

Groundwater Application Review Summary Form

Application # G- 18519 (Re-review)

GW Reviewer Joe Kemper Date Review Completed: 5/9/2019

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).

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 5/9/2019
 FROM: Groundwater Section Joe Kemper
 SUBJECT: Application G- 18519 Reviewer's Name
Supersedes review of 7/17/2018

Date of Review(s)

***This re-reviews the finding of Potential for Substantial Interference with Snider Creek.**

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: David Duddy County: Jackson

A1. Applicant(s) seek(s) 0.29 cfs from 5 well(s) in the Rogue Basin,
Upper Rogue subbasin

A2. Proposed use Nursery (37.7 acres) Seasonality: Year Round

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	JACK 62699	1	Bedrock	0.009*	35S/2W-11 SW-SE	622' N, 1622' W fr SE cor S 11
2	JACK 62698	2	Bedrock	0.009*	35S/2W-11 SW-SE	113' N, 1990' W fr SE cor S 11
3	Proposed	3	Bedrock	0.281*	35S/2W-11 SW-SE	1246' N, 1472' W fr SE cor S 11
4	Proposed	4	Bedrock	0.281*	35S/2W-11 SW-SE	1145' N, 1418' W fr SE cor S 11
5	Proposed	5	Bedrock	0.281*	35S/2W-11 SW-SE	1026' N, 1405' W fr SE cor S 11

* 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	1413	212	40	8/10/2018	240	0-18	0-38	0-240	220-240	45		Air
2	1400	67	26	8/9/2018	200	0-20	0-38.5	0-200	180-200	40		Air
3	1411	NA	NA	NA	NA	NA	NA	NA	NA	NA		
4	1411	NA	NA	NA	NA	NA	NA	NA	NA	NA		
5	1414	NA	NA	NA	NA	NA	NA	NA	NA	NA		

Use data from application for proposed wells.

A4. **Comments:** The reviewer assumes that proposed Wells 3, 4, and 5 will encounter similar geologic and hydraulic conditions as Wells 1 and 2 because the geology of the area is fairly uniform laterally and with depth.

***The amended application requests 0.009 cfs from Wells 1 and 2 (combined pumping rate cannot exceed 0.009 cfs), and 0.281 cfs from Wells 3, 4, and 5 (the combined pumping rate cannot exceed 0.281 cfs).**

A5. ☒ **Provisions of the** Rogue (OAR 690-515) 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 provision.

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 (7-yr SWL); 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): _____

- B3. **Groundwater availability remarks:** The applicant's proposed POAs will be producing from fractured bedrock of the Payne Cliffs Formation. Wells in this aquifer system typically produce less than 50 gpm. There are no current OWRD observation well data within 1 mile of the proposed POA so aquifer over-appropriation cannot be determined. However, a cluster of observation wells accessing the Payne Cliffs Formation 1-2 miles to the east shows relatively stable water levels over the previous 10-20 years (see Figure 3).

There are several valid POAs within 0.5 miles of the applicant's wells, posing the risk of injury to senior water rights. However, adjacent taxlot density (as a proxy for well development) is moderate and the Department is unaware of any historic interference problems. Similarly, the above mentioned cluster of observation wells has similar development density, and water levels do not show systemic decline. As such, it is unlikely that the proposed use at the rate requested will cause injury to adjacent senior users.

The proposed locations for Wells 3, 4, and 5 are very close together. It is noted that this proximity will likely cause well-to-well interference and could inhibit the production of these three wells.

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	Bedrock of Payne Cliffs Fm.	☒	☐
2	Bedrock of Payne Cliffs Fm.	☒	☐
3	Bedrock of Payne Cliffs Fm.	☒	☐
4	Bedrock of Payne Cliffs Fm.	☒	☐
5	Bedrock of Payne Cliffs Fm.	☒	☐

Basis for aquifer confinement evaluation: The well logs for the applicant's wells report "First Water" at 212 feet BLS and 67 feet and a SWL of 40 feet and 26 feet BLS, respectively. Adjacent well logs report similar confined conditions. The reviewer assumes that Wells 3, 4, and 5, when drilled, will encounter similar hydraulic conditions.

