Groundwater Application Review Summary Form

Application # G- 19337

GW Reviewer Darrick E. Boschmann Date Review Completed: 08/11/2023

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 **_08/11/2023_**

TO: **Application** G-**_19337_**

FROM: **GW:** **_Darrick E. Boschmann_**
(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 08/11/2023
FROM: Groundwater Section Darrick E. Boschmann
Reviewer's Name
SUBJECT: Application G- **19337** Supersedes review of N/A
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: **Ryan Kiely** County: **Lake**

A1. Applicant(s) seek(s) 8.91 cfs from 2 well(s) in the Goose and Summer Lakes Basin, Warner Lakes subbasin

A2. Proposed use 94.8 acres primary irrigation; 275.5 acres supplemental irrigation Seasonality: Irrigation season

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	LAKE 1881/1882	1	Basalt and tuffaceous sediments	8.91 (3999 gpm)	36.00S-24.00E-32-NE NE	100 FEET SOUTH AND 100 FEET WEST FROM NE CORNER, SECTION 32
2	Proposed	2	Basalt and tuffaceous sediments	8.91 (3999 gpm)	36.00S-24.00E-32-SE SE	5200 FEET SOUTH AND 100 FEET WEST FROM NE CORNER, SECTION 32
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	4500	216	23.7	01/15/1981	340	0-18	+2-58.5	None	None	200*	-	Air
2	4475	-	-	-	340	0-18	+2-58.5	None	None	-	-	-

Use data from application for proposed wells.

A4. **Comments:**

The proposed wells are located in the Crump Lake watershed just south of Plush, Oregon. The area underlying the proposed wells was mapped by Walker and Repenning (1965) as QTs (sedimentary deposits; lacustrine gravels), which is likely underlain at this location by Tb (basalt flows) and Tts (tuffaceous sedimentary rocks). The well logs for LAKE 1881/LAKE 1882 describe interbedded lava/basalt and sedimentary rocks and deposits, which is consistent with the mapping of Walker and Repenning, 1965.

*Note: this air test is from the original well log LAKE 1881; no pump/air test was reported on the deepening log LAKE 1882.

A5. ☐ **Provisions of the** Goose and Summer Lakes 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 690-513-0040 (Warner Lake Subbasin) does not apply

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: Currently no administrative area.

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 nearest current State Observation Well, LAKE 1886 is located approximately 0.5 miles east of proposed well 1 (LAKE 1881). This well is 262 feet deep, is completed in lava and cinders, and has a water level record from 1962 to 2023. The water level record for this well indicates approximately 6.5 feet of total decline since 1986. Between 2020 and 2023 the water level record for this well indicates approximately 3.5 feet of decline, a decline rate of over 1 foot per year. 2023 is the lowest March measurement on record for this well.

Approximately 2.5 miles to the north, two additional wells with reported water level data are present in this area: LAKE 1840 and LAKE 52568. Both wells develop groundwater from basalt and tuffaceous sediments. The water level record for both wells depicts a parallel water level decline trend with LAKE 1886 since 2020 of approximately 1 foot per year.

The available water level record does not meet the Division 8 definition of excessively declining or declined excessively (for the storage portion of the source of water to wells).

Even with the rate of decline occurring in this area it is not likely that any interference with nearby wells would meet the standard for substantial or undue interference.

There is a long-term trend of declining water levels in this area since the late 1980s, and an increased rate of decline since 2000. Additional groundwater development in this area will likely contribute to existing declines which could impair the function of the aquifer by precluding its perpetual use. Therefore, the new use is found to be not within the capacity of the resource as defined in OAR 690-400-0010.

If a permit is issued the following conditions are recommended:

- 7N
- Large water use reporting

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 and tuffaceous sediments	☐	☒
2	Basalt and tuffaceous sediments	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation:

The groundwater system is identified as generally unconfined with discontinuous low permeability layers causing local (discontinuous, limited) confinement. Generally, a lower transmissivity basin fill unit overlies a higher transmissivity volcanic rocks and sediment unit. Groundwater occurs in both the basin fill and volcanic rocks and sediment unit, and groundwater is vertically connected within each unit and between each unit. Sammel and Craig (1981) note that groundwater within the deeper rocks is hydraulically connected to the overlying basin fill deposits.

