Groundwater Application Review Summary Form

Application # G- 18800

GW Reviewer Travis Brown **Date Review Completed:** 6/19/19

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.

✓ JT 6/20/19

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 June 19, 2019

TO: **Application G-** 18800

FROM: **GW:** Travis Brown
(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 _____ 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

OK

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18800

Date: July 1, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Travis Brown reviewed the application. Please see Travis's review and the Well Log.

Applicant's Well #1 (MARI 67957): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

The construction of Well #1 may not satisfy hydraulic connection issues.

MARI 67957

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OR 690-205-0210)

WELL I.D. LABEL# L 120925
START CARD # 215093
ORIGINAL LOG #

MARI 67957

(1) LAND OWNER
Owner Well I.D.
First Name Blake Last Name Crosby
Company crossroads llc
Address 8648 crosby rd. NE
City Woodburn State OR Zip 97071

(2) TYPE OF WORK
☒ New Well ☐ Deepening ☐ Conversion ☐ Alteration (complete 2a & 10) ☐ Abandonment(complete 5a)

(2a) PRE-ALTERATION
	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	Material	From	To	Amt	sacks/lbs
Seal:					

(3) DRILL METHOD
☐ Rotary Air ☐ Rotary Mud ☒ Cable ☐ Auger ☐ Cable Mud
☐ Reverse Rotary ☐ Other

(4) PROPOSED USE
☐ Domestic ☒ Irrigation ☐ Community ☐ Industrial/ Commericial ☐ Livestock ☐ Dewatering ☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION
Special Standard ☐ (Attach copy)
Depth of Completed Well 343 ft.

BORE HOLE

Dia	From	To
20	0	37
16	37	343

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite Chips	0	37	41	S
		Calculated	29	
		Calculated		

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other Oar 690-210-0340
Backfill placed from ft. to ft. Material
Filter pack from 297 ft. to 343 ft. Material 1/8 to 3/8 Size pea gravel
Explosives used: ☐ Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Pounds Actual Amount Pounds

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
◉	○	16	☒	2	297.33	375	◉	○	☒	
○	◉	12	☐	258	343	250	◉	○	☒	
○	○		☐				○	○	☐	
○	○		☐				○	○	☐	
○	○		☐				○	○	☐	

Shoe ☐ Inside ☒ Outside ☐ Other Location of shoe(s) 297.33
Temp casing ☐ Yes Dia From To

(7) PERFORATIONS/SCREENS
Perforations Method torch
Screens Type v wire Material stainless

Perf/Screen	Casing/Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size
Screen		12	300.17	304.42	.07			12
Screen		12	304.42	308.42	.15			12
Screen		12	308.42	312.8	.25			12
Perf		12	313	324	.375	6	132	12
Perf		12	324	336	.5	6	142	12

(8) WELL TESTS: Minimum testing time is 1 hour
◉ Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
1,100	81.3	160	2
1,100	83.2	160	5

Temperature 53 °F Lab analysis ☐ Yes By
Water quality concerns? ☐ Yes (describe below) TDS amount 88 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County MARION Twp 5 S N/S Range 2 W E/W WM
Sec 23 NW 1/4 of the SW 1/4 Tax Lot 2000
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
○ Street address of well ◉ Nearest address
7645 Jensen Rd. Gervais , OR

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	04-01-2018			37.7

Flowing Artesian? ☐ Dry Hole? ☐

WATER BEARING ZONES Depth water was first found 121

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
01-25-2018	121	149	250			34
02-06-2018	188	205	500			35.3
02-20-2018	229	243	300			36.2
03-02-2018	299	235	2,000			37.7

(11) WELL LOG
Ground Elevation

Material	From	To
top soil	1	2
clay brown	2	20
clay grey	20	37
clay dark grey	37	72
clay dark grey , sandy hard	72	78
sand,silt, dark grey	78	109
clay brown	109	111
clay brown sandy	111	121
gravel 80% , Sand black	121	142
cemented sand and gravel	142	149
clay grey sandy	149	152
sand and silt, greenish grey	152	170
silt grey	170	188
sand and gravel	188	201
sand black	201	205
clay grey sticky	205	211
clay grey , med	211	229
gravel and sand , some clay	229	243
sand black	243	246

RECEIVED
JUN 13 2018
OWRD

Date Started 01-03-2018 Completed 04-30-2018

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number 1704 Date 05-09-2018
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 783 Date 05-09-2018
Signed Ivan Grossen
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version: 0.95

MARI 67957

WATER SUPPLY WELL REPORT - continuation page

WELL I.D. LABEL# L 120925
START CARD # 215093
ORIGINAL LOG #

MARI 67957

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
					Calculated		
					Calculated		
					Calculated		
					Calculated		