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	Snider Creek	1373	1355	4990	☒	☐	☐	☐	☒
2	1	Snider Creek	1374	1355	4530	☒	☐	☐	☐	☒
3	1	Snider Creek	**	1355	5295	☒	☐	☐	☐	☒
4	1	Snider Creek	**	1355	5295	☒	☐	☐	☐	☒
5	1	Snider Creek	**	1355	5290	☒	☐	☐	☐	☒
1	2	Constance Creek	1373	1330	~10000*	☒	☐	☐	☐	☒
2	2	Constance Creek	1374	1330	~10000*	☒	☐	☐	☐	☒
3	2	Constance Creek	**	1330	~11000*	☒	☐	☐	☐	☒
4	2	Constance Creek	**	1330	~10750*	☒	☐	☐	☐	☒
5	2	Constance Creek	**	1330	~10500*	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Observed SWL elevations are higher than perennial stream elevations, indicating that groundwater flows towards and discharges to surface water.

*Distance measured to Constance Creek is to the nearest point where the creek is assumed to be hydraulically connected to the groundwater system based on aerial imagery and OWRD staff site visits.

**Well 3, 4, and 5 are proposed. The reviewer assumes that Wells 3, 4, and 5, when drilled, will encounter similar hydraulic conditions.

Water Availability Basin the well(s) are located within: ROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE 14359000 #270; PSI also evaluated for SNIDER CR > ROGUE R - AT MOUTH #71626

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 source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and 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	☐	☐	IS71626A	0.96	☐	0.90	☐	<1%	☐
2	1	☐	☐	IS71626A	0.96	☐	0.90	☐	<1%	☐

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?
**	1		☐	IS71626A	0.96	☐	0.90	☐	<1%	☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: Pumping effects on adjacent surface water sources are evaluated using the Hunt (2003) stream depletion model with aquifer parameters representative of the local geology. Model parameters and results for the closest well-surface water source combination are presented in Figure 4.

Wells 3, 4, and 5 are not included in section C3a because they are located beyond one mile from Snider Creek where it is considered a surface water source.

In the amended application, the applicant has requested 0.009 cfs from Wells 1 and 2. If both wells can individually and instantaneously pump at 0.009 cfs (i.e., 0.018 cfs total), it will trigger a finding of PSI as per OAR 690-009-040 (4). Permit language must clearly state that the maximum instantaneous rate for Wells 1 and 2 combined cannot exceed 0.009 cfs.

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#	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
5*	1	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%
Well Q as CFS		0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281
Interference CFS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	~0.001	~0.001	~0.001
(A) = Total Interf.		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	~0.001	~0.001	~0.001
(B) = 80 % Nat. Q		8.4	17.2	12.4	8.61	4.44	2.07	1.23	1.04	0.94	0.9	1.01	4.33
(C) = 1 % Nat. Q		0.084	0.172	0.124	0.086	0.044	0.021	0.012	0.010	0.009	0.009	0.010	0.043
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

Non-Distributed Wells													
Well	SW#	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
**	2	-	-	-	-	-	-	-	-	-	-	-	-
Well Q as CFS		0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Interference CFS		-	-	-	-	-	-	-	-	-	-	-	-
(A) = Total Interf.		-	-	-	-	-	-	-	-	-	-	-	-
(B) = 80 % Nat. Q		1130	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130	1130
(C) = 1 % Nat. Q		11	11	11	11	11	11	11	11	11	11	11	11
(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:

*Results from stream depletion modeling (Hunt, 2003) for Well 5 and SW source 1 are shown in Figure 5.

**Impacts on Constance Creek or the Rogue River from the applicant's POAs are not calculated because they would be compared with expected flows calculated from the WAB ROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE. The 80% exceedance flow minimum is 1130 cfs. The total proposed rate (0.29 cfs) is much less than 1% of natural flows (11 cfs). 100% streamflow capture would not trigger an assumption of PSI as per OAR 690-009.

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 proposed POA would produce from an aquifer that has been determined to be hydraulically connected to surface water. Well 1 and Well 2 have a combined rate of 0.009 cfs, which is no greater than 1% of the instream water right (1% of 0.96 cfs) or 1% of the expected natural flows (1% of 0.90 cfs) in Snider Creek. Wells 3, 4, and 5 are located greater than 1 mile from the surface water source, Snider Creek. There is not a preponderance of evidence that the proposed use/rates has the Potential for Substantial Interference (PSI) as per OAR 690-0040(4).

References Used: Hunt, B. 2003. *Unsteady Stream Depletion when Pumping from a Semiconfined Aquifer*. Journal of Hydrologic Engineering. Vol 8(1), pp 12-19

OWRD Groundwater Site Information System Database – Accessed 5/9/2019.

