

# Groundwater Application Review Summary Form

Application # G- 19385

GW Reviewer Grayson Fish Date Review Completed: 12/11/2023

## 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

December 11, 2023

TO: Application G- 19385

FROM: GW: Grayson Fish  
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

- ☒ **YES** The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries
- ☐ **NO**
- ☒ **YES** Use the Scenic Waterway Condition (Condition 7J)
- ☐ **NO**
- ☒ 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 Rogue 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
0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083

# PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/11/2023  
 FROM: Groundwater Section Grayson Fish  
 Reviewer's Name  
 SUBJECT: Application G- 19385 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: Deric Chenault County: Jackson

A1. Applicant(s) seek(s) 0.175 cfs from 1 well(s) in the Rogue Basin,  
 \_\_\_\_\_ subbasin

A2. Proposed use Irrigation Seasonality: March 1 to October 31

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	POA 1	Bedrock	0.175	38S/3W-26 NW-SW	1270' N, 780' E fr W1/4 cor S 26
2						

\* 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*	1,788	315	~60	5/12/2020	400	0-18	0-400	--	360-400	--	--	--

Use data from application for proposed wells.

A4. **Comments:** \*POA 1 is a proposed well and not yet constructed. JACK 64424 is a domestic well located on the subject property which the applicant anticipates construction will be similar to the proposed well.  
The proposed POA/POU is located near the town of Ruch, ~6.5 miles south-southwest of the City of Jacksonville, OR. The applicant proposes construct a new well to irrigate 11.2 acres at a maximum rate of 0.175 cfs.

A5. ☒ **Provisions of the** Rogue 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: The Rogue Basin rules contain no such provisions.

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) 7C; 7J; Medium 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): \_\_\_\_\_

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- B3. **Groundwater availability remarks:** The applicant's proposed Well "POA 1" would likely produce groundwater from the fractured bedrock of the Western Hayfork Terrane (Donato, 1995). Water level trends in adjacent OWRD observation wells indicate that aquifer levels respond to both seasonal precipitation and year-to-year precipitation variation. Observation well JACK 56404 located just over one mile of the proposed POA indicates that groundwater levels have declined approximately 35 feet from 2017 to 2023 when comparing first quarter measurements (it should be noted that 2017 was an above average precipitation year). Starting from a near average precipitation year, a decline of approximately 22 feet is observed between 2019 and 2023. Based on these findings and the available data, groundwater in the vicinity of the proposed POA does not meet the definition of excessively declined or excessively declining per OAR 690-008-0001(4) and (6) and does not appear to be over appropriated.

The applicant has requested a maximum rate of 0.175 cfs (78 gpm) from one proposed well. Well reports of wells constructed within TRS 38S/3W-26 show a median well yield of 15 gpm. JACK 64424, a well constructed on the subject property for domestic purposes, indicates a yield of 8 gpm when air tested at the time of construction in May 2020. **Given the expected well yields for the area, it is unlikely that the applicant would be able to achieve the requested rate from the proposed well and the requested rate is likely not within the capacity of the resource.**

The occurrence and magnitude of interference with nearby wells can be difficult to predict in fractured bedrock aquifers. The nearest existing groundwater use are likely exempt wells used for domestic purposes and are located approximately 500 to

1200 feet from the proposed **POA 1**. The Theis equation (1935) is used to estimate maximum well-to-well interference from the proposed POA (78 gpm for 245 days) to a potential well 500 feet away. The resulting drawdown was calculated to be approximately 40 feet or greater indicating interference is likely. However, given the uncertainties introduced when applying the Theis equation to fractured rock aquifers and the variability in degree of interconnectivity of subsurface fractures, a preponderance of evidence does not exist to determine that injury is likely to occur. Permit conditions should be applied as referenced in B1(d)(i) of this review form.

### 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
<b>1</b>	<b>Fractured Bedrock of the Western Hayfork Terrane</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** In fractured-bedrock aquifer systems, water is stored and transmitted primarily by discrete but connected fracture sets. These fractures generally extend to near the surface, so water within these fractures is likely under atmospheric pressure (unconfined) despite an overall low storage coefficient for the aquifer system as a whole and static water levels often reported above water-bearing zones on driller's logs.

