Groundwater Review Summary Form

Application # G- 18311 -RR

GW Reviewer M. Thoma **Date Review Completed:** 04-04-17

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 04-04-, 2017

TO: **Application** G- 18311 -RR

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
1/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **April 4, 2017**

FROM: Groundwater Section **Michael J. Thoma**
Reviewer's Name

SUBJECT: Application G- **18311** Supersedes review of **October 31, 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:
Christina Arapolu / John & Sandra Thorne; Easy Valley Farm LLC County: **Jackson**

A1. Applicant(s) seek(s) **0.15** cfs from **1** well(s) in the **Rogue** Basin, **Evans Creek** subbasin

A2. Proposed use **Nursery (34.69 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	Proposed		Weathered Bedrock	0.15	36S/04W-03 SWSW	929'N, 286'E of SW cor. S 03
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	~1060		25*		150†	0-19	0-20					

Use data from application for proposed wells.

A4. **Comments:** *The applicant's well is proposed and the reviewer was only able to find three well logs for the area that were tied to taxlots and thus for which the location could be confidently estimated. Of those logs, the SWL ranges from 9 to 45 ft bls. The reviewer assumes an average SWL of 25 ft for the proposed well.
†The "*Well Development*" section of the application does not clearly describe proposed well construction but lists a *well depth* of 150 ft – which is crossed-through. The reviewer assumes that this is a proposed depth.

****This re-review was initiated after discussion with the Jackson County Watermaster's office where it was determined that Maple Creek be re-classified as an intermittent stream for purposes of Division 9 review in Section C of this review**

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 no OWRD observation well data near the proposed POA and the reviewer is unaware of large-scale groundwater issues in the area (e.g., pervasive dry well problems, groundwater interference issues) so there is insufficient evidence to determine groundwater over-appropriation. There are two permitted groundwater POAs in the section of the proposed POA at distances between ¼ and ½ mile. Given the geology of the area it is unlikely that there will be injury to these existing groundwater users.

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	**Weathered Bedrock of Wimer Pluton**	☐	☒
		☐	☐

Basis for aquifer confinement evaluation: Despite that the few well logs identified in the area report SWLs above 'first water', it is likely that the proposed well, with a minimum 18 ft case and seal depth, will be producing from the weathered and highly fractured upper portion of the bedrock aquifer which is likely more characteristic of an unconfined aquifer than confined. Upon completing a well however, there may be evidence that the well is producing under confined aquifer conditions. If this is the case, it is unlikely that it would change the finding of hydraulic connection or other findings in Section C.

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**	**Evans Creek**	**1035**	**1020-1030**	**~1420**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevation is slightly higher than SW elevation which suggests that GW is flowing towards and discharging to SW.

Comments: Nearby Maple Creek (aka Magerie Gulch) is not included in this evaluation of PSI because its summertime flows are augmented by irrigation return flows without which the creek would likely be intermittent or dry through much of the summer months. Therefore it is not considered a perennial surface water source and not evaluated in this review.

Water Availability Basin the well(s) are located within: Evans Cr > Rogue R – At Mouth (ID# 70987)

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**	☐	☐	**IS70987**	**20.7**	☐	**16.4**	☐	**< 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?
			☐			☐		☐		☐

Comments: Interference @ 30d was estimated using the Hunt (1999) analytical stream-depletion model. Model results for SW #2 are attached below.

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 review found that the applicant's proposed POA would be producing from an unconfined aquifer and is within 1 mile of Evans Creek (a perennial stream with two instream water rights and many surface water PODs). Calculated interference (i.e., stream-depletion) with Evans Cr. is below 1% after 30 days of pumping and so an assumption of PSI cannot be made.

References Used:

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

Wiley, T. J. 2006. *Preliminary Geologic Map of the Gold Hill and Rogue River 7.5' Quadrangles, Jackson and Josephine Counties, Oregon*. Oregon Dept. of Geol. and Mineral Industries. OFR O-06-18.

OWRD Well Log Database – accessed 08/29/2016.