Wiley, T. J., and Hladky, F. R., 1991, Geology and mineral resources of the Boswell Mountain quadrangle, Jackson County, Oregon: Oregon Department of Geology and Mineral Industries Geologic Map Series GMS-70, scale 1:24,000.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

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

- ☐ review of the well log;
- ☐ field inspection by _____;
- ☐ report of CWRE _____;
- ☐ 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.

Figure 1. Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Watershed ID #: 270
Time: 3:43 PMROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE 14359000
Basin: ROGUEExceedance Level: 80
Date: 04/12/2018

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	2,180.00	1,130.00	1,050.00	0.00	1,200.00	-148.00
FEB	2,710.00	2,050.00	665.00	0.00	1,200.00	-535.00
MAR	2,750.00	1,820.00	933.00	0.00	1,200.00	-267.00
APR	2,810.00	1,040.00	1,770.00	0.00	1,200.00	574.00
MAY	2,750.00	368.00	2,380.00	0.00	1,200.00	1,180.00
JUN	1,760.00	343.00	1,420.00	0.00	1,200.00	217.00
JUL	1,330.00	368.00	962.00	0.00	1,200.00	-238.00
AUG	1,160.00	330.00	830.00	0.00	1,200.00	-370.00
SEP	1,130.00	275.00	855.00	0.00	1,200.00	-345.00
OCT	1,160.00	227.00	933.00	0.00	1,200.00	-267.00
NOV	1,370.00	344.00	1,030.00	0.00	1,200.00	-174.00
DEC	1,810.00	562.00	1,250.00	0.00	1,200.00	48.40
ANN	1,900,000	529,000	1,370,000	0	869,000	532,000

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Watershed ID #: 71626
Time: 3:54 PMSNIDER CR > ROGUE R - AT MOUTH
Basin: ROGUEExceedance Level: 80
Date: 04/12/2018

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	8.40	1.80	6.60	0.00	26.00	-19.40
FEB	17.20	2.13	15.10	0.00	26.00	-10.90
MAR	12.40	1.39	11.00	0.00	26.00	-15.00
APR	8.61	0.51	8.10	0.00	11.80	-3.70
MAY	4.44	0.81	3.63	0.00	4.98	-1.35
JUN	2.07	1.13	0.94	0.00	4.92	-3.98
JUL	1.23	1.51	-0.28	0.00	2.58	-2.86
AUG	1.04	1.25	-0.21	0.00	1.60	-1.81
SEP	0.94	0.82	0.12	0.00	0.96	-0.84
OCT	0.90	0.27	0.63	0.00	1.00	-0.37
NOV	1.01	0.18	0.83	0.00	2.55	-1.72
DEC	4.33	0.91	3.42	0.00	14.70	-11.30
ANN	7,760	765	6,990	0	7,390	352