#### 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
<b>1</b>	<b>1</b>	<b>Forest Creek</b>	<b>~1,720</b>	<b>1,525</b>	<b>3,575</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>1</b>	<b>2</b>	<b>Applegate River</b>	<b>~1,720</b>	<b>1,400</b>	<b>9,700</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** Groundwater elevations are higher than adjacent surface water sources, indicating that groundwater is flowing towards and discharging to streams. Additionally, there are multiple mapped and permitted springs in the vicinity indicating that groundwater is discharging to the surface. Deeper groundwater flow paths also likely discharge to the Applegate River.

**Water Availability Basin the well(s) are located within:** FOREST CREEK > APPLGATE R – AT MOUTH; impacts also considered for APPLGATE R> ROGUE R – AB JOE G

#### 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?
<b>1</b>	<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<b>IS71614A</b>	<b>0.10</b>	<input checked="" type="checkbox"/>	<b>0.01</b>	<input checked="" type="checkbox"/>	<b>&lt;25%</b>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

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 #		Q <sub>w</sub> > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q <sub>w</sub> > 1% ISWR?	80% Natural Flow (cfs)	Q <sub>w</sub> > 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"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

**Comments:** Stream depletion is estimated using the Hunt (1999) analytical model using bulk aquifer parameters representative of local geology.

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 analysis was not completed as the proposed rate (0.175 cfs) is less than 1% the adopted minimum streamflow for the Applegate River (1% of 38.4 cfs or 0.348).

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:
- ☐ The permit should contain condition #(s) \_\_\_\_\_;
  - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** The applicant's POA would produce water from an unconfined aquifer that is found to be hydraulically connected to Forest Creek and to the Applegate River. **The proposed rate (0.175 or 78 gpm) is greater than 1% of the adopted minimum streamflow (1% 0.01 cfs or 0.0001 cfs) and is greater than 1% of the adjacent instream water right (1% of 0.10 cfs). These metrics result in the assumption of PSI as per OAR 690-009. It is likely unfeasible to achieve a pumping rate that would avoid the finding of PSI (0.044 gpm).**

#### References Used:

Donato, M.M., 1995, Preliminary geologic map of part of the Ruch quadrangle, Jackson County, Oregon: U.S. Geological Survey, Open-File Report OF-95-640, scale 1:24,000

Hunt, B. 1999. Unsteady Steam Depletion from Groundwater Pumping. Journal of Hydrologic Engineering, Vol 8(1) pp 12-19

OWRD Groundwater Information System Database – Accessed 12/11/2023

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, Am. Geophys. Union Trans., vol. 16, pp. 519-524.

**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****Water Availability Analysis  
Detailed Reports**FOREST CR > APPLGATE R - AT MOUTH  
ROGUE BASIN

Water Availability as of 12/11/2023

Watershed ID #: 71614 ([Map](#))

Date: 12/11/2023

Exceedance Level: 80% ▾

Time: 1:23 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	3.47	0.04	3.43	0.00	9.39	-5.96
FEB	6.24	0.12	6.12	0.00	12.00	-5.88
MAR	7.45	0.06	7.39	0.00	12.00	-4.61
APR	7.02	0.34	6.68	0.00	11.30	-4.62
MAY	5.73	0.54	5.19	0.00	8.19	-3.00
JUN	2.04	0.75	1.29	0.00	5.40	-4.11
JUL	0.13	0.99	-0.86	0.00	0.92	-1.78
AUG	0.25	0.82	-0.57	0.00	0.12	-0.69
SEP	0.01	0.55	-0.54	0.00	0.10	-0.64
OCT	0.09	0.19	-0.10	0.00	0.82	-0.92
NOV	1.25	0.03	1.22	0.00	2.63	-1.41
DEC	2.46	0.03	2.43	0.00	5.66	-3.23
ANN	4,720.00	269.00	4,520.00	0.00	4,110.00	596.00



# Water Availability Analysis

## Detailed Reports

APPLEGATE R > ROGUE R - AB JOE G  
ROGUE BASIN

Water Availability as of 12/11/2023

Watershed ID #: 250 [\(Map\)](#)

