

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date April 2, 2016
 FROM: Groundwater Section Michael J Thoma
 SUBJECT: Application G- 18210 Reviewer's Name Michael J Thoma
 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: Suzie Dahm County: Josephine

A1. Applicant(s) seek(s) 0.02 cfs from 1 well(s) in the Rogue Basin, Illinois subbasin

A2. Proposed use Nursery (2.7 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 59596	1	Alluvium	0.02	40S/08W-10 NENE	557'S, 390'W of NE cor S10
2						
3						

* 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	1400	81	57 ^A	9/1/2015	120	0-18	+1.5-98.5		78-98	8		A

Use data from application for proposed wells.

A4. **Comments:** ^AReported SWL was taken the day the well was completed and likely represents a recovery level and not a true static

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) 7C (7-yr SWL); 7J (Scenic WW); Med. 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 POA would be producing from alluvial material of the Illinois River Valley. This alluvial aquifer system is over several hundred ft thick near the center of the valley and pinches to 0 ft near the edges. The applicant’s well log reports alluvial material to the full depth of 120 ft (mostly mixed clay/sand/gravel).

There are few other permitted groundwater rights in the immediate area of the proposed POA and OWRD SWL data for several wells in the valley show stable trends through the last few decades. However, due to the currently increasing development of groundwater in the Illinois River Valley, the reviewer recommends a seven-year static water-level condition

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 River Valley	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: applicant's well log reports SWL 24 ft above 'first water'; other well logs for the area suggest increasing confinement with depth in the alluvial sediments.

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	E Fk Illinois River	1320 (1360-1380)*	1360-1420	~1900	<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"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: similar GW and SW elevations – see below;

*Although the applicant's well log reports a SWL of 57 ft BLS, the majority of well logs in the immediate area report SWL between 15 and 35 ft BLS and OWRD SWL data from wells in the Illinois Valley typically range from 5 to 30 ft BLS. This range of SWL is what is presented in parentheses.

Water Availability Basin the well(s) are located within: E Fk Illinois R > Illinois R – At Mouth (ID# 70980)

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"/>	IS70980	51.4	<input type="checkbox"/>	41.50	<input type="checkbox"/>	< 5%	<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"/>

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.

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

Comments: results of stream-depletion model (Hunt 1999) are attached

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													
(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 proposed POA is hydraulically connected to the E Fk Illinois River but will not have the Potential for Substantial Interference per OAR 690-009

References Used:

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

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

OWRD Well Log Database – accessed 04/02/2016

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) _____

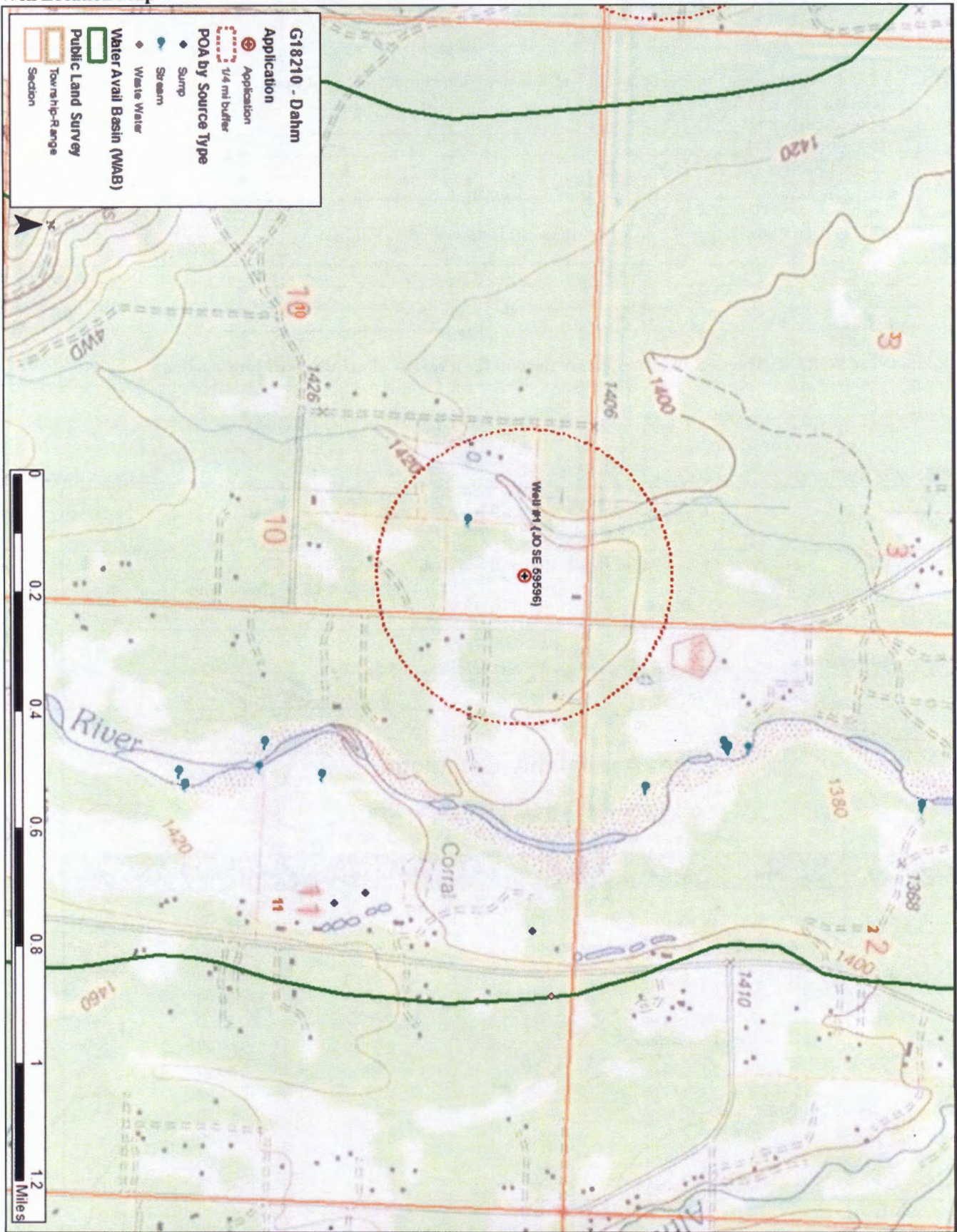
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

