

WATER RESOURCES DEPARTMENT

MEMO

March 14, 2016

TO: Application G- ~~18251~~ 18251

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 Illinois 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	0.093	0.083	0.083



PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date March 14, 2016

FROM: Groundwater Section Michael J Thoma  
Reviewer's Name

SUBJECT: Application G- 18251 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 to 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: Rhea Taylor County: Josephine

A1. Applicant(s) seek(s) 0.04 cfs from 1 well(s) in the Rogue Basin,  
Sucker Cr > Illinois R subbasin

A2. Proposed use Nursery (3 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 54064	1	Alluvium	0.04	39S/07W-31 NENW	634'S, 2363'E of NW cor S 31
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	1455	170	36	6/9/2001	200	0-23	+1-96			25		A

Use data from application for proposed wells.

A4. **Comments:** The applicant's proposed well will be producing from alluvial sediments of the Illinois River Valley. These valley sediments extend to probably a little over 200 ft in the area and produce moderate amounts of water (5-50 gpm).

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) 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:** Groundwater use in the area of the proposed POA is small and the proposed use will not likely cause significant interference with senior groundwater users. There are several wells in the area for which OWRD has considerable SWL records. These wells show stable SWLs over the past few decades implying that groundwater is not over-appropriated and is within the capacity of the resource.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**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	Alluvium of Illinois Valley	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** the applicant's well, along with most wells in the area, report SWLs significantly higher than 'first water' on the 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
1	1	Sucker Cr	1420	1420-1480	1920	<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"/>	<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:** coincident GW and SW elevations; alluvial nature of aquifer

**Water Availability Basin the well(s) are located within:** Sucker Cr > E Fk Illinois R – At Mouth (ID# 69808)

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	<input type="checkbox"/>	<input type="checkbox"/>	IS69808	54	<input type="checkbox"/>	25.90	<input type="checkbox"/>	< 1%	<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"/>		<input type="checkbox"/>

**Comments:** Interference at 30 d was estimated using the Hunt (2003) analytical model with typical parameter values for coarse alluvial aquifer material (i.e., high transmissivity). Results imply that interference will be insignificant for the proposed use

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?
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>



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.

<b>Non-Distributed Wells</b>													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
<b>Distributed Wells</b>													
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 POA will be producing from an aquifer that the Department has found to be in hydraulic connection with surface water, specifically Sucker Cr. However, the proposed rate is below the threshold where the Department would assume the use has the Potential for Substantial Interference (PSI) per OAR 690-009.  
 \_\_\_\_\_  
 \_\_\_\_\_

**References Used:**

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

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

Contreras, T. A. 2005. *Using Magnetotellurics to Characterize Aquifers in the Illinois Valley, Southwest Oregon*. MS Thesis, University of Oregon.