Exceedance Level: 80%

Date: 12/11/2023

Time: 1:43 PM

Water Availability Calculation

Consumptive Uses and Storages

Instream Flow Requirements

Reservations

Water Rights

Watershed Characteristics

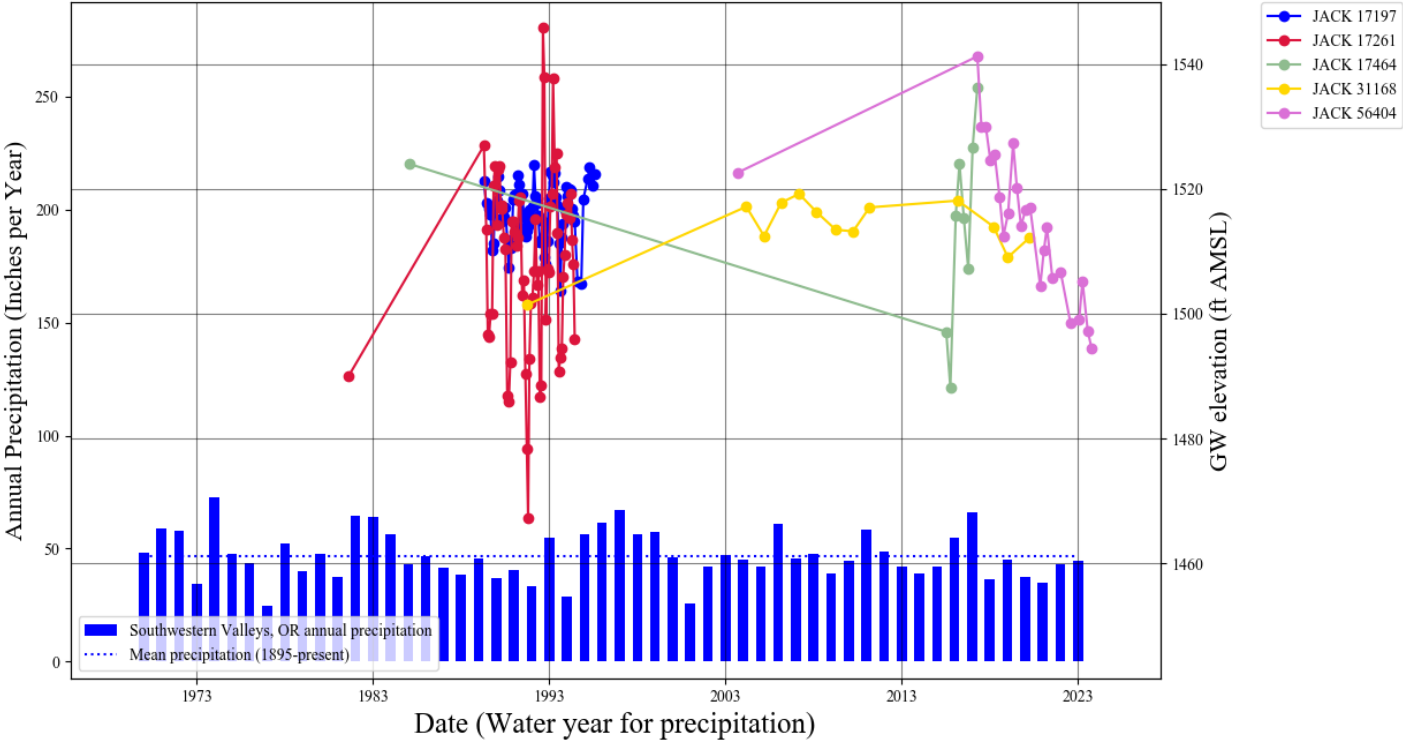
### Water Availability Calculation

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	204.00	2.40	202.00	0.00	200.00	1.60
FEB	378.00	436.00	-57.80	0.00	200.00	-258.00
MAR	463.00	435.00	28.00	0.00	265.00	-237.00
APR	481.00	450.00	30.50	0.00	265.00	-234.00
MAY	469.00	28.10	441.00	0.00	265.00	176.00
JUN	183.00	38.70	144.00	0.00	265.00	-121.00
JUL	70.90	51.40	19.50	0.00	230.00	-211.00
AUG	47.60	42.60	4.97	0.00	200.00	-195.00
SEP	38.40	28.30	10.10	0.00	200.00	-190.00
OCT	41.00	10.10	30.90	0.00	240.00	-209.00
NOV	85.80	1.83	84.00	0.00	240.00	-156.00
DEC	153.00	2.13	151.00	0.00	200.00	-49.10
ANN	279,000.00	90,500.00	188,000.00	0.00	167,000.00	69,500.00

