Groundwater Application Review Summary Form

Application # G- 19361

GW Reviewer Phillip I. Marcy Date Review Completed: 04/20/2023

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 **_April 20, 2023_**

TO: **Application** G-**_19361_**

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 04/20/2023
FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name
SUBJECT: Application G- **19361** 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: **Baker Valley Farms Holdings, LLC** County: **Baker**

A1. Applicant(s) seek(s) 0.88 cfs from 3 well(s) in the Powder Basin, subbasin

A2. Proposed use Irrigation (70.5 acres) Seasonality: March 1st – October 31st (245 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	BAKE 52513	1	Basalt	0.88	9S/40E-23 NE-NW	1050'S, 1600'E fr NW cor S 23
2	Proposed	2	Basalt	0.88	9S/40E-14 NE-SW	2190'N, 1555'E fr SW cor S 14
3	Proposed	3	Basalt	0.88	9S/40E-15 SE-NE	3800'N, 1105'W fr SE cor S 15
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	3562	627	125.50	03/30/2023	705	0-528	0-528	NA	NA	1500	NA	Air
2	3537	NA	NA	NA	700	0-550	+2-550*	Unknown	550-700	NA	NA	NA
3	3475	NA	NA	NA	700	0-550	+2-550*	Unknown	550-700	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** POA wells proposed on this application are also proposed on application G-18070 and authorized under Permit G-17563. Only one of the three wells (Well 1) has been constructed. The proposed rate herein of 0.88 CFS will be combined with the previously authorized rate of 6.68 CFS for a total of 7.56 CFS when calculating projected impacts for injury and stream depletion assessments.

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) **7N, 7T, "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 aquifer cannot be determined to be over-appropriated because only a fraction of the pumping authorized under permit G-17563 has been developed. Though the water level data from POA 1 (BAKE 52513) are representative of current conditions within the target aquifer, the response of the target aquifer to the volume of authorized pumping cannot be assessed at this point. The existing authorization is quite large (6.68 CFS), and it cannot be determined whether the full volume of that appropriation is sustainable. Therefore, it appears unwise to allocate more pumping from wells that have yet to be developed.

The application proposes to produce water from basalts, estimating a depth of 500 feet. The few well logs in the area that penetrate the volcanic aquifer system encountered volcanic rock near 700 feet. Little is known about the capacity of the local volcanic aquifer, and it is possible that current levels of withdrawal nearly equal the rate of annual recharge (Trauger, 1951). Therefore, the ongoing development of this groundwater reservoir should be approached with caution.

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	**Basalt (Powder River Volcanics)**	☒	☐
2	**Basalt (Powder River Volcanics)**	☒	☐
3	**Basalt (Powder River Volcanics)**	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: Static water levels of wells completed within the local basalt aquifer system are significantly higher than the water-bearing zones at which water was encountered. Two 740 foot deep wells in this section, located within 500 feet of the proposed location for "Well 3" on this application, encounter basalt at 700 feet. Stated water levels at these wells are less than 20 feet below land surface, and stated yields are 1500 GPM (BAKE 1080) and 2200 GPM (BAKE 1079). According to Trauger (1951), these wells produce water from Tertiary volcanic and sedimentary rocks on the northward dipping limb of an anticline. Completion of POA Well 1 (BAKE 52513) has provided further evidence toward high yielding wells, in addition to high degrees of confinement within the target aquifer for Wells 2 and 3.

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**	**Powder River**	**3442**	**3420**	**11500**	☐	☒	☐	☐	☒
2	**1**	**Powder River**	**~3442**	**3420**	**11420**	☐	☒	☐	☐	☒
3	**1**	**Powder River**	**~3442**	**3420**	**8800**	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The volcanic aquifer here appears to be buried beneath about 700 feet of alluvium, and connection to surface waters is likely tortuous and inefficient. Little information is available concerning the physical properties of the volcanic aquifer system, but assuming the character is similar to regional basalt aquifers of the Columbia Plateau, groundwater would migrate much more quickly horizontally than vertically, dispersing impacts to surface water out beyond one mile.

Water Availability Basin the well(s) are located within: POWDER R > SNAKE R – AB UNN STREAM (72191)

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: This section does not apply.

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: This section does not apply.

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:** If a permit is issued, the following special conditions shall apply:

1. The wells shall be constructed to produce only from the volcanic aquifer beneath the valley-fill alluvium, the top of which typically occurs at a depth of 600-900 feet below land surface in this area.
2. Each well shall be continuously cased and continuously sealed at least 10 feet into volcanic rock.
3. The open interval below the casing shall extend no more than 200 feet into the volcanic aquifer. However, a larger open interval may be approved by the Department if the applicant can demonstrate to the satisfaction of the Department that each well is only open to a single aquifer. Substantial evidence of a single aquifer completion may be collected by video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods approved by the Department. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval.
4. Whenever possible, drill cuttings shall be collected at 10-foot intervals and at changes in formation in the well and a split of each sampled interval shall be provided to the Department.
5. For each well drilled under this permit, a constant-rate aquifer test shall be conducted to determine aquifer properties and to assess the potential impacts from use of the well **before beneficial use begins**. The test shall be designed and conducted by an Oregon Registered Geologist and the test design shall be subject to the approval of the Groundwater Section of the Department prior to the test. At a minimum, the test shall include discharge and water-level measurements in the pumping well and simultaneous water-level measurements in all other wells drilled under this water right. Pumping duration for the test shall be determined by the Department after well yield and specific capacity are determined. The requirement for a constant-rate aquifer test on each well may be waived if a multiple-well aquifer test is performed involving all permitted wells on this water right within five years of the date of permit issuance. The results of each aquifer test shall be presented in a report to the Department that includes an analysis of aquifer properties, aquifer boundaries, and the potential impact on nearby wells that is likely to occur over the duration of an irrigation season if the well is used at the licensed rate and duty.
6. Copies of all geologic and hydrogeologic reports completed for the permittee during the development of the well, including geophysical well logs and borehole video logs, shall be provided to the Department. Except for borehole video logs, two paper copies, or a single electronic copy, shall be provided of each report. Digital tables of any data shall be provided upon request.

References Used:

Trauger, F.D. (1951). Ground-Water Resources of Baker Valley, Baker County, Oregon. Portland, Oregon: United States Geological Survey

Brooks, H.C., McIntyre, J.R., and Walker, G.W. Geologic Map of the Oregon Part of the Baker 1 degree by 2 degree Quadrangle/GMS 7. Scale 1:250,000. State of Oregon Department of Geology and Mineral Industries, 1976.

Local Well Logs, GWIS water level database

Application file G-19361, application review G-18070.

Iverson, J.I. 2023, Clarification of current policy for determining over-appropriation in section B1a of the PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