Figure 2. Amended Well Location Map

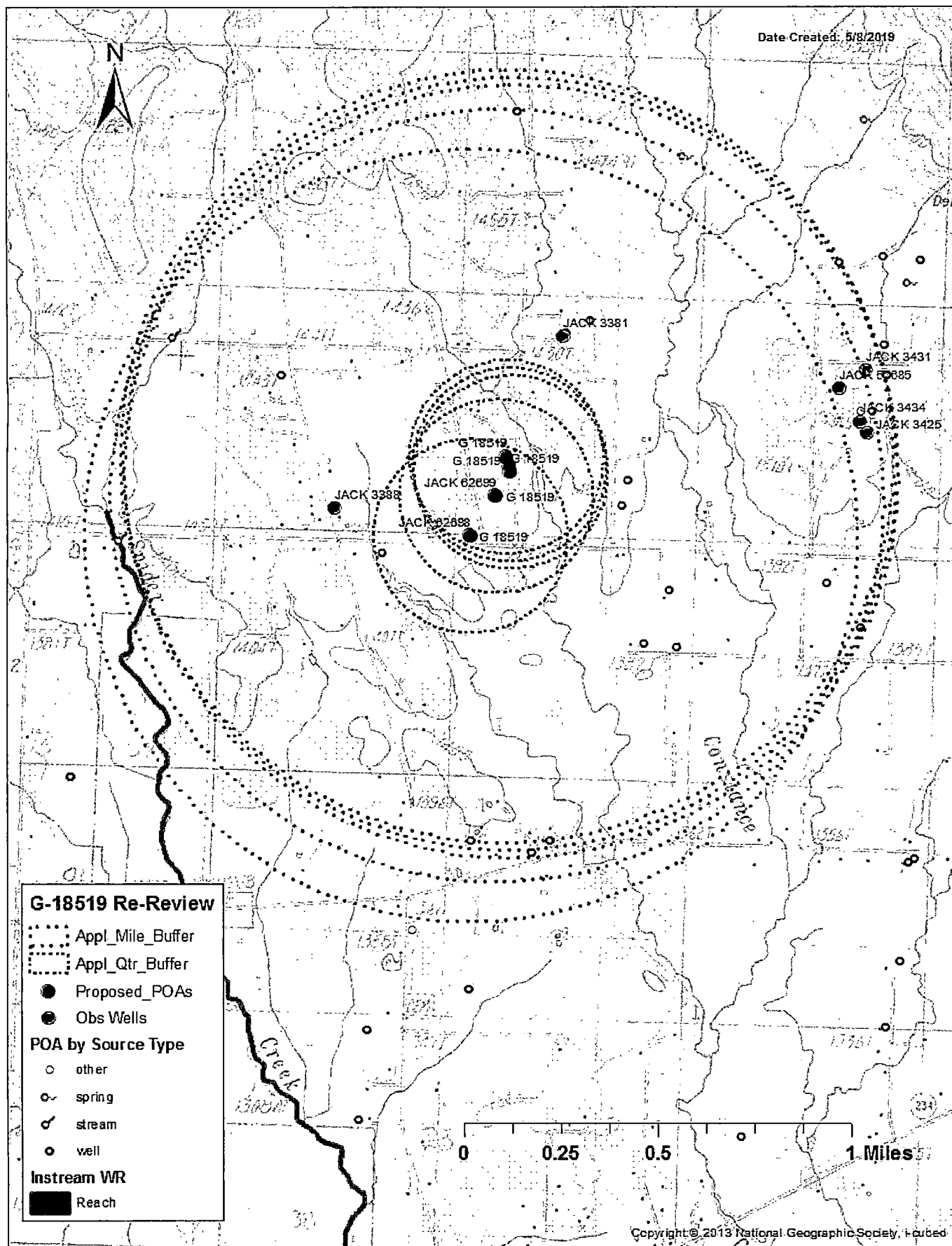


Figure 3. Water-Level Trends in Nearby Wells

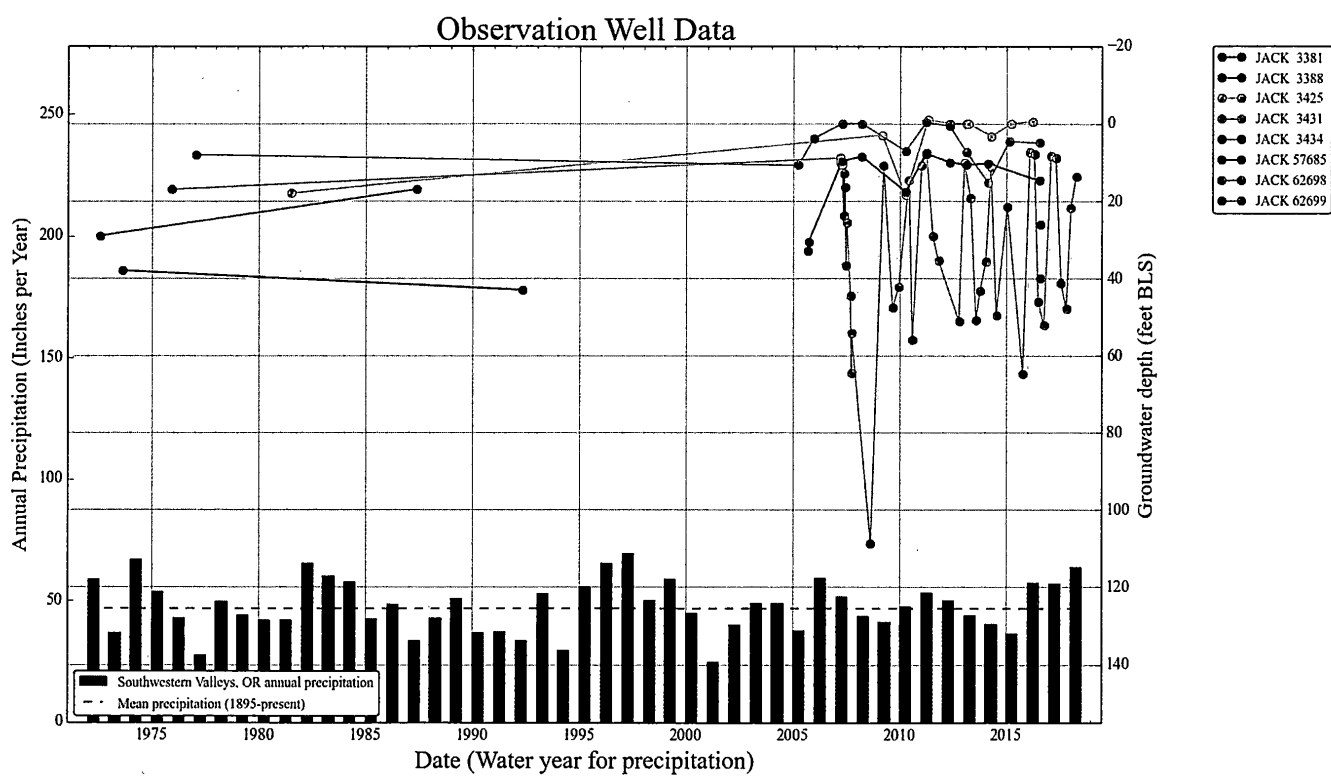


Figure 4. Stream Depletion Model

Application type:	6
Application number:	18519
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.009
Pumping duration (days):	365
Pumping start month number (3=March)	1

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	4530	4530	4530	ft
Aquifer transmissivity	T	1000	2500	5000	ft ² /day
Aquifer storativity	S	0.1	0.05	0.01	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Aquitard saturated thickness	ba	10.0	15	20	ft
Aquitard thickness below stream	babs	4	3	2	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	10	10	10	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	1
