

Groundwater Review Summary Form

Application # G- 18285 Re-Review

GW Reviewer J. Hackett Date Review Completed: 2/14/2017

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date February 14, 2017

FROM: Groundwater Section J. Hackett
Reviewer's Name

SUBJECT: Application G- 18285 Supersedes review of July 14, 2016
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: Hood River Cherry County: Hood

A1. Applicant(s) seek(s) 0.99** cfs from 1 well(s) in the Hood River Basin,
 _____ subbasin

A2. Proposed use Irrigation Seasonality: March 1 – 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 Well	1	High Cascades volcanics/volcaniclastics	0.99	1S/10E-17 NW-SE	416' S, 1470' W fr E 1/4 cor S 17
2						
3						
4						
5						

* 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	2280	172 est	105 est		250-350 est	0-24 est	+1-246 est		238-246 est			

Use data from application for proposed wells.

A4. **Comments:** **Applicant has changed POA to a proposed well that is greater than 1 mile from Evans Creek and reduced the requested rate to 0.99 cfs. This review reflects the new proposed location and requested rate.

A5. **Provisions of the** Hood 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) 7N; Large 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 material underlying the Upper Hood River Valley is composed primarily of Late High-Cascade volcanic and volcanoclastic deposits to depths of at least 250 ft bls in most of the valley and more than 450 ft bls in some places, but the total thickness is unknown for most of the valley. There are no wells deeper than 450 ft so there is no information on the deeper geologic material but there are likely lava flows of the Columbia River Basalt Group (CRBG) at depth. The shallow aquifer in this area is composed of local, laterally discontinuous lava flows and volcanoclastic deposits. Some of the fine-grained volcanoclastic deposits may act as local confining layers, but at the regional scale wells producing from this aquifer will be hydraulically connected to nearby surface water sources. The efficiency of the hydraulic connection with local surface water sources is likely to be greater with shallower wells but deeper wells are still likely penetrating aquifer units that ultimately discharge to streams and springs.

Water level trends in nearby wells show no obvious signs of declines (see attached hydrograph).

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	High Cascade Volcanics	<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"/>

Basis for aquifer confinement evaluation: Existing well logs in the area show static water levels higher than depth of water-bearing zones, indicating semi-confined conditions. However, the lack of a laterally extensive confining layer (i.e. no laterally extensive fine-grained layer) and the presence of several springs in the area imply effective connection between GW and SW.

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	East Fork Hood River	2170	2000	2030	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Evans Creek	2170	2040	5290	<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"/>
						<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: Groundwater levels are coincident with or above the elevation of local stream reaches and numerous springs are present in the area. These factors indicate groundwater flow is toward the streams and suggests hydraulic connection between the groundwater system and nearby surface water sources.

Water Availability Basin the well(s) are located within: 189 E FK HOOD R > HOOD R – AB M FK HOOD R; 30410508; EVANS CR > E FK HOOD R – AT MOUTH

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"/>	MF189A	100.00	<input type="checkbox"/>	134.00	<input type="checkbox"/>	<25%	<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"/>		<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"/>

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?
	2	<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"/>

Comments: Modeling in similar circumstances suggests that due to the presence of fine-grained material in the channel of the East Fork Hood River, pumping impacts will be less than 25% of the pumping rate after 30 days of pumping.

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
1	2	1.77 %	1.69 %	.09 %	.35 %	.61 %	.87 %	1.12 %	1.35 %	1.57 %	1.77 %	1.91 %	1.86 %
Well Q as CFS		0.0	0.0	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.0	0.0
Interference CFS		.012	.011	.001	.002	.004	.006	.007	.009	.010	.012	.012	.012
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													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.		.012	.011	.001	.002	.004	.006	.007	.009	.010	.012	.012	.012
(B) = 80 % Nat. Q		6.54	10.90	14.70	13.90	6.75	3.12	3.04	2.28	2.03	1.49	2.22	1.64
(C) = 1 % Nat. Q		.0654	.109	.147	.139	.0675	.0312	.0304	.0228	.0203	.0149	.0222	.0164
(D) = (A) > (C)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(E) = (A / B) x 100		.18 %	.10 %	.007 %	.014 %	.06 %	.19 %	.23 %	.39 %	.49 %	.81 %	.54 %	.73 %