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

EVANS CR > ROGUE R - AT MOUTH
ROGUE BASIN

Water Availability as of 8/29/2016

Watershed ID #: 70987 (Map) Exceedance Level: 80%
Date: 8/29/2016 Time: 9:20 AM

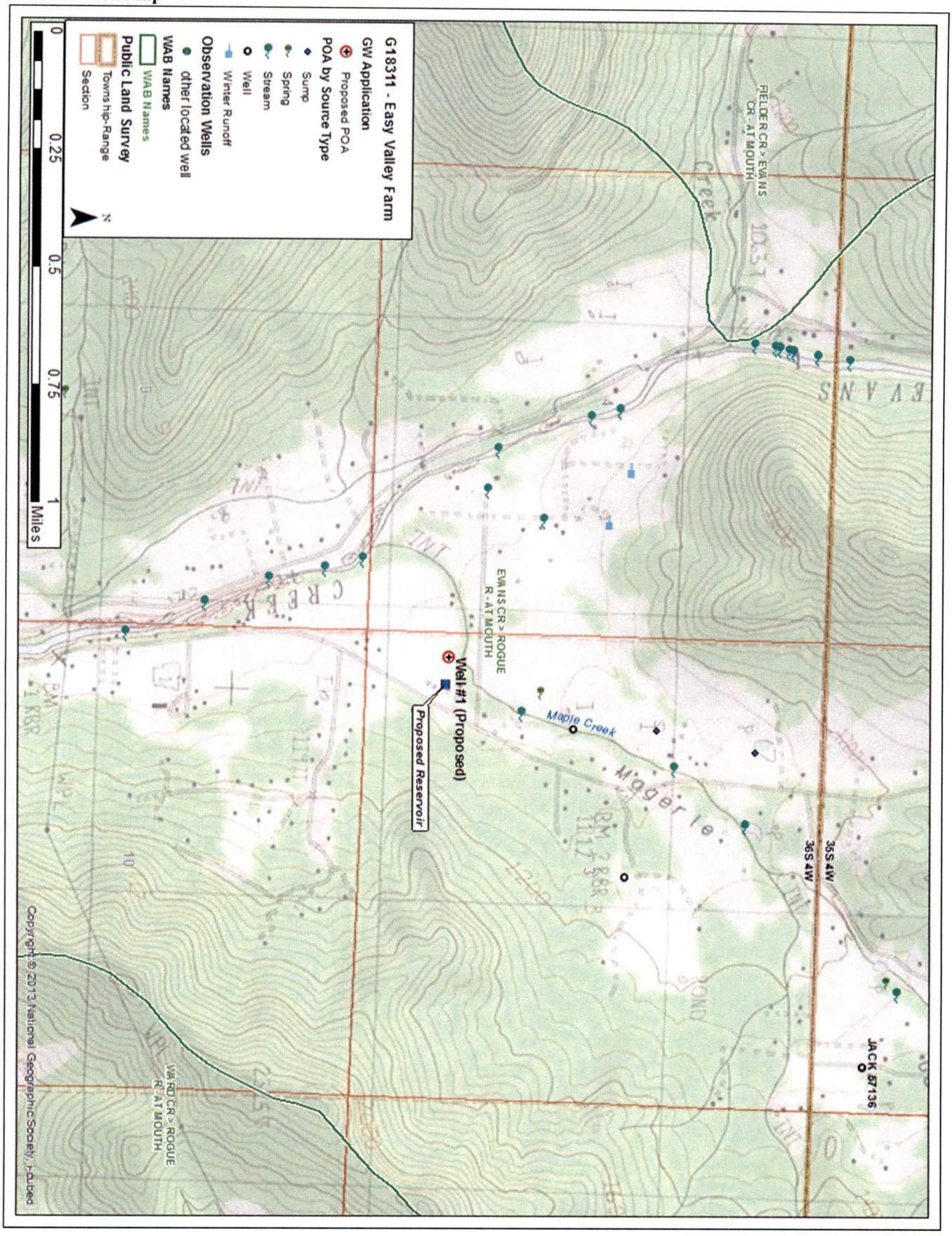
Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