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**	**Honey Creek**	**4476**	**4506**	**3200**	☒	☐	☐	☐	☒
1	**1**	**Honey Creek**	**4476**	**4506**	**8300**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:

Available reports indicate groundwater and surface water are connected in the Warner Lake Valley.

The GW elevations cited above are from the 1981 measurement from LAKE 1881.

Water Availability Basin the well(s) are located within: No WAB data available for well locations. Honey Creek is located within HONEY CR > HART L – 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	**1**	☐	☒	**IS89316A**	**2.67**	☒	**2.07**	☒	*	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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. Qw is greater than 1% of the ISWR for Well 1 and SW 1. Qw is greater than 1% of the 80% natural flow for Well 1 and SW 1. *Interference at 30 days not calculated due to triggering of PSI under other criteria.

C3b. No distributed rate requested.

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**	**0.01 %**	**0.02 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**
Well Q as CFS		**0**	**0**	**8.91**	**8.91**	**8.91**	**8.91**	**8.91**	**8.91**	**8.91**	**8.91**	**0**	**0**
Interference CFS		**.001**	**.002**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(A) = Total Interf.	**.001**	**.002**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
(B) = 80 % Nat. Q	**5.06**	**6.64**	**12.60**	**41.50**	**53.80**	**26.80**	**4.32**	**2.27**	**2.07**	**2.14**	**3.01**	**3.74**
(C) = 1 % Nat. Q	**0.0506**	**0.0664**	**0.126**	**0.415**	**0.538**	**0.268**	**0.0432**	**0.0227**	**0.0207**	**0.0214**	**0.0301**	**0.0374**
(D) = (A) > (C)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100	**0.019**	**0.03**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

(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:

Stream depletion between Well 2 and SW 1 was estimated using Hunt (2003) and a range of parameter values representative of the geologic conditions present in the area. Interference is less than 1% of the 80% natural flow in all months, even at the full proposed pumping rate of 8.91 cfs.

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:**

C1. 690-09-040 (1)
It is determined that all wells will produce water from an unconfined aquifer.

C2. 690-09-040 (2) (3)
It is determined that all wells are hydraulically connected with the Honey Creek.

C3a./C3b. 690-09-040 (4)
PSI is assumed for well 1 and SW 1. Qw is greater than 1% of the ISWR and 1% of the 80% natural flow.

C4a. 690-09-040 (5)
PSI cannot be assumed for Well 2 and SW 1.

References Used:

Walker, G.W., Repenning, C.A., 1965. Reconnaissance geologic map of the Adel quadrangle, Lake, Harney, and Malheur Counties, Oregon. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-446. Scale 1:250,000.

Sammel, E., A., Craig, R.W., 1981. The geothermal hydrology of Warner Valley, Oregon: a reconnaissance study. U.S. Geological Survey Professional Paper 1044-I.