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**

**E FK HOOD R > HOOD R - AB M FK HOOD R
HOOD BASIN**

Water Availability as of 1/3/2017

Watershed ID #: 189 ([Map](#))

Exceedance Level: 80%

Date: 1/3/2017

Time: 11:45 AM

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	207.00	13.70	193.00	130.00	100.00	-36.30
FEB	268.00	17.50	250.00	136.00	100.00	14.10
MAR	286.00	34.90	251.00	122.00	100.00	28.80
APR	288.00	57.50	231.00	104.00	150.00	-23.40
MAY	308.00	105.00	203.00	111.00	150.00	-57.80
JUN	253.00	151.00	102.00	79.30	150.00	-127.00
JUL	206.00	161.00	44.50	0.00	100.00	-55.50
AUG	152.00	149.00	2.77	0.00	100.00	-97.20
SEP	146.00	109.00	36.90	0.00	100.00	-63.10
OCT	134.00	60.00	74.00	22.20	150.00	-98.20
NOV	163.00	17.80	145.00	41.60	150.00	-46.40
DEC	190.00	12.50	178.00	86.10	150.00	-58.60
ANN	206,000.00	53,900.00	152,000.00	50,000.00	90,600.00	22,700.00

Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF189A	CERTIFICATE	100.0	100.0	100.0	150.0	150.0	150.0	100.0	100.0	100.0	150.0	150.0	150.0
		0	0	0	0	0	0	0	0	0	0	0	0
Maximum		100.0	100.0	100.0	150.0	150.0	150.0	100.0	100.0	100.0	150.0	150.0	150.0
		0	0	0	0	0	0	0	0	0	0	0	0

Water Availability Analysis Detailed Reports

EVANS CR > E FK HOOD R - AT MOUTH HOOD BASIN

Water Availability as of 7/14/2016

Watershed ID #: 30410508 ([Map](#))

Exceedance Level:

Date: 7/14/2016

Time: 5:26 PM

Water Availability Calculation

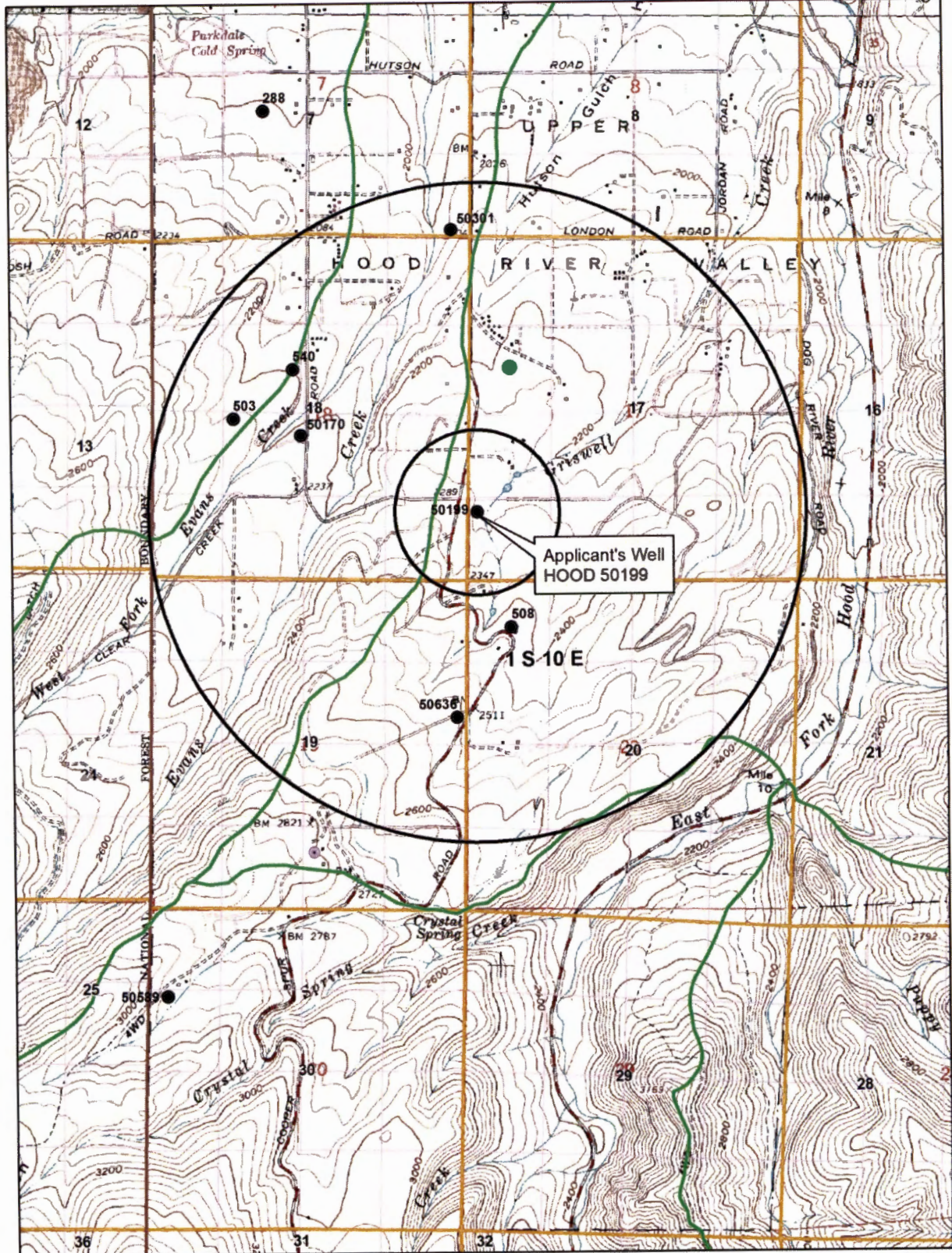
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	6.54	0.05	6.49	0.00	0.00	6.49
FEB	10.90	0.05	10.80	0.00	0.00	10.80
MAR	14.70	0.10	14.60	0.00	0.00	14.60
APR	13.90	0.85	13.00	0.00	0.00	13.00
MAY	6.75	1.57	5.18	0.00	0.00	5.18
JUN	3.12	2.05	1.07	0.00	0.00	1.07
JUL	3.04	2.67	0.37	0.00	0.00	0.37
AUG	2.28	2.15	0.13	0.00	0.00	0.13
SEP	2.03	1.35	0.68	0.00	0.00	0.68
OCT	1.49	0.28	1.21	0.00	0.00	1.21
NOV	2.22	0.05	2.17	0.00	0.00	2.17
DEC	1.64	0.05	1.59	0.00	0.00	1.59
ANN	6,610.00	682.00	5,930.00	0.00	0.00	5,930.00

