Groundwater Review Summary Form

Application # G- 18387

GW Reviewer M. Thoma **Date Review Completed:** 01-18-17

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 01-18 ,2017

TO: **Application** G- 18387

FROM: **GW:** M. Thoma
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☒ YES
The source of appropriation is within or above a Scenic Waterway
☐ 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 January 18, 2017

FROM: Groundwater Section Michael J Thoma
Reviewer's Name

SUBJECT: Application G- 18387 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: **Austin Hinkle** County: **Josephine**

A1. Applicant(s) seek(s) 0.07 cfs from 1 well(s) in the Rogue Basin, Lower Rogue subbasin

A2. Proposed use Nursery (2.5 ac) 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	JOSE 12934	1	Bedrock	0.07	36S/06W-06 NESW	1181'N, 1873'E of SW cor S6†
2						

* Alluvium, CRB, Bedrock

†values based on revised map received from WM Office 01/18/2017

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	1120	45	10	06-11-87	105	0-24	0-27	-	-	30		A

Use data from application for proposed wells.

A4. **Comments:** _____

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: _____

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) **7J (Scenic Waterway); 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:** There are two permitted POAs in the same Section as the proposed POA that have been reporting water levels annually since 2010. Both wells show stable trends which imply that groundwater has not been over-appropriated in the area. These POAs are the only permitted wells in area and are within ¼ mile of the proposed POA. Interference is difficult to predict in fractured-bedrock aquifers so the likelihood of the applicant's proposed use causing injury to existing permitted groundwater user cannot be determined. Standard interference conditions should be applied to any permit resulting from this review.

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 Grants Pass Pluton**	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: The well log for the proposed well, along with well logs for the surrounding area and of similar depths, typically report *SWLs* above *First Water* indicating, at least, partially-confined aquifer 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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Pass Creek**	~1110	940-980	4500*	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevations are estimated to be above SW elevations suggesting groundwater is flowing towards and discharging to surface water

*This distance is to the confluence of the unnamed tributary and Pass Cr in the NWSW quarter-quarter in Section 7. The reviewer finds this to be the nearest location where groundwater influenced by the proposed use could be affecting a viable surface water source.

Water Availability Basin the well(s) are located within: Rogue R > Pacific Ocean – AB Grave Cr (ID# 31531002)

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	☐	☐	**NA**	-	☐	**1130**	☐	**< 5%**	☐
		☐	☐			☐		☐		☐

Comments: Interference was calculated using the Hunt (1999) analytical stream-depletion model and parameters typical of granitic fractured aquifers.

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:

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		**No surface water sources beyond 1 mile were evaluated**											
Interference CFS													
Distributed Wells Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
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:** The applicant's proposed well would be producing from an aquifer that has been found to be hydraulically connected to surface water at a distance of < 1 mile. However, the reviewer is unable to find a preponderance of evidence that the proposed use will have the Potential for Substantial Interference (PSI) with surface water.

References Used:

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Oregon Department of Geology and Mineral Industries, *Geologic Map of Oregon*. http://www.oregongeology.org/geologicmap/

OWRD Well Log Database – Accessed 1/18/2017.