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

HONEY CR > HART L - AT MOUTH

Watershed ID #: 31300713 Basin: GOOSE & SUMMER LAKE Exceedance Level: 80

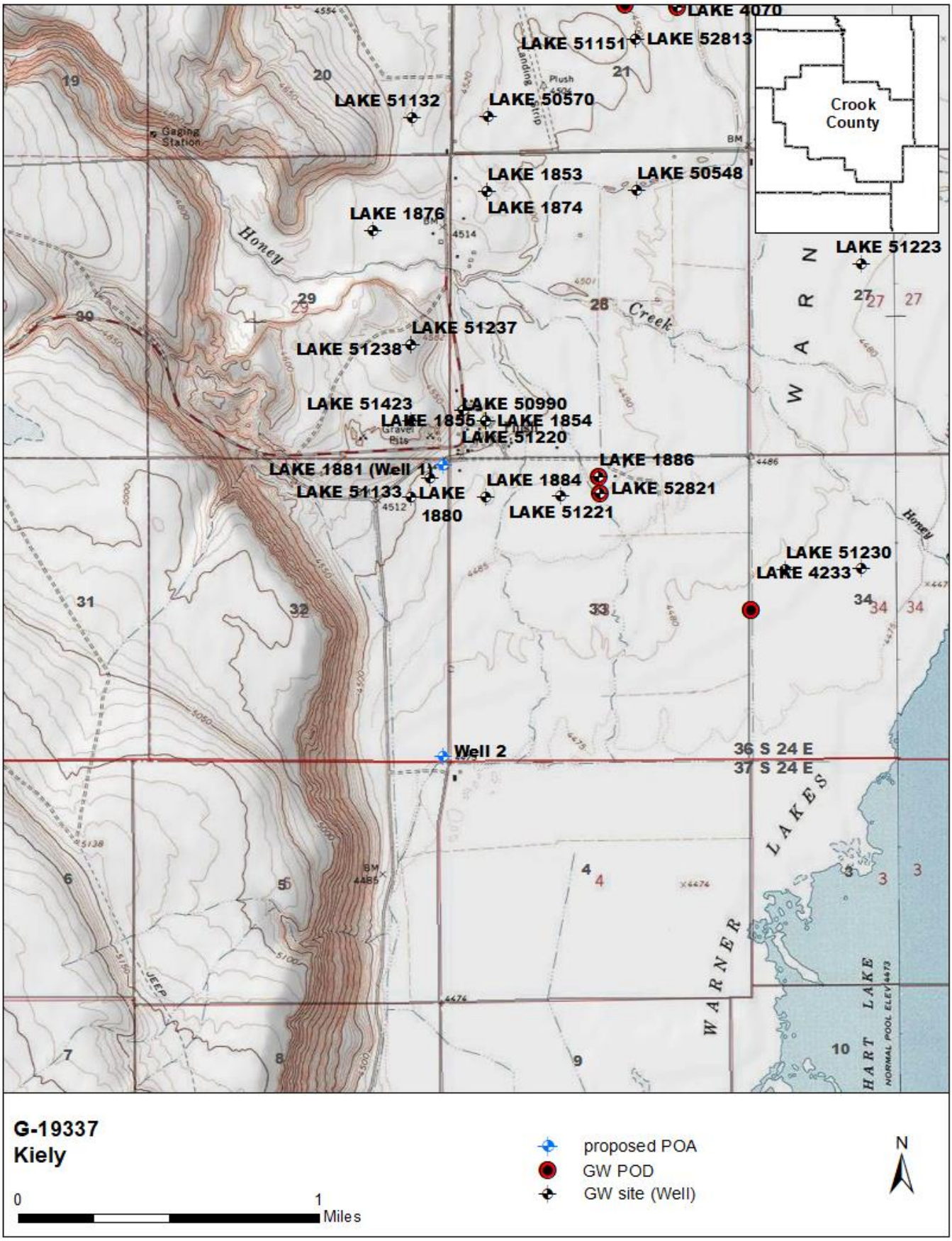
Time: 11:18 AM Date: 08/11/2023

Monthly values are in cfs.