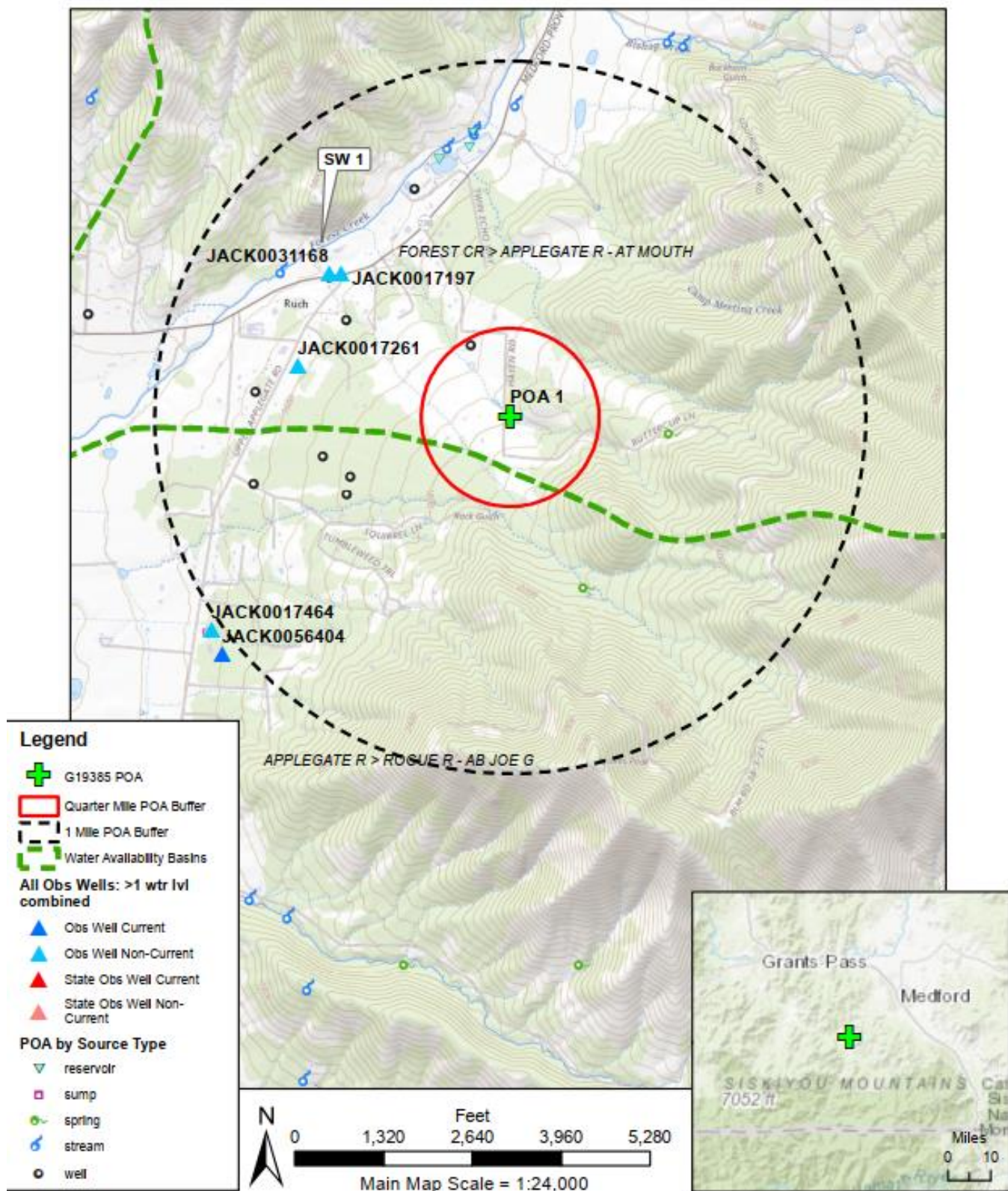
### Water-Level Measurements in Nearby Wells