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

ROGUE R > PACIFIC OCEAN - AB GRAVE CR
ROGUE BASIN

Water Availability as of 12/20/2016

Watershed ID #: 31531002 (Map) Exceedance Level: 80%

Date: 12/20/2016 Time: 3:19 PM

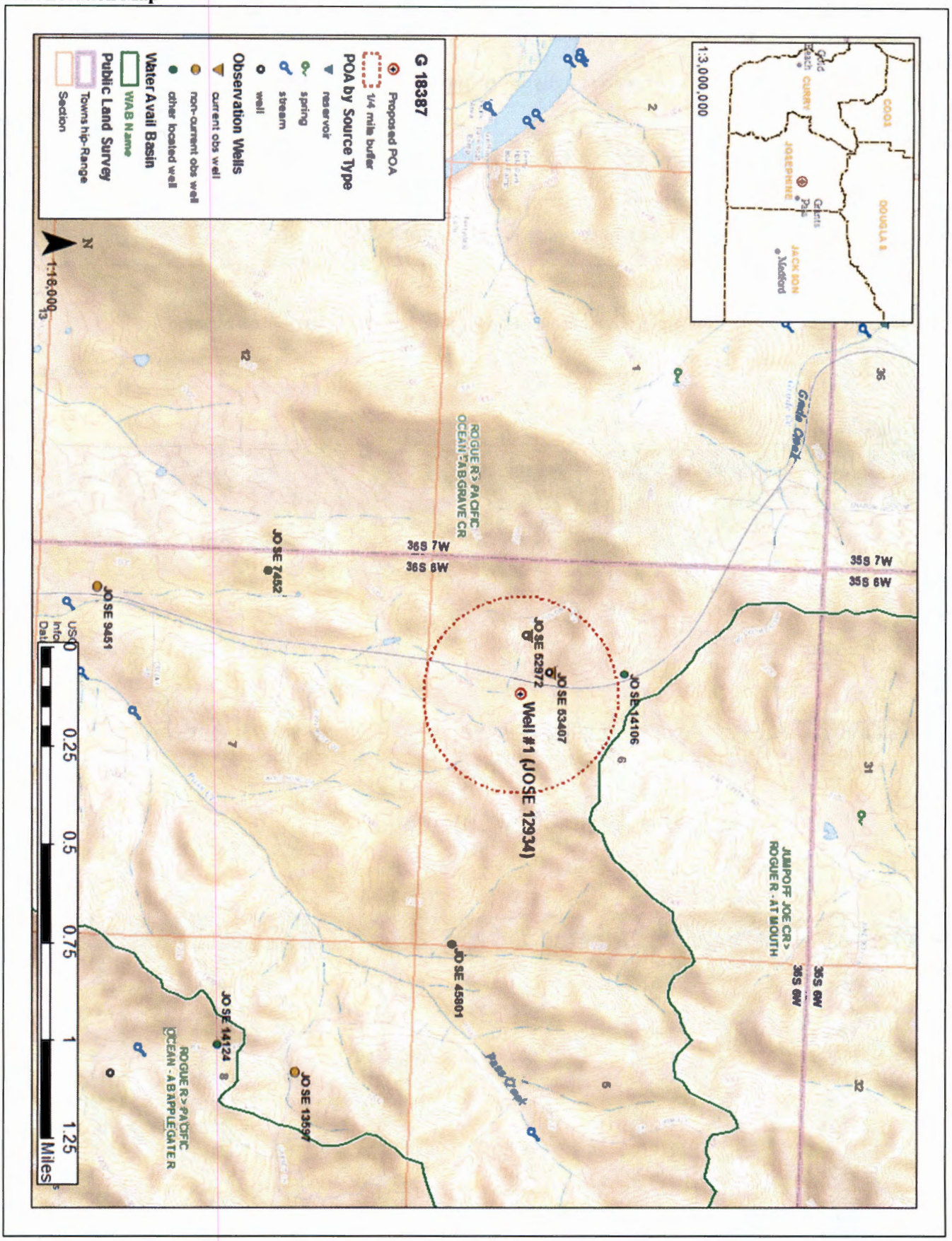
Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