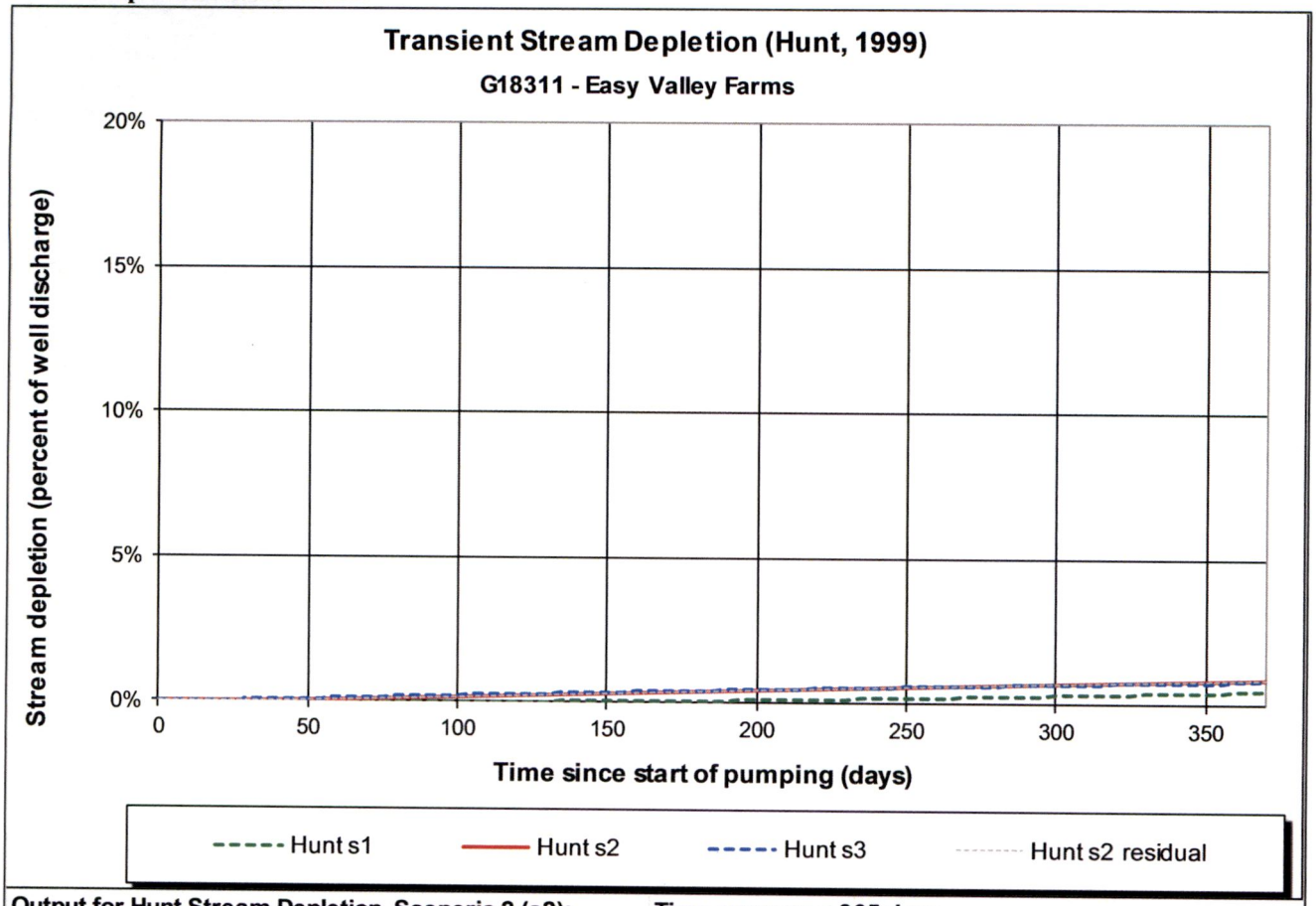
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	137.00	1.44	136.00	0.00	170.00	-34.40
FEB	268.00	1.94	266.00	0.00	170.00	96.10
MAR	200.00	1.35	199.00	0.00	170.00	28.60
APR	153.00	2.69	150.00	0.00	170.00	-19.70
MAY	83.10	4.15	78.90	0.00	105.00	-26.10
JUN	42.00	5.76	36.20	0.00	62.10	-25.90
JUL	23.20	7.65	15.60	0.00	31.00	-15.40
AUG	17.60	6.34	11.30	0.00	20.70	-9.44
SEP	16.40	4.21	12.20	0.00	75.00	-62.80
OCT	20.90	1.50	19.40	0.00	150.00	-131.00
NOV	31.40	0.35	31.00	0.00	150.00	-119.00
DEC	88.80	0.79	88.00	0.00	170.00	-82.00
ANN	124,000.00	2,310.00	122,000.00	0.00	86,900.00	51,800.00