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

Perf/Screen	Casing/Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Water Quality Concerns

From	To	Description	Amount	Units

(10) STATIC WATER LEVEL

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)

(11) WELL LOG

Material	From	To
clay , greenish gery	246	249
clay brown	249	252
clay dark grey	252	257
sand black	257	259
clay dark grey	259	269
claystone grey	269	274
silt dark greenish grey	274	279
sand black	279	286
clay greenish grey	286	293
claystone soft greenish grey	293	296
silt greenish grey	296	299
gravel 70%, sand	299	335
clay greenish grey	235	343

RECEIVED
JUN 13 2018
OWRD

Comments/Remarks

bottom plate 343
lifting bar at 341.34

3" side band welded on outside of top end of 12" pipe to reinforce with centering guilds

#5

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 6/19/2019
FROM: Groundwater Section Travis Brown
Reviewer's Name
SUBJECT: Application G- 18800 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: **Crossroads Land, LLC** County: **Marion**

A1. Applicant(s) seek(s) 0.42 cfs from 1 well(s) in the Willamette Basin, Molalla-Pudding subbasin

A2. Proposed use Irrigation (25.4 acres) 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	MARI 67957	1	Alluvium	0.42	5S/2W-23 NW-SW	**App: 1600' N, 5' E fr NE cor DLC 54[a]** **OWRD: 1690' N, 85' W fr NE cor DLC 54**

* 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	185	121	39.21	3/26/2019	343	0-37	+2-297 (16")	258-300 (12") 336-343 (12")	300-313 (Scrn) 313-336 (Perf)	1,100	83.2	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is located ~0.4 miles northwest of the City of Gervais, Oregon. The maximum annual volume of appropriation for the proposed irrigated acreage is 63.5 af based on the applicable duty of 2.5 af/acre.

[a] **There appears to be a ~125 ft difference between the location of MARI 67957 (POA 1) as described in the application and the physical well location measured during a well inspection by Department staff on January 11, 2018. Both locations are included in the table above. This review uses the location provided by the Department well inspector as the most accurate location for assessing potential impacts of the proposed use.** Should the applicant correct the proposed POA location to correspond to the location identified by Department staff, an additional/revised groundwater review should not be required.

A5. ☐ **Provisions of the** Willamette 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: The proposed POA is greater than ¼ mile from the nearest surface water source and produces water from a confined aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin rules (OAR 690-502-0140) do not apply.

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: **N/A**
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 (annual measurement condition), 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 **alluvial** 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 for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.**

POA 1 (MARI 67957) produces water primarily from ~36 ft of gravel and sand between ~299 and 335 ft below land surface (bls). This gravel and sand is considered part of the Willamette Aquifer, and is overlain by interbedded clays, silts, sands, and gravels. The well log for MARI 67957 indicates several shallow sand and gravel layers between 14 and 28 ft thick. From land surface to ~121 ft bls, the well log indicates predominantly clay (the Willamette Silt of Woodward et al., 1998).

Permit G-17865 authorizes the applicant to divert up to 1.29 cfs (~579 gpm) from MARI 67957. This application requests an additional 0.42 cfs (~188 gpm) from MARI 67957 (POA 1), which would result in a total pumping rate of up to 1.71 cfs (~767 gpm) from MARI 67957. The yield reported for MARI 67957 on its water well report is 1,100 gpm (~2.45 cfs) so the well would appear to be capable of diverting the requested amount. Reported static water levels for wells completed to similar depths as MARI 67957 do not indicate persistent or widespread declines in the alluvial aquifer (see attached Hydrograph).

The nearest known water supply well completed in a water-bearing zone (WBZ) similar to POA 1 (MARI 67957) is MARI 18033, authorized POA for Certificate 89753 and Permit G-11852, ~6,365 ft north of POA 1 (MARI 67957). Theis (1935) drawdown analysis of potential well-to-well interference with MARI 18033 does not indicate that the proposed use would deprive the users of MARI 18033 of their customary use of groundwater (see Theis Drawdown at MARI 18033, attached).

POA 1 (MARI 67957) is ~200 ft southwest of the permitted location of MARI 17295, authorized POA for Permit G-11618. Although MARI 17295 also produces water from saturated sands and gravels below the Willamette Silt, MARI 17925's production zone is ~146 ft above the production zone of POA 1 (MARI 67957), with at least 60 ft of the intervening depth noted as "clay" or "claystone" in the well log for MARI 67957. These intervening clay layers may act as confining or leaky confining units, thereby insulating MARI 17295 from direct well-to-well interference due to pumping of POA 1 (MARI 67957). However, to protect the senior users of MARI 17295 and others, it is recommended that the conditions specified in B(1)(d)(i) and B(2)(c) be applied to any permit issued for the proposed use.

