Approved:

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Travis Kelly, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18818

Date: April 10, 2020

The attached application was forwarded to the Well Construction and Compliance Section by the Ground Water Section. Phil Marcy reviewed the application. Please see Phil's Groundwater Review and the Well Logs.

Applicant's Well #1 (LINN 62889): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

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

LINN 62889

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

WELL I.D. LABEL# L 134778
START CARD # 1044664
ORIGINAL LOG #

LINN 62889

(1) LAND OWNER
Owner Well I.D. 6053
First Name Amy Last Name Doerfler
Company K2A Properties LLC
Address 12333 Silver Falls Hwy SE
City Aumsville State OR Zip 97325

(2) TYPE OF WORK
[X] 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
[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE
[ ] Domestic [X] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [ ] (Attach copy)
Depth of Completed Well 110 ft.

BORE HOLE

Dia	From	To
16	0	63
12	63	110

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite	11	18	24	S
		Calculated	5.5	
Cement	0	11	15	S
		Calculated	5.5	

How was seal placed. Method [ ] A [ ] B [X] C [ ] D [ ] E
[X] Other Poured dry
Backfill placed from ft. to ft. Material
Filter pack from ft. to ft. Material Size
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
◉	○	12	[X]	1	63	250	◉	○	[X]	[ ]
○	○		[ ]				○	○	[ ]	[ ]
○	○		[ ]				○	○	[ ]	[ ]
○	○		[ ]				○	○	[ ]	[ ]
○	○		[ ]				○	○	[ ]	[ ]

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)
Temp casing [X] Yes Dia 16 From 0 To 63

(7) PERFORATIONS/SCREENS
Perforations Method Torch cut
Screens Type Material

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Casing	12	19	63	.375	12	600	

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

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
1,050	7	30	4

Temperature 61 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 170

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County LINN Twp 10 S N/S Range 2 W E/W WM
Sec 20 NW 1/4 of the NW 1/4 Tax Lot 300
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
◉ Street address of well ○ Nearest address
38331 Densmore Dr. - Jefferson, OR 97352

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration			[ ]	
Completed Well	09-05-2019	5	[X]	11

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 18

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
09-05-2019	18	110	2,000			11

(11) WELL LOG
Ground Elevation

Material	From	To
Topsoil	0	2
Cobbles & clay	2	5
Brown clay	5	18
Gravel & sand	18	25
Gravel cemented	25	30
Gravel & sand	30	40
Cemented gravel	40	52
Red clay	52	56
Gravel cemented	56	60
Clay w/some gravel	60	65
Cemented gravel	65	95
Red clay & gravel	95	105
Cemented gravel	105	110
Jones Drilling Co., Inc.		
29400 Santiam Hwy		
Lebanon, OR 97355		
1-800-915-8388		

RECEIVED
OCT 04 2019
OWRD

Date Started 08-26-2019 Completed 09-05-2019

(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 1411 Date 09-26-2019
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 1684 Date 09-26-2019
Signed
Contact Info (optional) jonesdrilling@hotmail.com

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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/08/2020
FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name
SUBJECT: Application G- 18818 Supersedes review of 08/05/2019
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: **Amy Doerfler/KZA Properties LLC** County: **Linn**

A1. Applicant(s) seek(s) 0.25 cfs from 2 well(s) in the Willamette Basin, _____ subbasin

A2. Proposed use Irrigation (52 acres) Seasonality: March 1st – October 31st (245 days)

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	LINN 62889	1	Alluvium	0.25	10S/2W-20 SW-NW	904' S, 957' E FR NW COR, S20
2						
3						
4						

* 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	241	18	11	09/05/2019	110	0-18	0-19	NA	19-63	1050	7	Pump

Use data from application for proposed wells.

A4. **Comments:** This re-review considers a newly constructed well (LINN 62889) drilled as a replacement for both proposed wells (LINN 4221 and LINN 4219) after well construction compliance issues were identified. In addition, the proposed rate has been lowered to 0.25 cfs from the original request of 0.65 cfs to avoid a finding of PSI.