**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:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

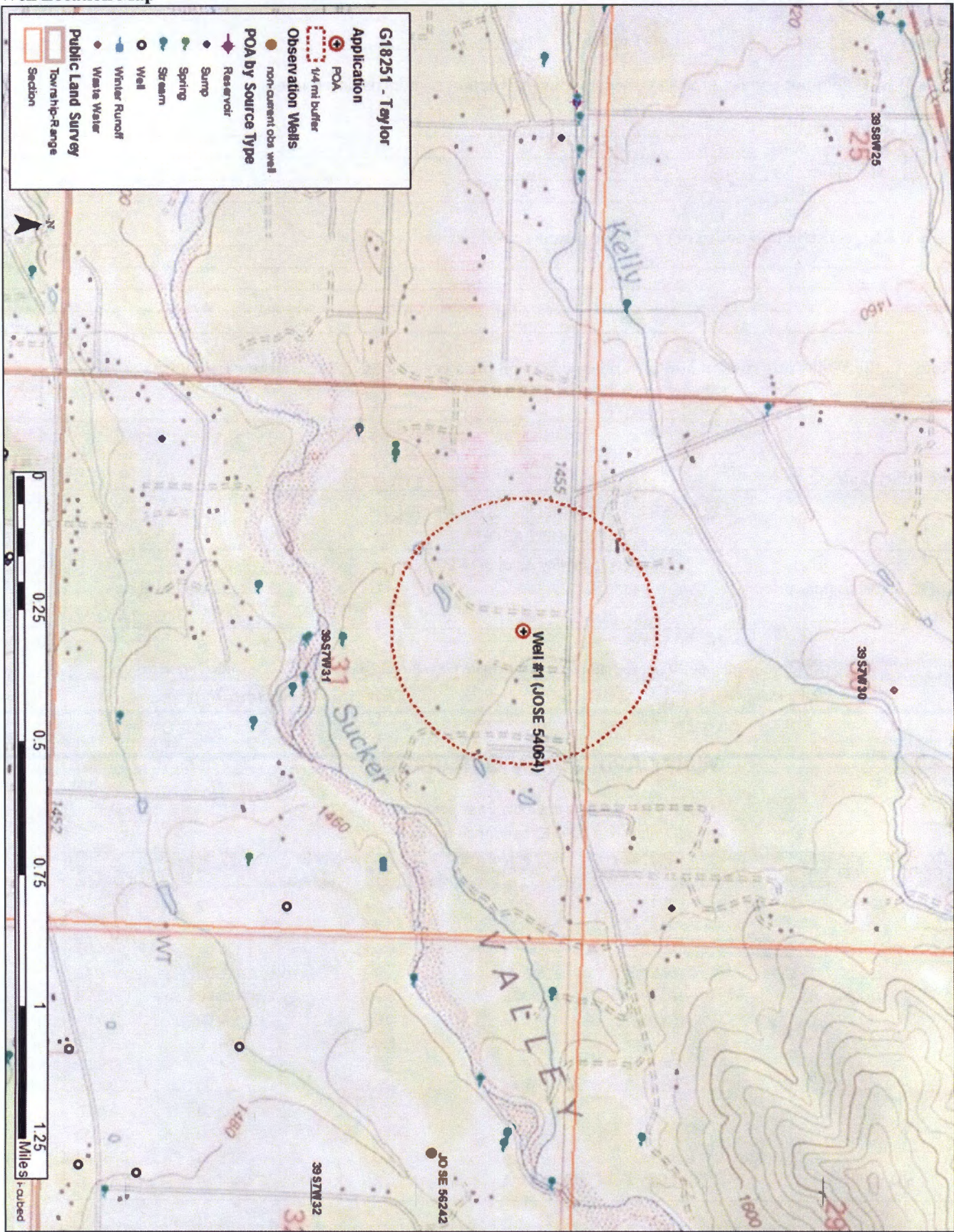
D4.  **Route to the Well Construction and Compliance Section for a review of existing well construction.**

**Water Availability Tables**

SUCKER CR > E FK ILLINOIS R - AT MOUTH ROGUE BASIN							
Water Availability as of 3/14/2016							
Watershed ID #: 69808 ( <a href="#">Map</a> )				Exceedance Level: 80% ▾			
Date: 3/14/2016				Time: 1:03 PM			
Water Availability Calculation		Consumptive Uses and Storages		Instream Flow Requirements		Reservations	
Water Rights		Watershed Characteristics					
<b>Water Availability Calculation</b>							
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	132.00	0.17	132.00	0.00	135.00	-3.17	
FEB	221.00	0.19	221.00	0.00	135.00	85.80	
MAR	220.00	0.19	220.00	0.00	135.00	84.80	
APR	215.00	2.57	212.00	0.00	135.00	77.40	
MAY	162.00	4.02	158.00	0.00	135.00	23.00	
JUN	79.70	5.58	74.10	0.00	80.00	-5.88	
JUL	42.60	7.44	35.20	0.00	54.00	-18.80	
AUG	30.40	6.15	24.20	0.00	54.00	-29.80	
SEP	25.90	4.05	21.80	0.00	80.00	-58.20	
OCT	26.10	1.37	24.70	0.00	80.00	-55.30	
NOV	36.80	0.14	36.70	0.00	135.00	-98.30	
DEC	77.30	0.14	77.20	0.00	135.00	-57.80	
ANN	134,000.00	1,940.00	132,000.00	0.00	77,900.00	64,400.00	