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 Willamette Aquifer**	☒	☐

Basis for aquifer confinement evaluation: The water well report for MARI 67957 (POA 1) indicates a static water level more than 80 feet above the first-encountered water bearing zone. Nearby water well reports likewise indicate static water levels within the depth range of the shallow, fine-grained sediments of the Willamette Silt and above the shallowest reported water bearing zones (see Water Well Statistics, attached) (Woodward et al, 1998). Based on the available evidence, the aquifer tapped by proposed POA 1 (MARI 67597) is predominantly confined.

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	**Sam Brown Creek**	**146**	**~155**	**~9,000**	☒	☐	☐	☐	☒
1	2	**Senecal Creek**	**146**	**~170**	**~11,000**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: There are no perennial stream reaches within 1 mile of POA 1 (MARI 67957).

The nearest perennial reaches of Sam Brown Creek (SW 1) and Senecal Creek (SW 2) are approximately 9,000 ft and 11,000 ft, respectively, from POA 1 (MARI 67957). The measured groundwater level elevation for POA 1 (MARI 67957) is similar enough to the surface water elevations on SW 1 and SW 2 to assume some degree of hydraulic connection. Furthermore, water table maps of the area indicate that groundwater in the alluvial aquifer system flows toward and discharges into local streams incised into the French Prairie plateau (Gannett and Caldwell, 1998). These facts indicate that the alluvial aquifer is hydraulically connected to local surface water.

Water Availability Basin the well(s) are located within: SW 1: PUDDING R > MOLALLA R – AB MILL CR
SW 2: MILL CR > PUDDING 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?
		☐	☐			☐		☐		☐

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: Not Applicable

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**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**
Well Q as CFS		**0**	**0**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0**	**0**
Interference CFS		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
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.		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
(B) = 80 % Nat. Q		**39.20**	**53.90**	**38.40**	**27.60**	**13.70**	**8.72**	**3.79**	**2.09**	**1.88**	**2.39**	**6.05**	**25.90**
(C) = 1 % Nat. Q		**0.392**	**0.539**	**0.384**	**0.276**	**0.137**	**0.0872**	**0.0379**	**0.0290**	**0.0188**	**0.0239**	**0.0605**	**0.259**
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**	**~0 %**

(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: SW 2 (Senecal Creek) has substantially lower 80 percent exceedance natural streamflow compared to SW 1 (Sam Brown Creek). Therefore, interference with SW 2 has been evaluated as the conservative case, despite SW 1 being closer to POA 1 (MARI 67957).

Potential depletion of (interference with) SW 2 by the proposed use was estimated using the Hunt (2003) analytical stream depletion model. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2003, 2005; Iverson, 2002; McFarland and Morgan, 1996; Woodward et al., 1998) or are within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Domenico and Mifflin, 1965). The well pumping rate for the analysis was determined by distributing the combined maximum annual volume of appropriation (321.25 af) over the total season of use (245 days).

The Hunt (2003) model results indicate that depletion of SW 2 is expected to be negligible one year after the proposed use begins. The thick deposits of low-permeability Willamette Silt overlying the Willamette Aquifer in this area and the relatively great distance from the POA to hydraulically-connected surface water provide an effective buffer from stream depletion effects within the period of 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 use is not anticipated to have the potential for substantial interference with nearby surface water.

References Used:

Application File: G-18800, G-18383

Permit G-11618

Pumping Test Files: MARI 1901, 2437, 2614, 2634, 2651, 2655, 2656, 2659, 2681, 18489, 18805, 53043

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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:** _____