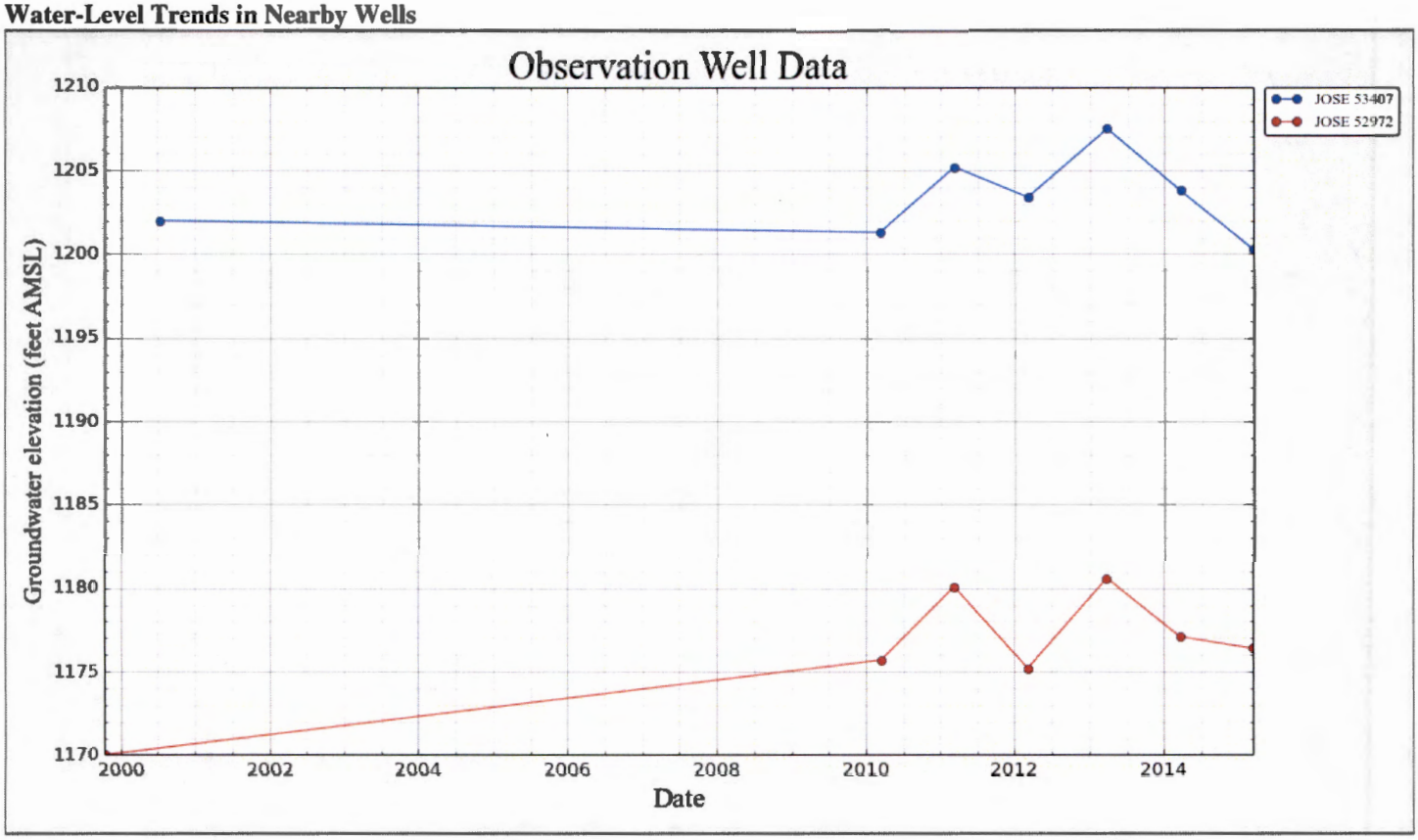
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	3,210.00	1,070.00	2,140.00	0.00	3,500.00	-1,360.00
FEB	4,740.00	2,480.00	2,260.00	0.00	3,500.00	-1,240.00
MAR	4,390.00	2,230.00	2,160.00	0.00	3,500.00	-1,340.00
APR	3,830.00	1,490.00	2,340.00	0.00	3,500.00	-1,160.00
MAY	3,370.00	410.00	2,960.00	0.00	3,000.00	-40.10
JUN	2,010.00	466.00	1,540.00	0.00	2,700.00	-1,160.00
JUL	1,320.00	518.00	802.00	0.00	2,000.00	-1,200.00
AUG	1,160.00	462.00	698.00	0.00	2,400.00	-1,700.00
SEP	1,130.00	375.00	755.00	0.00	2,400.00	-1,650.00
OCT	1,240.00	239.00	1,000.00	0.00	1,600.00	-599.00
NOV	1,420.00	286.00	1,130.00	0.00	3,500.00	-2,370.00
DEC	2,620.00	550.00	2,070.00	0.00	3,500.00	-1,430.00
ANN	2,700,000.00	632,000.00	2,070,000.00	0.00	2,120,000.00	332,000.00