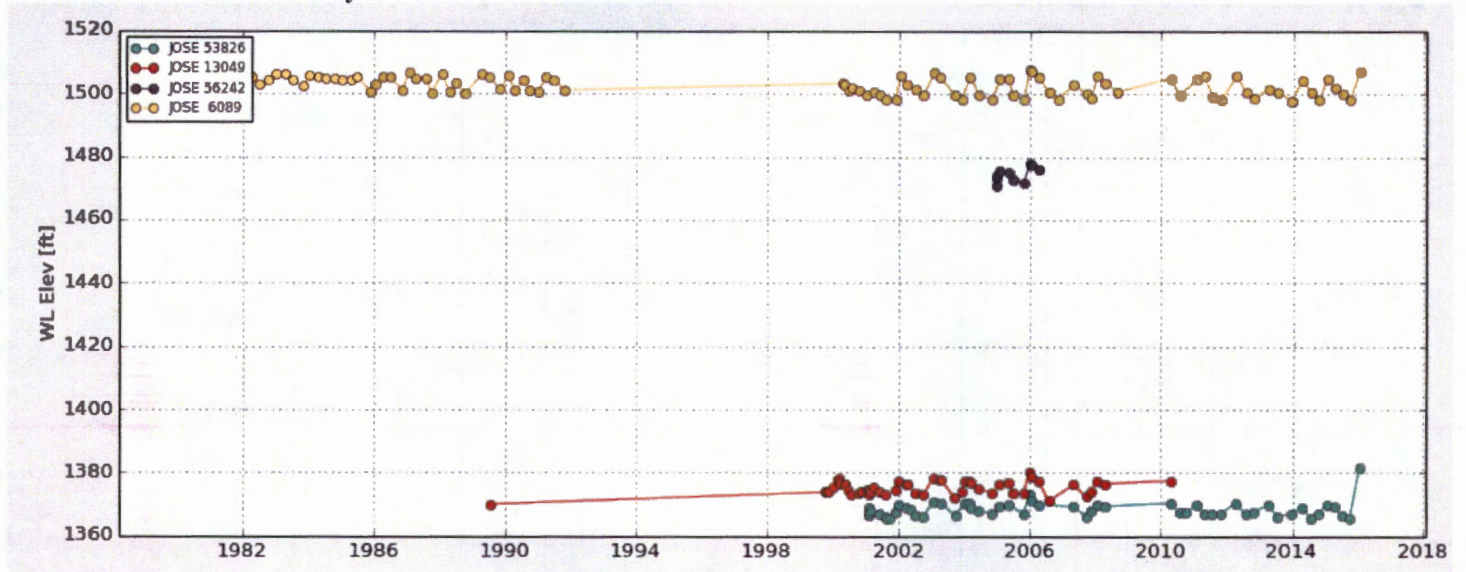


### Well Location Map



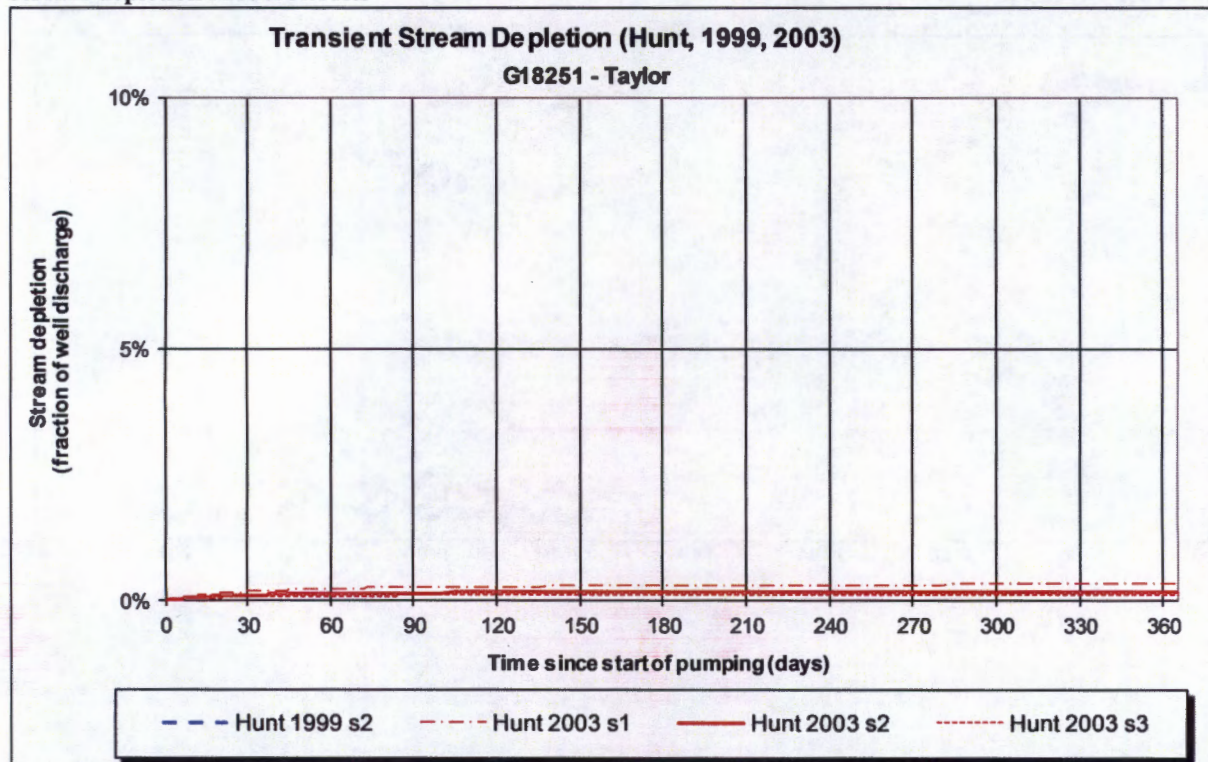


### Water-Level Trends in Nearby Wells





Stream-depletion Model Results



Output for Stream Depletion, Scenerio 2 (s2):					Time pump on (pumping duration) = 365 days							
Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
J SD	89.3%	92.4%	93.8%	94.6%	95.2%	95.6%	95.9%	96.2%	96.4%	96.6%	96.8%	96.9%
H SD 1999												
<b>H SD 2003</b>	<b>0.11%</b>	<b>0.14%</b>	<b>0.16%</b>	<b>0.17%</b>	<b>0.17%</b>	<b>0.18%</b>	<b>0.18%</b>	<b>0.18%</b>	<b>0.19%</b>	<b>0.19%</b>	<b>0.19%</b>	<b>0.20%</b>
H SD 03, cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.04	<b>0.04</b>	0.04	cfs
Time pump on (pumping duration)	tpon	365	<b>365</b>	365	days
Perpendicular from well to stream	a	1920	<b>1920</b>	1920	ft
Well depth	d	200	<b>200</b>	200	ft