_____

_____

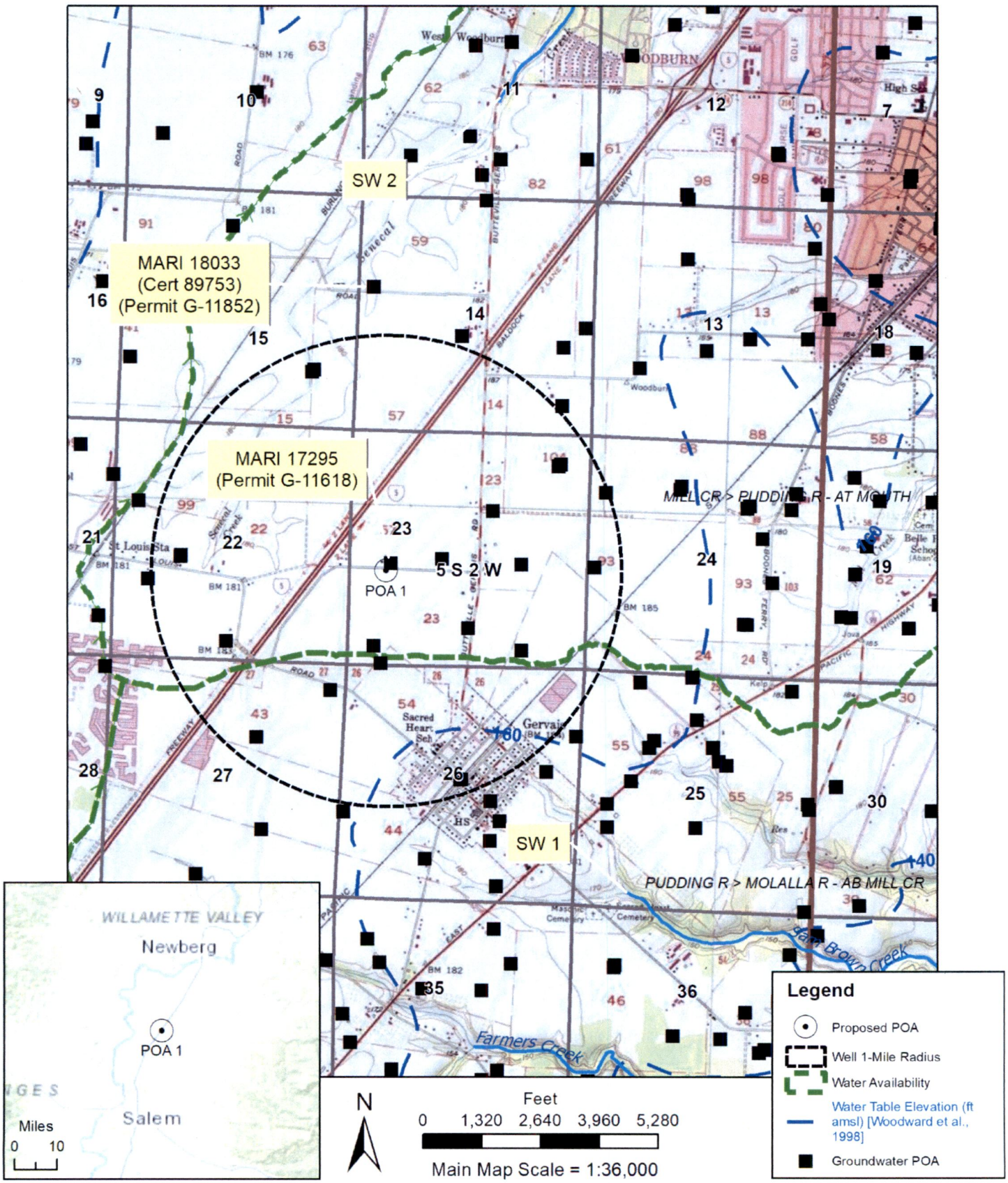
_____

_____

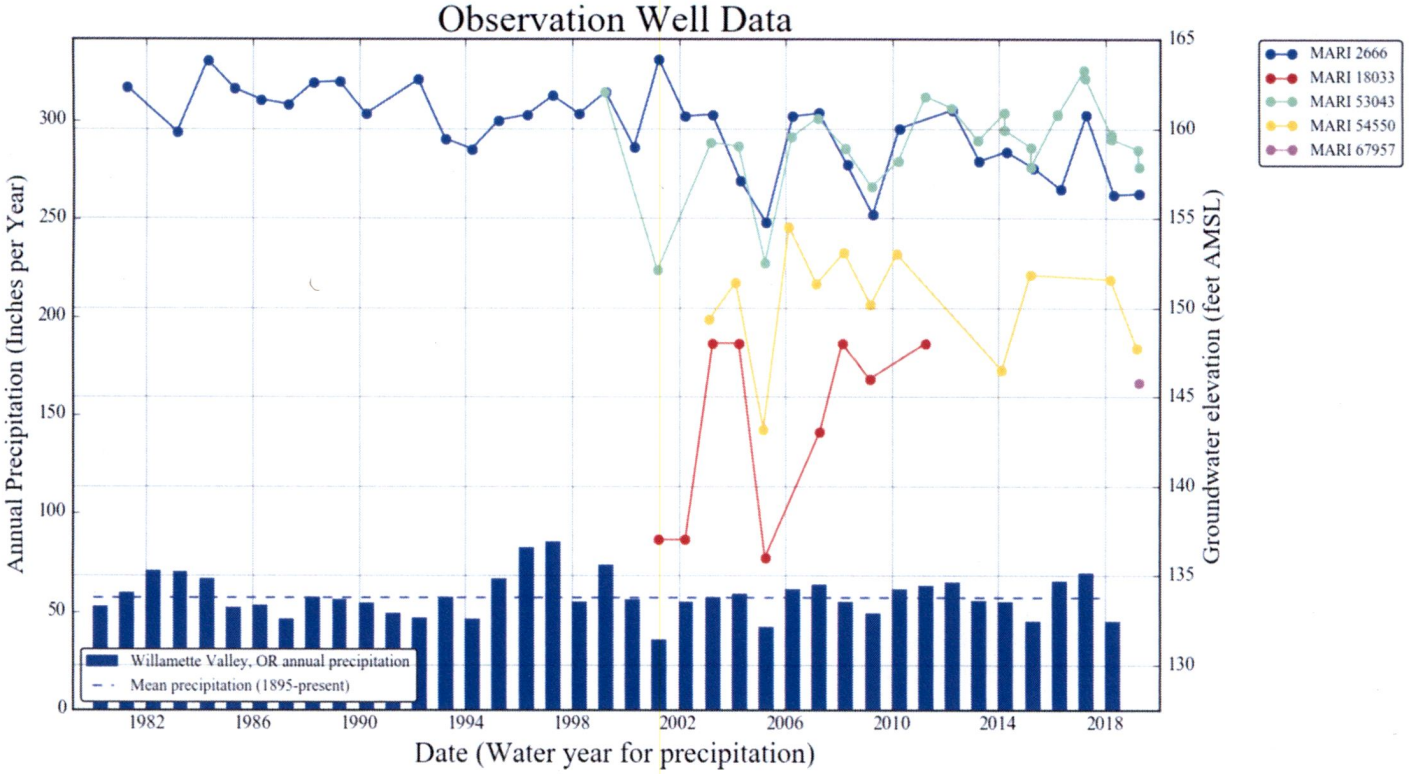
D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Well Location Map