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

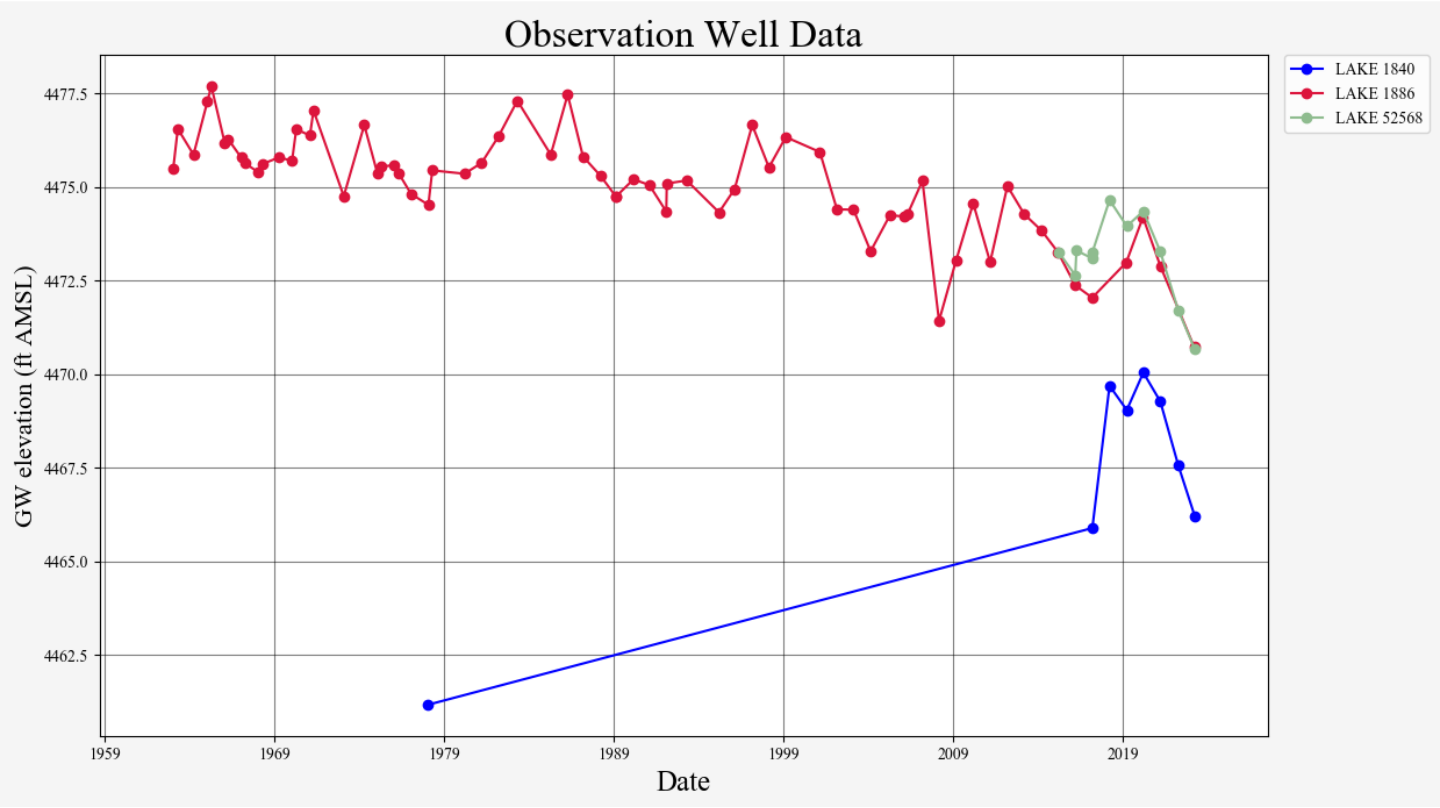
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	5.06	0.21	4.85	0.00	5.00	-0.15
FEB	6.64	0.33	6.32	0.00	12.40	-6.08
MAR	12.60	2.06	10.50	0.00	15.00	-4.46
APR	41.50	8.36	33.10	0.00	30.00	3.14
MAY	53.80	20.20	33.60	0.00	30.00	3.64
JUN	26.80	15.50	11.30	0.00	20.00	-8.73
JUL	4.32	4.32	0.00	0.00	5.00	-5.00
AUG	2.27	2.23	0.04	0.00	2.67	-2.63
SEP	2.07	2.01	0.06	0.00	2.67	-2.61
OCT	2.14	1.29	0.85	0.00	3.54	-2.69
NOV	3.01	0.14	2.87	0.00	5.00	-2.13
DEC	3.74	0.19	3.55	0.00	5.00	-1.45
ANN	18,800	3,440	15,400	0	8,200	7,650