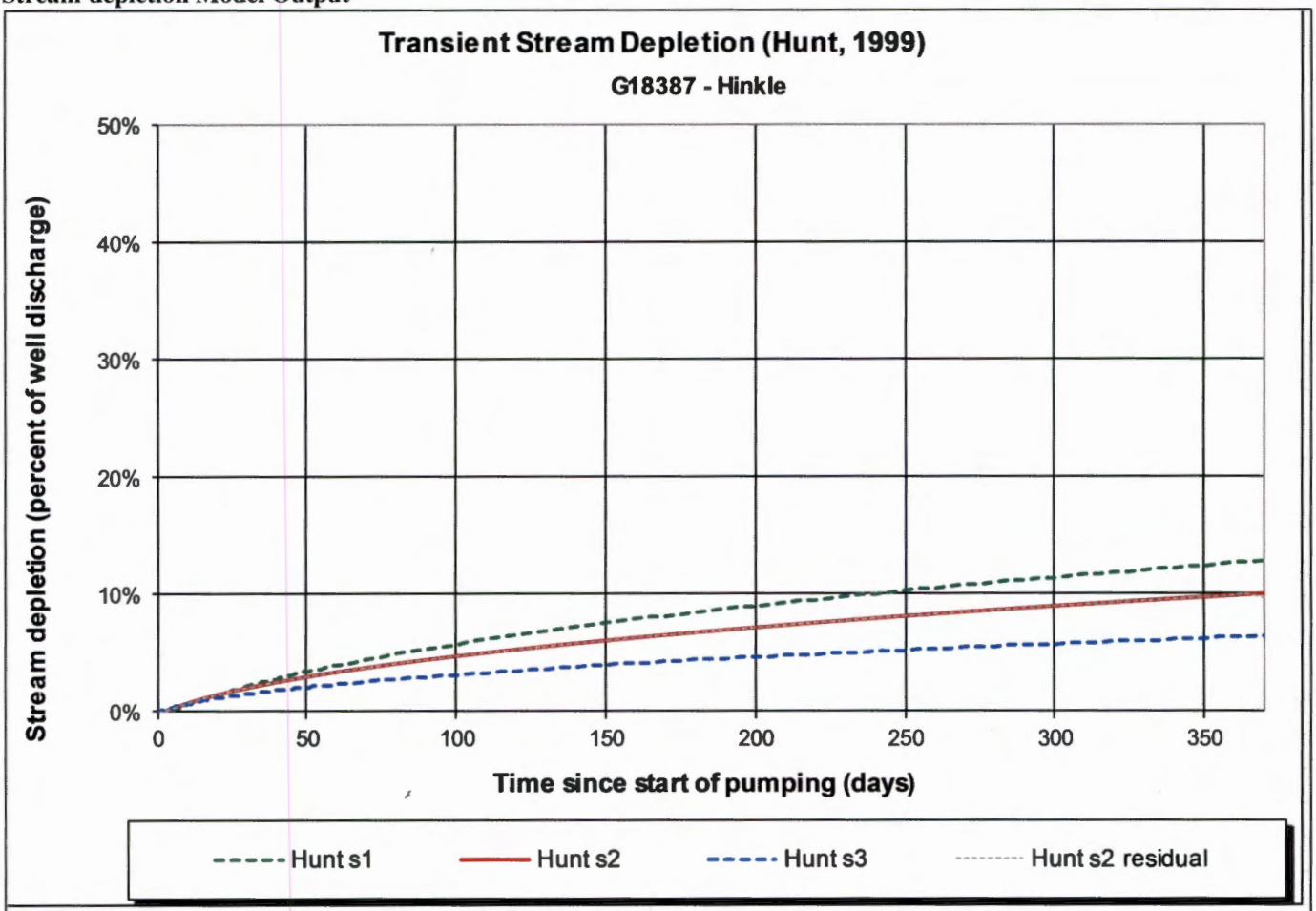
Well Location Map



Water-Level Trends in Nearby Wells



Stream-depletion Model Output



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 365 days

Days	**30**	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070
Jenk SD s2 %	**68.12**	77.15	81.25	83.73	85.42	86.68	87.66	88.45	89.11	89.66	90.14	90.56
Jen SD s2 cfs	0.048	0.054	0.057	0.059	0.060	0.061	0.061	0.062	0.062	0.063	0.063	0.063
Hunt SD s2 %	**2.02**	3.37	4.41	5.28	6.04	6.72	7.34	7.92	8.45	8.95	9.43	9.88
Hunt SD s2 cfs	0.001	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.007	0.007

Parameters:		**Scenario 1**	**Scenario 2**	**Scenario 3**	**Units**
Net steady pumping rate	Qw	0.07	0.07	0.07	cfs
Distance to stream	a	4500	4500	4500	ft
Aquifer hydraulic conductivity	K	50	100	300	ft/day
Aquifer thickness	b	200	200	200	ft
Aquifer transmissivity	T	10000	20000	60000	ft*ft/day
Aquifer storage coefficient	S	0.01	0.01	0.01	
Stream width	ws	5	5	5	ft
Streambed hydraulic conductivity	Ks	0.1	0.1	0.1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	0.166666667	0.166666667	0.166666667	ft/day
Stream depletion factor (Jenkins)	sdf	20.3	10.1	3.4	days
Streambed factor (Hunt)	sbf	0.1	0.0	0.0	