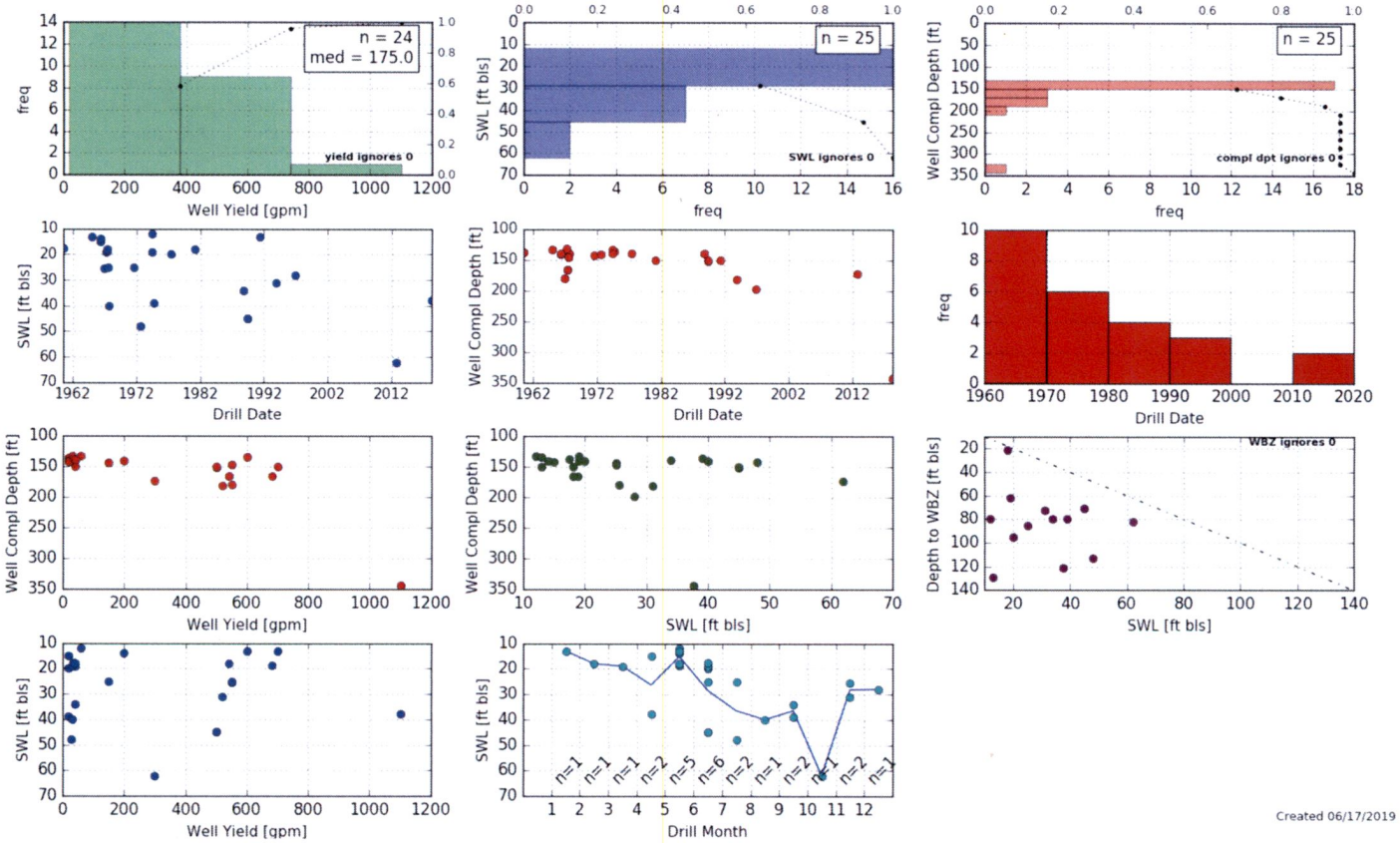
G-18800 Crossroads Land, LLC



Hydrographs – Annual Precipitation and Annual Spring Water Levels for Obs Wells > 250 ft bls



Water Well Statistics – T5S/R2W-23



Theis Drawdown at MARI 18033

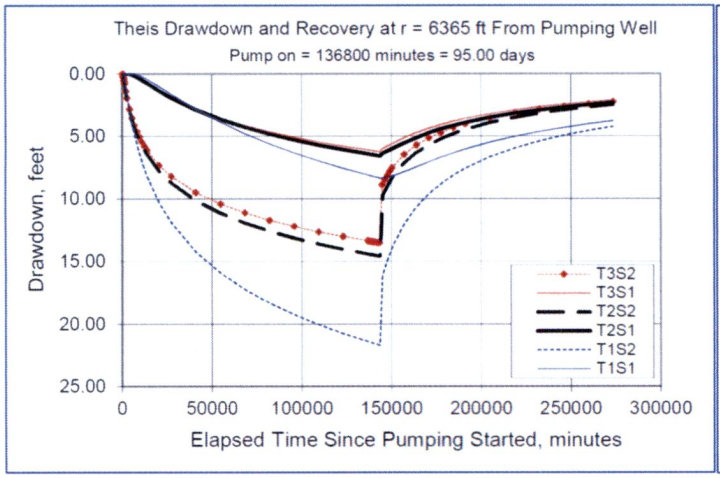
Theis Time-Drawdown Worksheet v.3.00

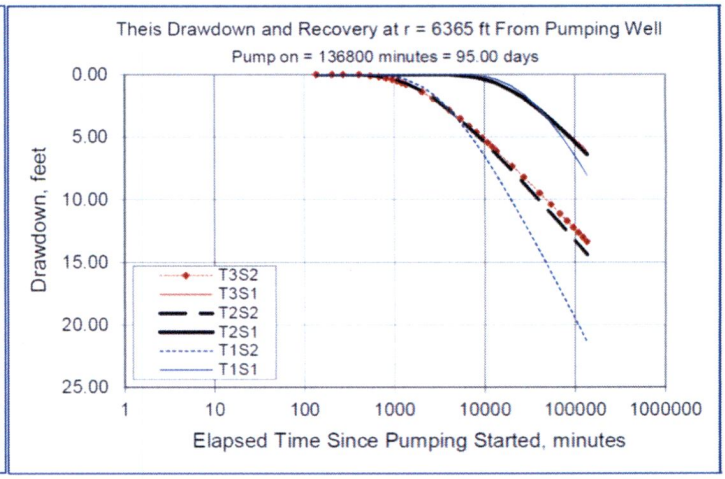
Calculates Theis nonequilibrium drawdown and recovery at any arbitrary radial distance, r, from a pumping well for 3 different T values and radial distance, r, from a pumping well for 3 different T values and 2 different S values.