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: _____

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 nearest observation well with a significant period of record is MARI 50649, about 14,000 feet to the NE of proposed POA well. The hydrograph for this well displays minimal fluctuations, and no discernable decline during the period of record (see attached hydrograph).

The area beneath the proposed irrigated lands and POA well is underlain by 60-70 feet of coarse-grained Holocene floodplain deposits associated with the Santiam River. The water table occurs at shallow depths and groundwater levels approximate the stage of adjacent reaches of the river. The alluvial floodplain aquifer is unconfined and highly permeable.

The nearest irrigation well to the proposed POA well is greater than 1,000', and given the high transmissivity and storage capacity of the unconfined alluvium here, minimal interference is expected to nearby users resulting from issuance of this permit.

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	**Sand and gravel**	☐	☒
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The proposed POA well produces from shallow depths within the Holocene alluvial aquifer, which lacks any evidence of a laterally continuous confining horizon, all wells of similar depth in the area display heads nearly equivalent with the depth at which water was first encountered.

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**	**Thomas Creek**	**230**	**230-245**	**2890**	☒	☐	☐	☐	☒
1	**2**	**South Santiam River**	**230**	**242-223**	**3550**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Published water table contour maps show that groundwater flows westward toward, and discharges into, the Santiam River. The floodplain aquifer and the streambed are largely composed of permeable sands and gravels so groundwater should be able to move freely between the stream and the aquifer.

Water Availability Basin the well(s) are located within: S SANTIAM R > SANTIAM R - AT MOUTH (ID# 30200601); THOMAS CR > S SANTIAM R – AT MOUTH (ID# 171)

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**	☐	☐	**MF171A**	**25.0**	☐	**33.8**	☐	**13.62**	☐
1	**2**	☐	☐	**NA**	**NA**	☐	**253**	☐	**10.78**	☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: The proposed POA well is located within the South Santiam Water Availability Basin (WAB), however is adjacent to the smaller Thomas Creek WAB, and less than 1 mile from Thomas Creek. There is no evidence of a hydrologic divide between these two WABs. On this basis, both stream reaches and their respective WAB characteristics were evaluated under Division 9 rules. The proposed pumping rate has been lowered to 0.25 cfs, which is 1% of instream right MF171A, and below 1% of the 80% exceedance for Thomas Creek during the lowest flow month. On this basis, there is no finding of PSI with Thomas Creek due to pumping at the proposed POA location as described.

An analytical (Hunt, 1999) model was used to estimate stream interference after 30 days of pumping. A value of 1000 ft/day was used for the hydraulic conductivity of the Holocene floodplain sediments based on the high yields and high specific capacity of nearby wells and field observations and mapped descriptions that show the unit to be unconsolidated sand and gravel. Streambed conductivity was assumed to be 1 feet per day, the equivalent of a silty sand. A sand and gravel streambed is more likely based on field observations in other areas.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
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.												
(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: This section does not apply.

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 rate of 0.65 cfs on the original application has been reduced to 0.25 cfs from newly constructed well LINN 62889, thus lowering the potential impacts to Thomas Creek and avoiding PSI.

References Used:

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

S SANTIAM R > SANTIAM R - AT MOUTH
Watershed ID #: 30200601 Basin: WILLAMETTE Exceedance Level: 80
Time: 2:47 PM Date: 05/07/2019