Well Location Map



Stream-depletion Model Results



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	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
Jenk SD s2 %	**3.43**	13.44	22.17	28.99	34.38	38.75	42.37	45.42	48.04	50.32	52.33	54.12
Jen SD s2 cfs	0.005	0.020	0.033	0.043	0.052	0.058	0.064	0.068	0.072	0.075	0.078	0.081
Hunt SD s2 %	**0.01**	0.06	0.14	0.22	0.30	0.39	0.47	0.55	0.63	0.70	0.77	0.84
Hunt SD s2 cfs	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Parameters:		**Scenario 1**	**Scenario 2**	**Scenario 3**	**Units**
Net steady pumping rate	Qw	0.15	0.15	0.15	cfs
Distance to stream	a	1420	1420	1420	ft
Aquifer hydraulic conductivity	K	1	5	10	ft/day
Aquifer thickness	b	150	150	150	ft
Aquifer transmissivity	T	150	750	1500	ft*ft/day
Aquifer storage coefficient	S	0.1	0.1	0.1	
Stream width	ws	5	5	5	ft
Streambed hydraulic conductivity	Ks	0.01	0.01	0.01	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	0.017	0.017	0.017	ft/day
Stream depletion factor (Jenkins)	sdf	1344.3	268.9	134.4	days
Streambed factor (Hunt)	sbf	0.2	0.0	0.0	

THOMA Michael J * WRD

From: HAYNES Shavon L * WRD
Sent: Friday, February 17, 2017 9:22 AM
To: THOMA Michael J * WRD
Subject: RE: Appl G-18311. Initial Review and Hydraulic connection

Follow Up Flag: Follow up
Flag Status: Flagged

Michael,

It is my understanding that Maple Creek is augmented by irrigation return flows from GPID in the summer months. I feel that Maple Creek would likely be intermittent without irrigation returns.

Cheers,

Shavon L. Haynes
Assistant Watermaster
Great Southwest Region
10 South Oakdale Rm 309A
Medford, Oregon 97501
Office: (541) 774-6883
Cell: (541) 218-5125
Shavon.L.Haynes@oregon.gov
Water Rights Map Tool/WRIS/Well Log Query/
Does my property have a water right?

From: THOMA Michael J * WRD
Sent: Tuesday, February 14, 2017 10:52 AM
To: HAYNES Shavon L * WRD
Cc: GRAHAM Elisabeth A * WRD
Subject: Appl G-18311. Initial Review and Hydraulic connection

Good Morning Shavon,
The initial review for this application went out with "propose to deny" based on hydraulic connection to Maple Cr, a tributary to Evans Cr. However, it's since come to my attention that Maple Cr is not perennial and much of the summer flows are from irrigation return flows from the Grants Pass Irrigation District and not likely natural. Can you confirm, to the best of your knowledge, that summer flows in Maple Cr. augmented by irrigation return flows? And that the creek would likely be intermittent without irrigation returns?

Thanks,
- Mike

Michael J Thoma, Ph.D.
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