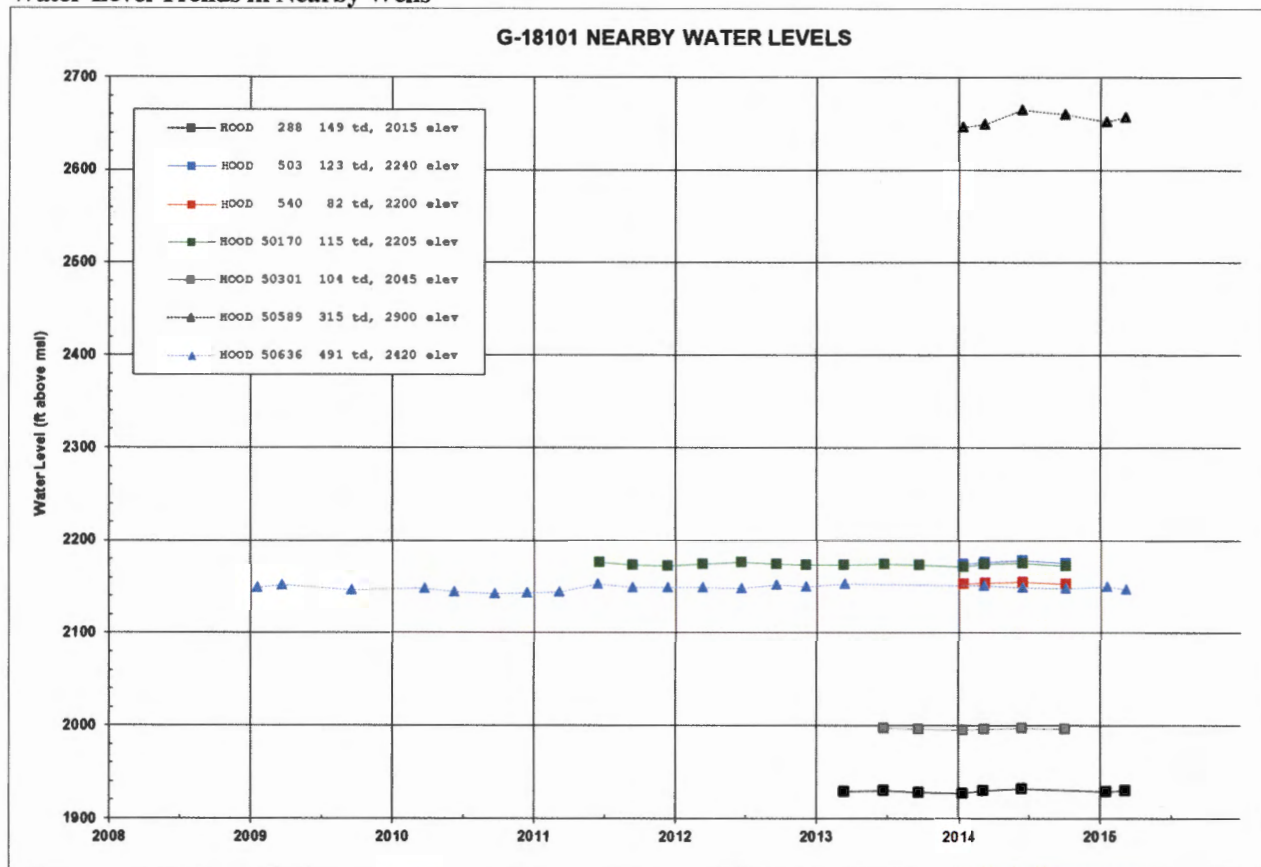
Well Location Map

G-18285, Hood River Cherry

1:24,000 scale



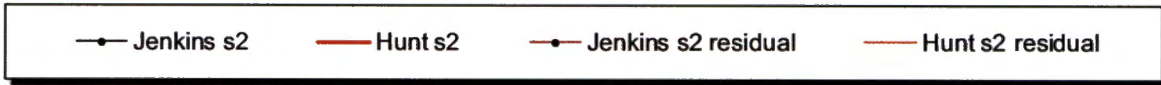
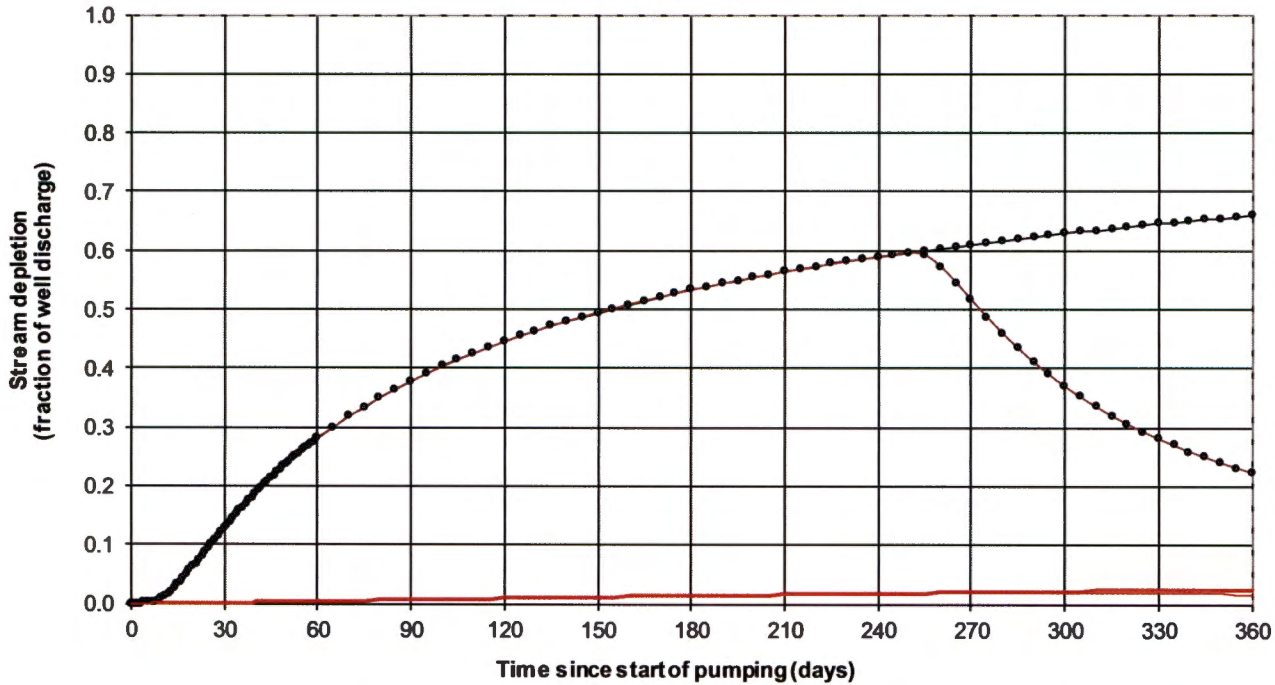
Water-Level Trends in Nearby Wells



Modeling Results

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

G-18285 with Evans Ck



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 245 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
Jenk SD s2 %	12.67	28.02	37.80	44.51	49.46	53.30	56.38	58.93	51.64	36.98	28.09	22.39
Jen SD s2 cfs	0.082	0.182	0.246	0.289	0.322	0.346	0.366	0.383	0.336	0.240	0.183	0.146
Hunt SD s2 %	0.09	0.35	0.61	0.87	1.12	1.35	1.57	1.77	1.91	1.86	1.77	1.69
Hunt SD s2 cfs	0.001	0.002	0.004	0.006	0.007	0.009	0.010	0.012	0.012	0.012	0.012	0.011

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.65	0.65	0.65	cfs
Distance to stream	a	5290	5290	5290	ft
Aquifer hydraulic conductivity	K	100	100	100	ft/day
Aquifer thickness	b	200	200	200	ft
Aquifer transmissivity	T	20000	20000	20000	ft*ft/day
Aquifer storage coefficient	S	0.1	0.1	0.1	
Stream width	ws	10	10	10	ft
Streambed hydraulic conductivity	Ks	0.1	0.1	1	ft/day
Streambed thickness	bs	3	5	3	ft
Streambed conductance	sbc	0.333333333	0.2	3.333333333	ft/day
Stream depletion factor (Jenkins)	sdf	139.9205	139.9205	139.9205	days
Streambed factor (Hunt)	sbf	0.088166667	0.0529	0.881666667	