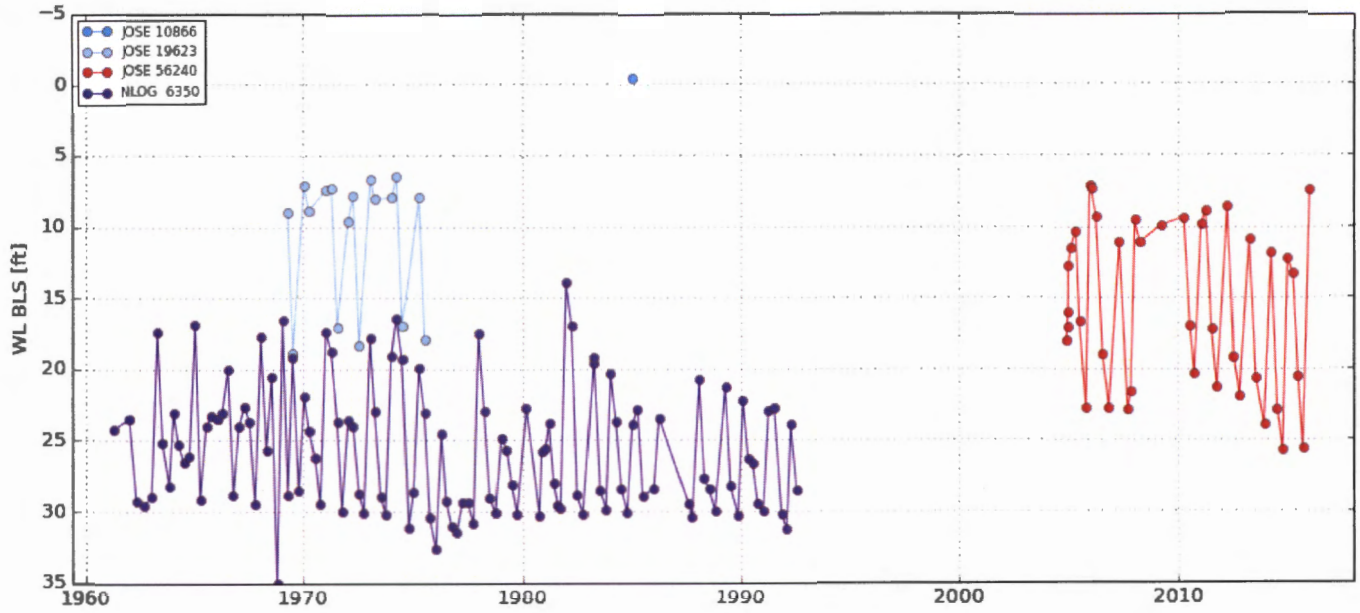
Water Availability Tables

E FK ILLINOIS R > ILLINOIS R - AT MOUTH ROGUE BASIN							
Water Availability as of 4/2/2016							
Watershed ID #: 70980 (Map)				Exceedance Level: 80% ▾			
Date: 4/2/2016				Time: 1:42 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	342.00	4.20	338.00	0.00	135.00	203.00	
FEB	535.00	4.36	531.00	0.00	135.00	396.00	
MAR	556.00	4.40	552.00	0.00	135.00	417.00	
APR	498.00	8.94	489.00	0.00	135.00	354.00	
MAY	317.00	11.70	305.00	0.00	135.00	170.00	
JUN	139.00	14.80	124.00	0.00	80.00	44.20	
JUL	66.30	18.60	47.70	0.00	60.00	-12.30	
AUG	46.10	15.90	30.20	0.00	54.00	-23.80	
SEP	41.50	11.60	29.90	0.00	70.00	-40.10	
OCT	47.70	6.00	41.70	0.00	100.00	-58.30	
NOV	102.00	3.51	98.50	0.00	135.00	-36.50	
DEC	290.00	4.01	286.00	0.00	135.00	151.00	
ANN	330,000.00	6,540.00	323,000.00	0.00	78,900.00	249,000.00	