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

BALDOCK SL > POWDER R - AT MOUTH

Watershed ID #: 30920330 Basin: POWDER Exceedance Level: 80

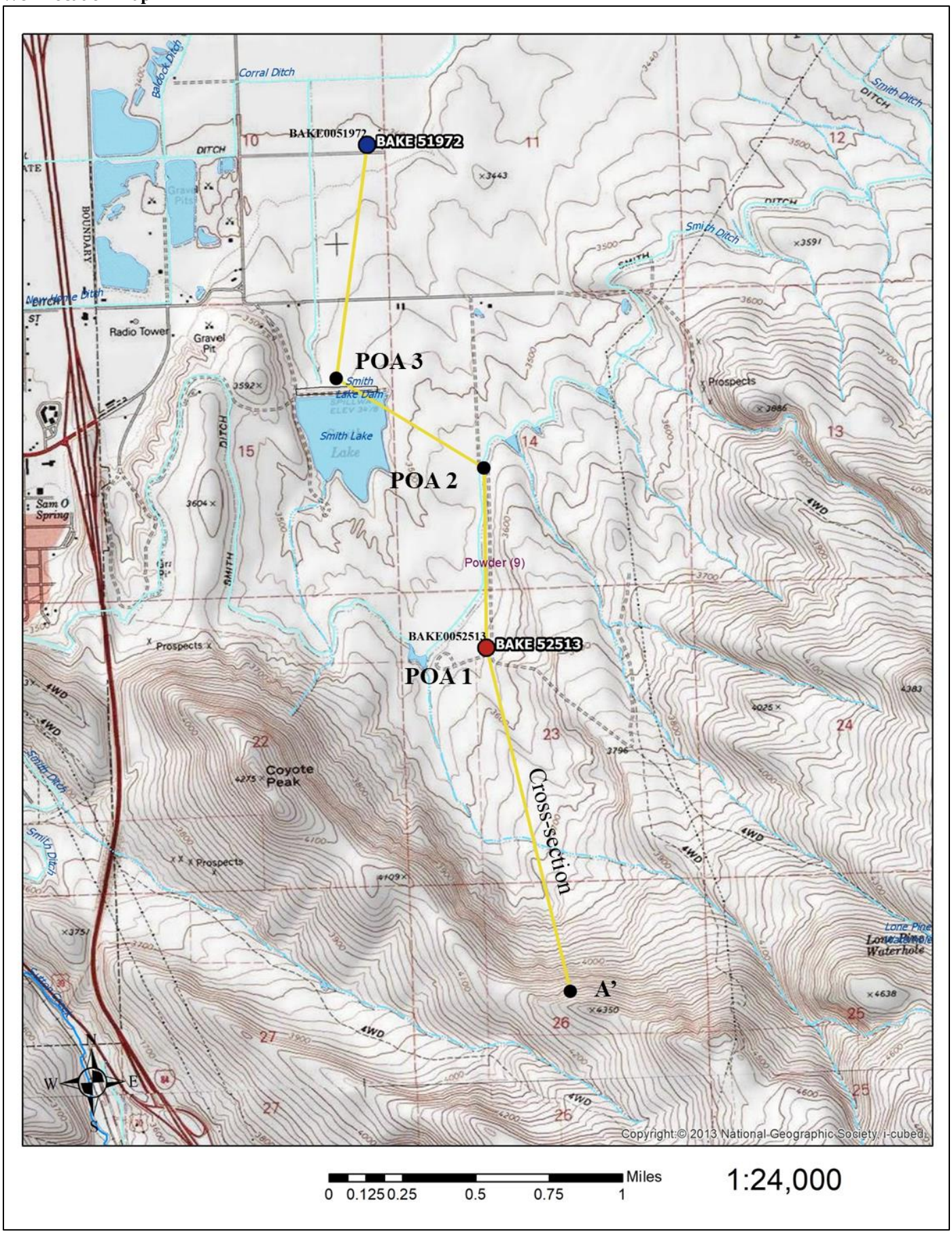
Time: 5:41 PM Date: 04/19/2023

Monthly values are in cfs.

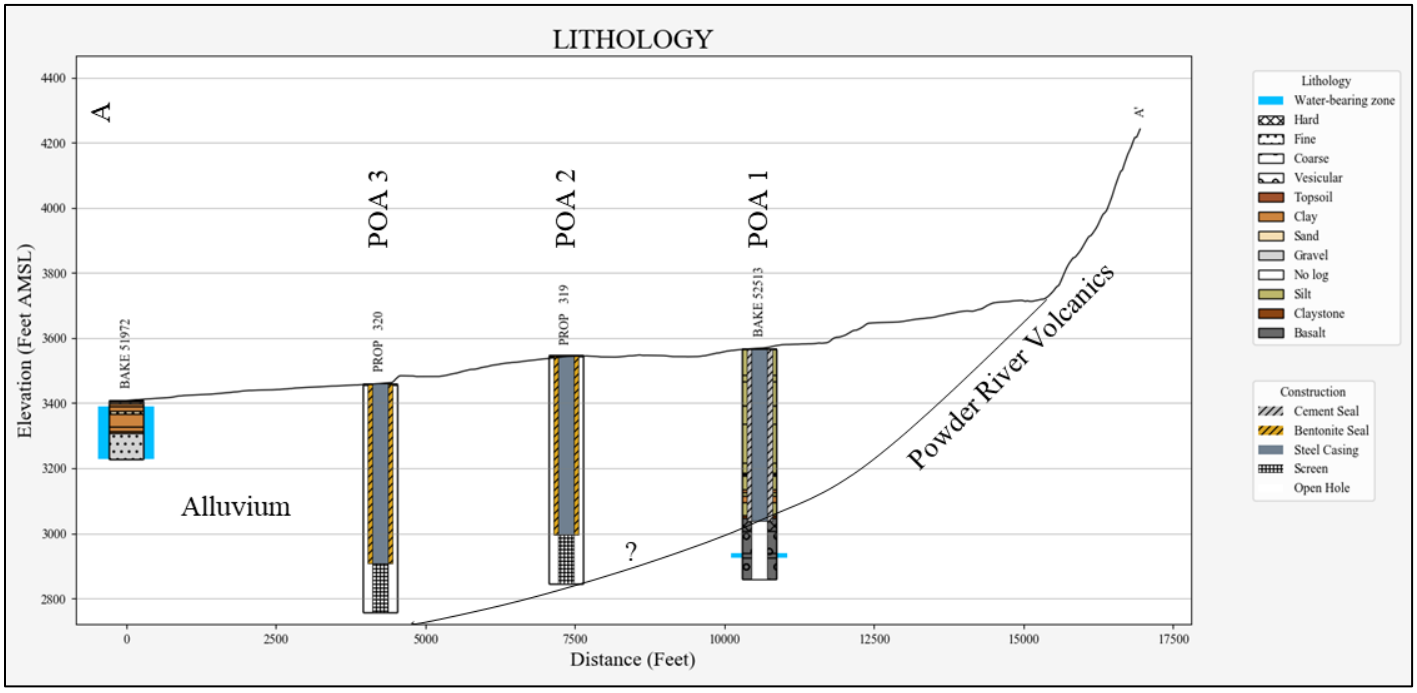
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	0.58	0.24	0.34	0.00	0.00	0.34
FEB	2.18	0.24	1.94	0.00	0.00	1.94
MAR	4.32	0.28	4.04	0.00	0.00	4.04
APR	10.90	3.12	7.78	0.00	0.00	7.78
MAY	3.49	4.70	-1.21	0.00	0.00	-1.21
JUN	0.75	5.31	-4.56	0.00	0.00	-4.56
JUL	0.17	3.02	-2.85	0.00	0.00	-2.85
AUG	0.07	1.30	-1.23	0.00	0.00	-1.23
SEP	0.06	0.83	-0.77	0.00	0.00	-0.77
OCT	0.06	0.49	-0.43	0.00	0.00	-0.43
NOV	0.17	0.24	-0.07	0.00	0.00	-0.07
DEC	0.35	0.24	0.11	0.00	0.00	0.11
ANN	3,770	1,210	3,090	0	0	3,090

Well Location Map



Cross-Section



Water-Level Measurements in Nearby Wells