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

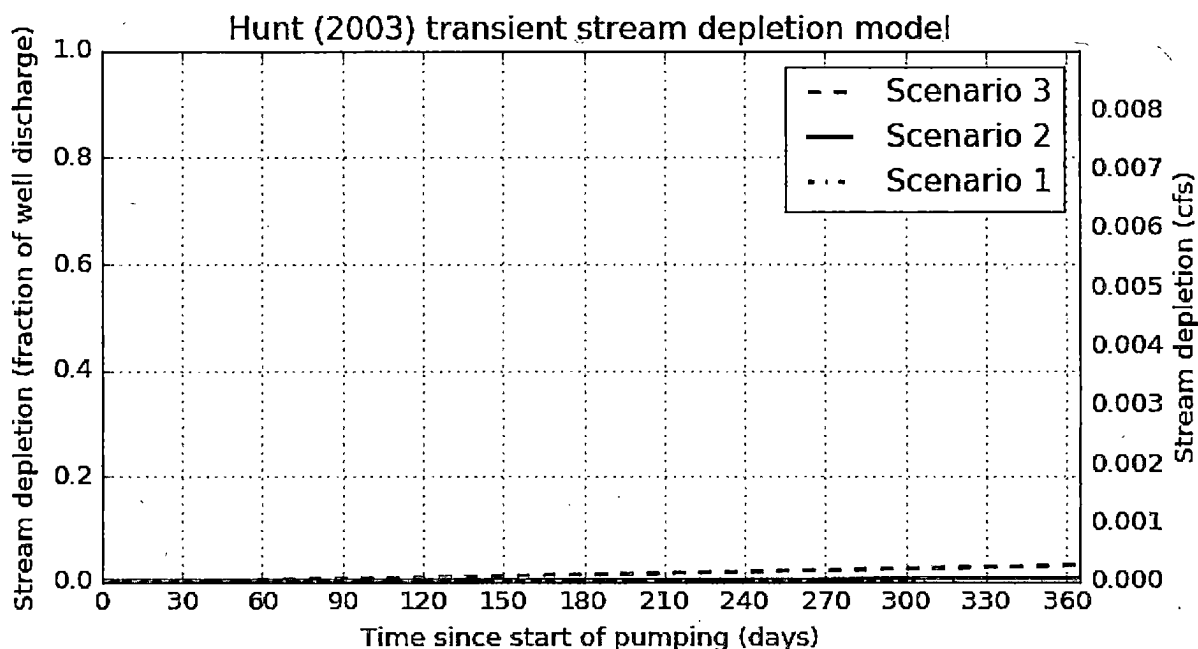


Figure 5. Stream Depletion Model

Application type:	G
Application number:	18519
Well number:	5
Stream Number:	1
Pumping rate (cfs):	0.29
Pumping duration (days):	365
Pumping start month number (3=March)	1

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	5290	5290	5290	ft
Aquifer transmissivity	T	1000	2500	5000	ft ² /day
Aquifer storativity	S	0.1	0.05	0.01	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Aquitard saturated thickness	ba	10.0	15	20	ft
Aquitard thickness below stream	babs	4	3	2	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	10	10	10	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