#### Observation Well Data



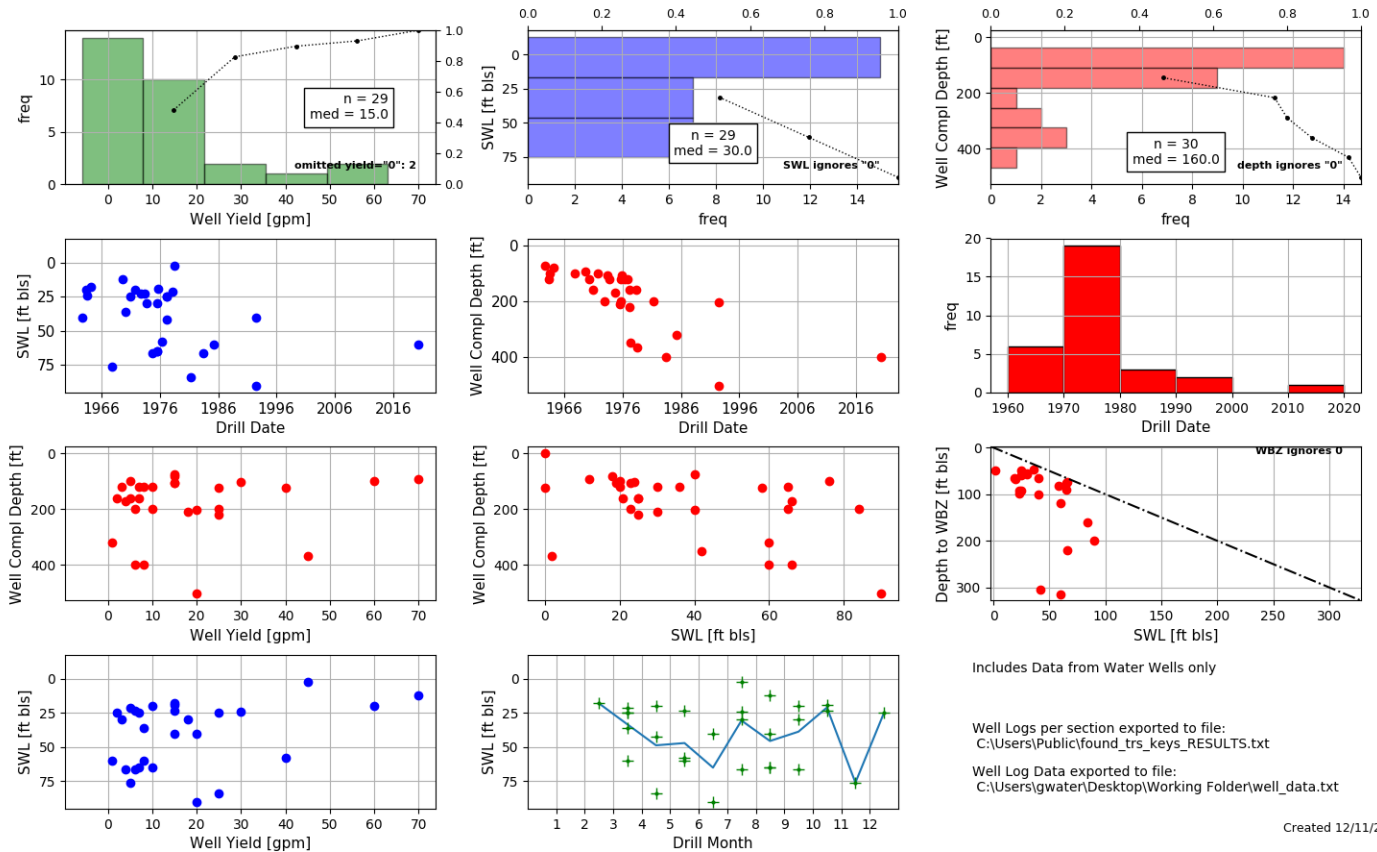
## Well Location Map

**G-19385**



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community  
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State

