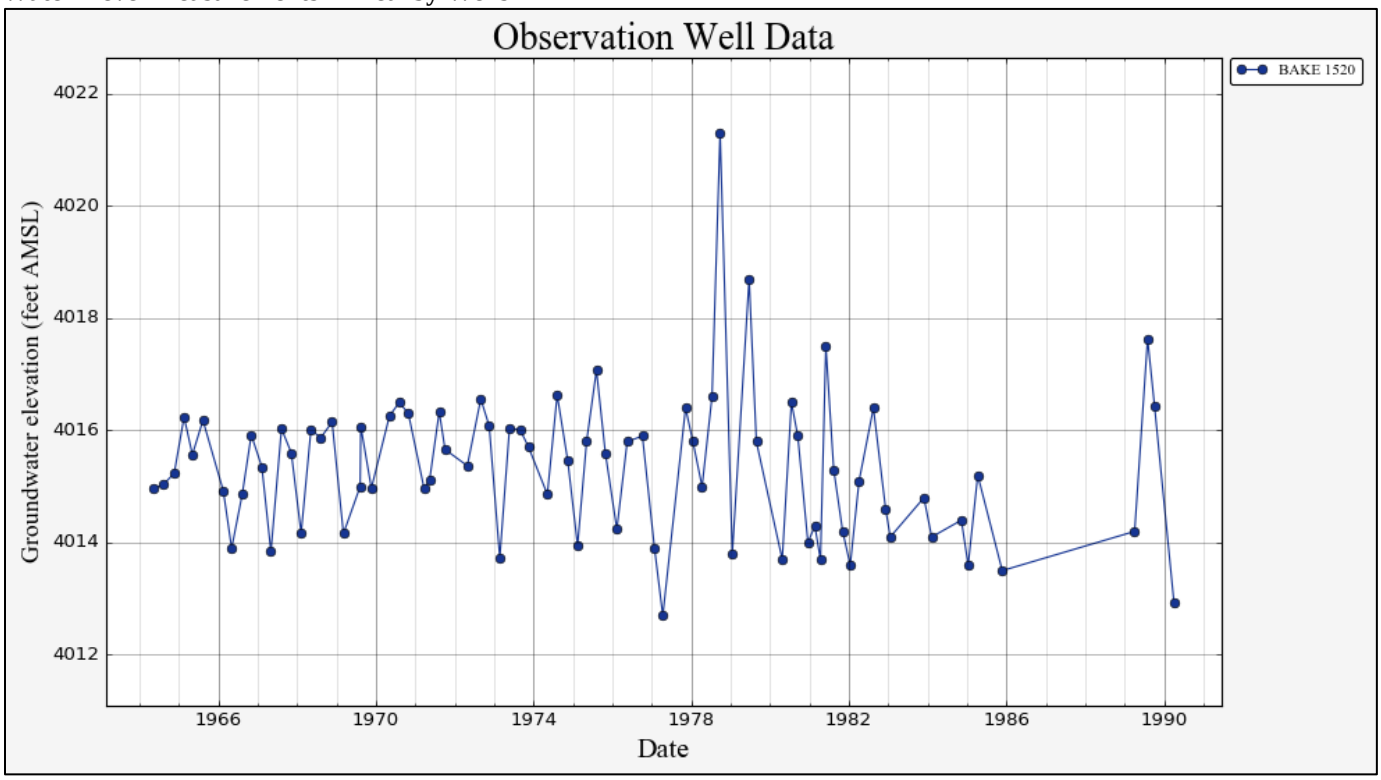
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	0.22	0.21	0.01	0.00	0.00	0.01
FEB	0.58	0.40	0.18	0.00	0.00	0.18
MAR	0.88	2.64	-1.76	0.00	0.00	-1.76
APR	2.30	9.46	-7.16	0.00	0.00	-7.16
MAY	2.35	22.30	-19.90	0.00	0.00	-19.90
JUN	1.49	17.90	-16.50	0.00	0.00	-16.50
JUL	0.29	5.93	-5.64	0.00	0.00	-5.64
AUG	0.11	2.40	-2.29	0.00	0.00	-2.29
SEP	0.08	1.27	-1.19	0.00	0.00	-1.19
OCT	0.08	0.08	0.00	0.00	0.00	0.00
NOV	0.14	0.10	0.04	0.00	0.00	0.04
DEC	0.16	0.13	0.03	0.00	0.00	0.03
ANN	1,140	3,810	136	0	0	136

Well Location Map



Water-Level Measurements in Nearby Wells



Measurements of nearby State Observation Well BAKE 1520 were discontinued in 1990, but during the period of record displayed reasonably stable water levels.