Well Location Map



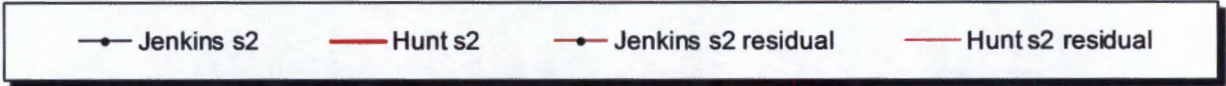
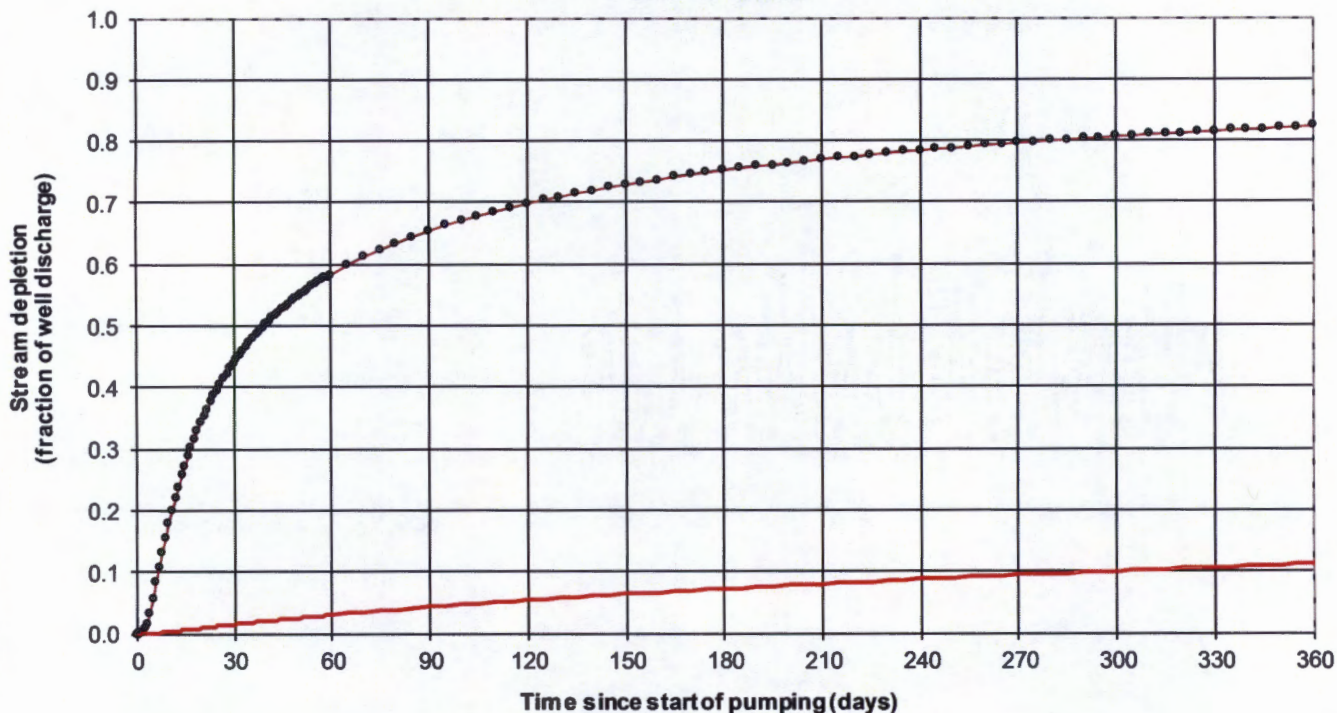
Water-Level Trends in Nearby Wells



Results of Stream-depletion Model

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

G18210 - Dahm



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

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
Jenk SD s2 %	43.79	58.34	65.43	69.81	72.87	75.15	76.94	78.39	79.60	80.62	81.51	82.28
Jen SD s2 cfs	0.008	0.010	0.012	0.012	0.013	0.013	0.014	0.014	0.014	0.014	0.015	0.015
Hunt SD s2 %	1.49	3.04	4.30	5.38	6.34	7.20	7.99	8.71	9.39	10.03	10.63	11.20
Hunt SD s2 cfs	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002

Parameters:

		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	8	8	8	gpm
Distance to stream	a	1900	1900	1900	ft
Aquifer hydraulic conductivity	K	1	10	100	ft/day
Aquifer thickness	b	100	100	100	ft
Aquifer transmissivity	T	100	1000	10000	ft*ft/day
Aquifer storage coefficient	S	0.01	0.01	0.01	
Stream width	ws	150	150	150	ft
Streambed hydraulic conductivity	Ks	0.001	0.001	0.001	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	0.05	0.05	0.05	ft/day
Stream depletion factor (Jenkins)	sdf	361	36.1	3.61	days
Streambed factor (Hunt)	sbf	0.95	0.095	0.0095	