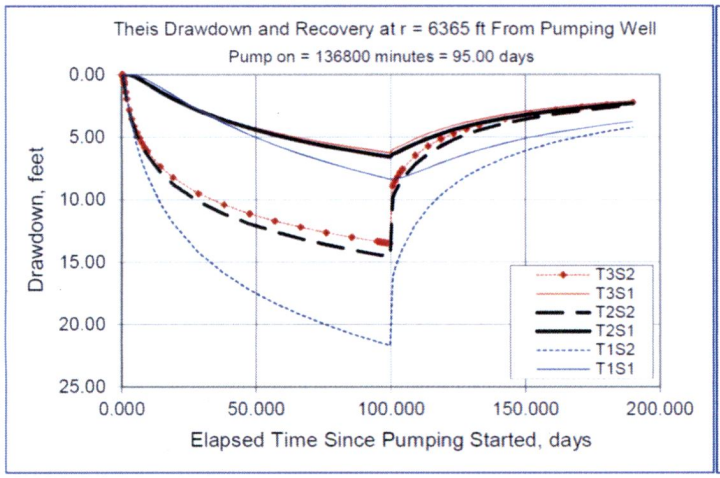
Written by Karl C. Wozniak September 1992. Last modified December 30, 2014

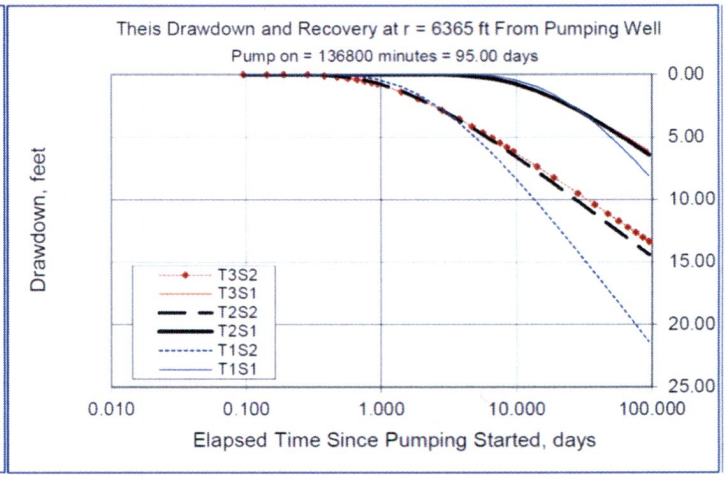
Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		95		d	
Radial distance from pumped well:	r		6365.00		ft	Q conversions
Pumping rate	Q		767.0		gpm	767.00 gpm
Hydraulic conductivity	K	48	81	90	ft/day	1.71 cfs
Aquifer thickness	b		40		ft	102.54 cfm
Storativity	S_1		0.00320			147,657.75 cfd
	S_2		0.00032			3.39 af/d
Transmissivity Conversions	T_f2pd	1,900	3,255	3,600	ft2/day	
	T_ft2pm	1.3194	2.2604	2.5000	ft2/min	
	T_gpdpft	14,212	24,347	26,928	gpd/ft	

Use the Recalculate button if recalculation is set to manual









- Total pumping time represents time to reach combined maximum annual volume (321.25 af) at combined rate of 767 gpm (1.71 cfs).
- Transmissivity values represent 25th, 50th (median), and 75th percentile values from analyzed pumping tests.
- Storativity representative of sand and gravel aquifer (Domenico and Mifflin, 1965).

Water Availability Tables

Water Availability Analysis
Detailed Reports

MILL CR > PUDDING R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 6/18/2019

Watershed ID #: 30200901 (Map)
Date: 6/18/2019

Exceedance Level: 80%
Time: 1:41 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	39.20	9.82	29.40	0.00	0.00	29.40
FEB	53.90	9.97	43.90	0.00	0.00	43.90
MAR	38.40	9.53	28.90	0.00	0.00	28.90
APR	27.60	7.12	20.50	0.00	0.00	20.50
MAY	13.70	5.68	8.02	0.00	0.00	8.02
JUN	8.72	6.94	1.78	0.00	0.00	1.78
JUL	3.79	10.60	-6.83	0.00	0.00	-6.83
AUG	2.09	8.64	-6.55	0.00	0.00	-6.55
SEP	1.88	4.72	-2.84	0.00	0.00	-2.84
OCT	2.39	1.25	1.14	0.00	0.00	1.14
NOV	6.05	7.24	-1.19	0.00	0.00	-1.19
DEC	25.90	9.63	16.30	0.00	0.00	16.30
ANN	30,000.00	5,500.00	25,300.00	0.00	0.00	25,300.00