## Well Statistics in 38S/3W-S26



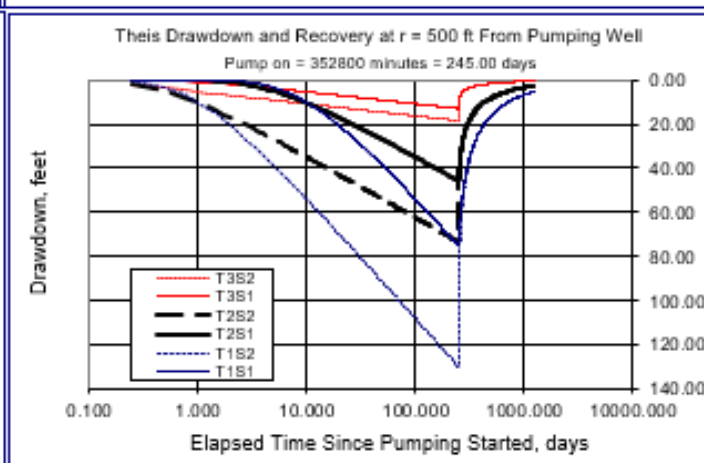
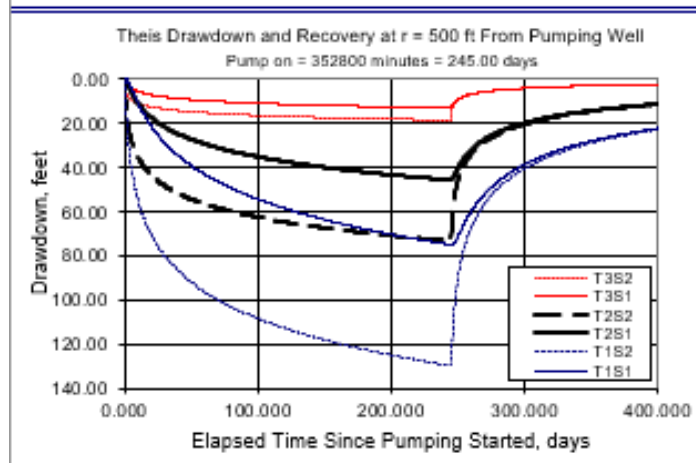
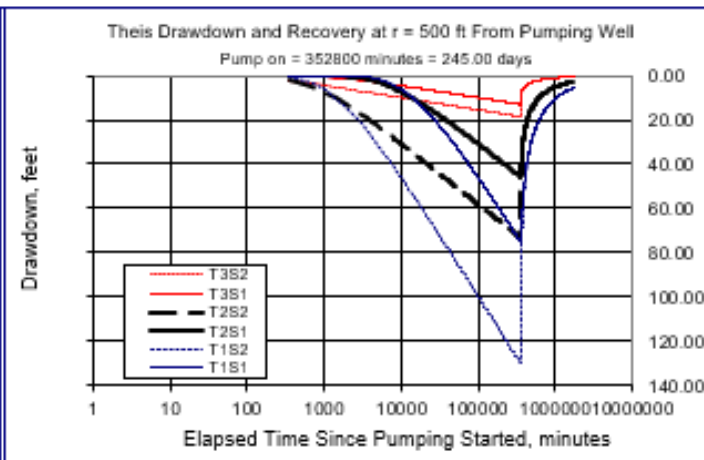
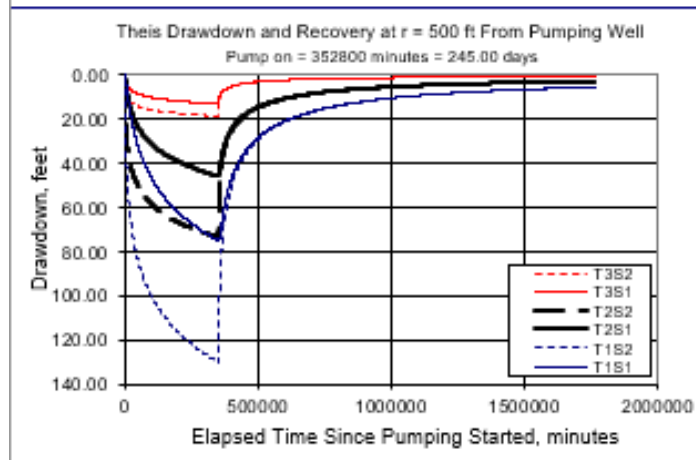
**Theis (1935) Distance Drawdown Modeling Parameters and Results**

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		500		ft	<b>Q conversions</b>
Pumping rate	Q		0.175		cfs	78.54 gpm
Hydraulic conductivity	K	0.5	1	5	ft/day	0.18 cfs
Aquifer thickness	b		100		ft	10.50 cfm
Storativity	S 1		0.005			15,120.00 cfd
	S 2		0.0005			0.35 afd/d
<b>Transmissivity Conversions</b>	T ft2pd	50	100	500	ft2/day	
	T ft2pm	0.0347222	0.0694444	0.3472222	ft2/min	
	T gpd/ft	374	748	3740	gpd/ft	

Recalculate

Use the Recalculate button if recalculation is set to manual





**Hunt (1999) Stream Depletion Model Parameters and Results**

Application type:	G
Application number:	19385
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.175
Pumping duration (days):	244.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3575	3575	3575	ft
Aquifer transmissivity	T	500	100	50	ft <sup>2</sup> /day
Aquifer storativity	S	0.01	0.001	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Not used		0	0	0	
Aquitard thickness below stream	babs	5	4	3	ft
Not used		0	0	0	
Stream width	ws	10	20	30	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270
Depletion (%)	0	29	24	9	22	31	38	43	47	50	53	49
Depletion (cfs)	0.00	0.05	0.04	0.02	0.04	0.05	0.07	0.08	0.08	0.09	0.09	0.09