Aquifer hydraulic conductivity	K	50	<b>200</b>	500	ft/day
Aquifer saturated thickness	b	170	<b>170</b>	170	ft
Aquifer transmissivity	T	8500	<b>34000</b>	85000	ft*ft/day
Aquifer storativity or specific yield	S	0.01	<b>0.01</b>	0.01	
Aquitard vertical hydraulic conductivity	Kva	0.001	<b>0.001</b>	0.001	ft/day
Aquitard saturated thickness	ba	5	<b>5</b>	5	ft
Aquitard thickness below stream	babs	3	<b>3</b>	3	ft
Aquitard porosity	n	0.15	<b>0.15</b>	0.15	
Stream width	ws	30	<b>30</b>	30	ft
Streambed conductance (lambda)	sbc	0.010	<b>0.010</b>	0.010	ft/day
Stream depletion factor	sdf	4.337	<b>1.084</b>	0.434	days
Streambed factor	sbf	0.002	<b>0.001</b>	0.000	
input #1 for Hunt's Q_4 function	t'	0.231	<b>0.922</b>	2.306	
input #2 for Hunt's Q_4 function	K'	0.087	<b>0.022</b>	0.009	
input #3 for Hunt's Q_4 function	epsilon'	0.067	<b>0.067</b>	0.067	
input #4 for Hunt's Q_4 function	lamda'	0.002	<b>0.001</b>	0.000	