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN

Water Availability as of 6/18/2019

Watershed ID #: 151 (Map)
Date: 6/18/2019

Exceedance Level: 80%
Time: 2:11 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	1,040.00	125.00	915.00	0.00	36.00	879.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	76.10	934.00	0.00	36.00	898.00
APR	787.00	51.90	735.00	0.00	36.00	699.00
MAY	425.00	49.90	375.00	0.00	36.00	339.00
JUN	224.00	71.50	153.00	0.00	36.00	117.00
JUL	109.00	112.00	-3.34	0.00	36.00	-39.30
AUG	71.00	92.00	-21.00	0.00	36.00	-57.00
SEP	67.30	52.20	15.10	0.00	36.00	-20.90
OCT	91.60	11.10	80.50	0.00	36.00	44.50
NOV	363.00	48.50	314.00	0.00	36.00	278.00
DEC	957.00	118.00	839.00	0.00	36.00	803.00
ANN	706,000.00	55,700.00	650,000.00	0.00	26,100.00	626,000.00

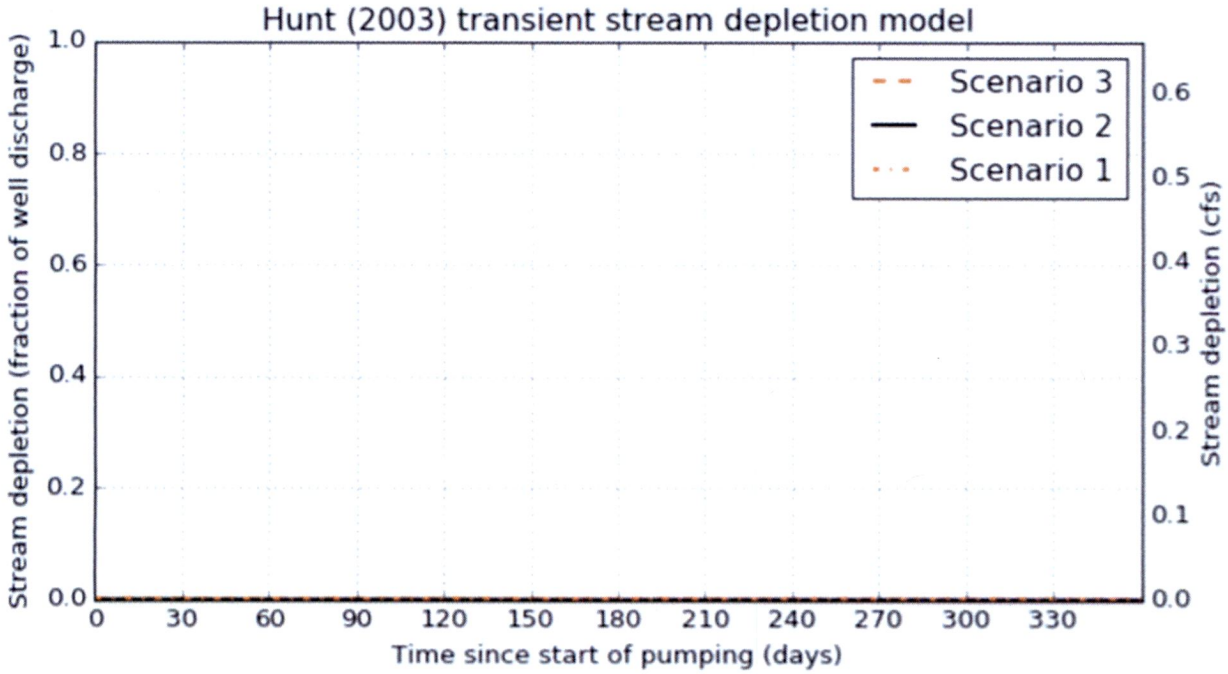
Stream Depletion Analysis – SW 1

Application type:	G
Application number:	18800
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.66
Pumping duration (days):	245.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	9000.0	9000.0	9000.0	ft
Aquifer transmissivity	T	1900.0	3255.0	3600.0	ft2/day
Aquifer storativity	S	0.0032	0.001	0.00032	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.0032	0.01	ft/day
Aquitard saturated thickness	ba	260.0	190.0	80.0	ft
Aquitard thickness below stream	babs	260.0	190.0	80.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	15.0	15.0	15.0	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Stream Depletion Analysis – SW 2

Application type:	G
Application number:	18800
Well number:	1
Stream Number:	2
Pumping rate (cfs):	0.66
Pumping duration (days):	245.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	11000.0	11000.0	11000.0	ft
Aquifer transmissivity	T	1900.0	3255.0	3600.0	ft2/day
Aquifer storativity	S	0.0032	0.001	0.00032	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.0032	0.01	ft/day
Aquitard saturated thickness	ba	260.0	190.0	80.0	ft
Aquitard thickness below stream	babs	260.0	190.0	80.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	15.0	15.0	15.0	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00