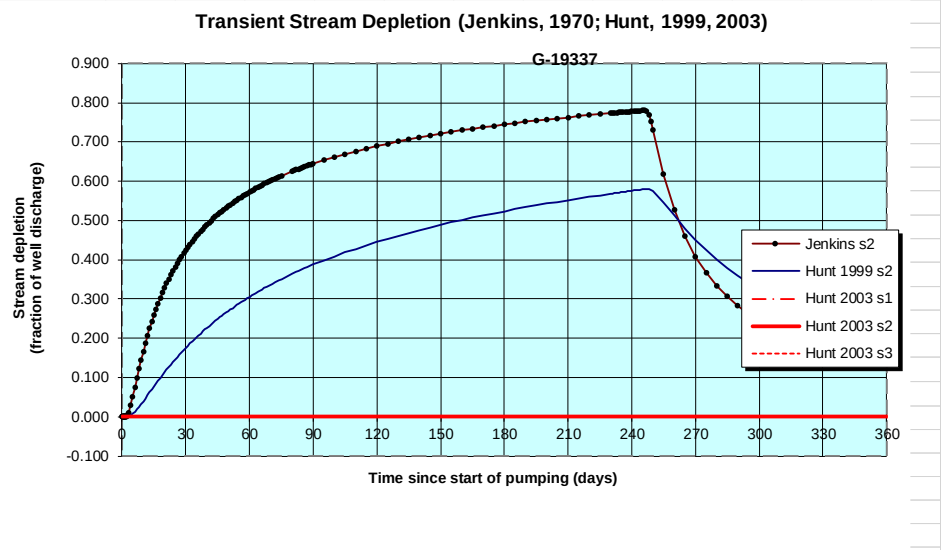
Well Location Map



Water-Level Measurements in Nearby Wells

January-April measurements





Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 245 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	42.4%	57.2%	64.5%	69.0%	72.1%	74.4%	76.3%	77.8%	40.8%	24.5%	17.5%	13.4%
H SD 1999	17.6%	30.5%	38.7%	44.5%	48.9%	52.4%	55.2%	57.6%	45.0%	32.5%	25.3%	20.6%
H SD 2003	0.00%	0.00%	0.00%	0.00%	-0.01%	-0.01%	-0.01%	-0.01%	0.00%	0.00%	0.01%	0.02%
Qw, cfs	8.910	8.910	8.910	8.910	8.910	8.910	8.910	8.910	8.910	8.910	8.910	8.910
H SD 99, cfs	1.566	2.721	3.451	3.967	4.357	4.665	4.918	5.129	4.008	2.900	2.257	1.836
H SD 03, cfs	0.000	0.000	0.000	0.000	-0.001	-0.001	-0.001	-0.001	0.000	0.000	0.001	0.002

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	8.91	8.91	8.91	cfs
Time pump on (pumping duration)	tpon	245	245	245	days
Perpendicular from well to stream	a	8300	8300	8300	ft
Well depth	d	340	340	340	ft
Aquifer hydraulic conductivity	K	18	18	18	ft/day
Aquifer saturated thickness	b	100	100	100	ft
Aquifer transmissivity	T	1800	1800	1800	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	1	1	1	ft/day
Aquitard saturated thickness	ba	50	50	50	ft
Aquitard thickness below stream	babs	50	50	50	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	20	20	20	ft
Streambed conductance (lambda)	sbc	0.400000	0.400000	0.400000	ft/day
Stream depletion factor	sdf	38.272222	38.272222	38.272222	days
Streambed factor	sbf	1.844444	1.844444	1.844444	
input #1 for Hunt's Q_4 function	t'	0.026129	0.026129	0.026129	
input #2 for Hunt's Q_4 function	K'	765.444444	765.444444	765.444444	
input #3 for Hunt's Q_4 function	epsilon'	0.005000	0.005000	0.005000	
input #4 for Hunt's Q_4 function	lamda'	1.844444	1.844444	1.844444	