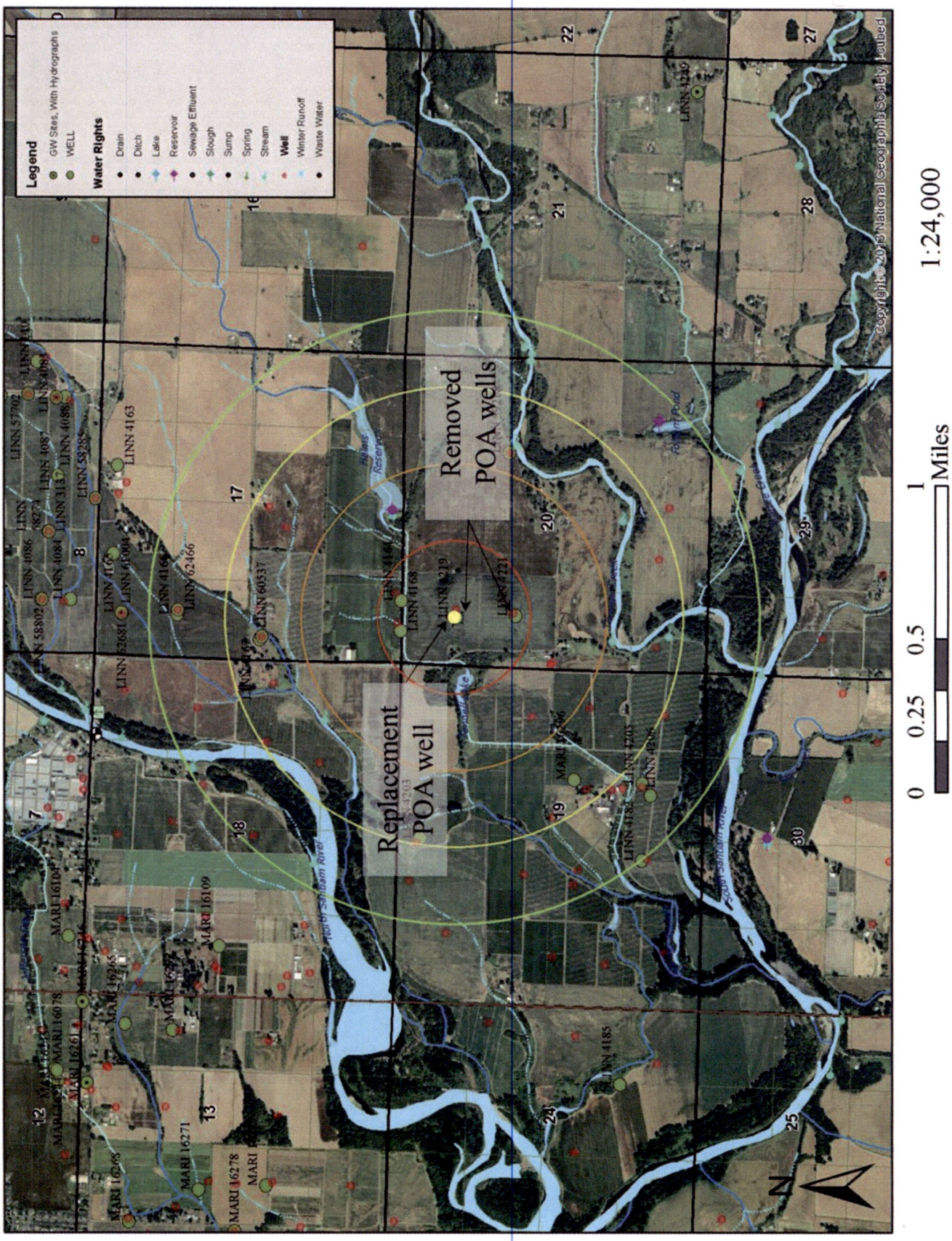
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	3,090.00	266.00	2,820.00	0.00	0.00	2,820.00
FEB	3,360.00	1,530.00	1,830.00	0.00	0.00	1,830.00
MAR	3,170.00	1,250.00	1,920.00	0.00	0.00	1,920.00
APR	2,950.00	1,050.00	1,900.00	0.00	0.00	1,900.00
MAY	2,050.00	711.00	1,340.00	0.00	0.00	1,340.00
JUN	968.00	182.00	786.00	0.00	0.00	786.00
JUL	450.00	204.00	246.00	0.00	0.00	246.00
AUG	275.00	189.00	86.10	0.00	0.00	86.10
SEP	253.00	159.00	94.40	0.00	0.00	94.40
OCT	363.00	137.00	226.00	0.00	0.00	226.00
NOV	1,450.00	139.00	1,310.00	0.00	0.00	1,310.00
DEC	3,040.00	143.00	2,900.00	0.00	0.00	2,900.00
ANN	2,330,000	355,000	1,980,000	0	0	1,980,000

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

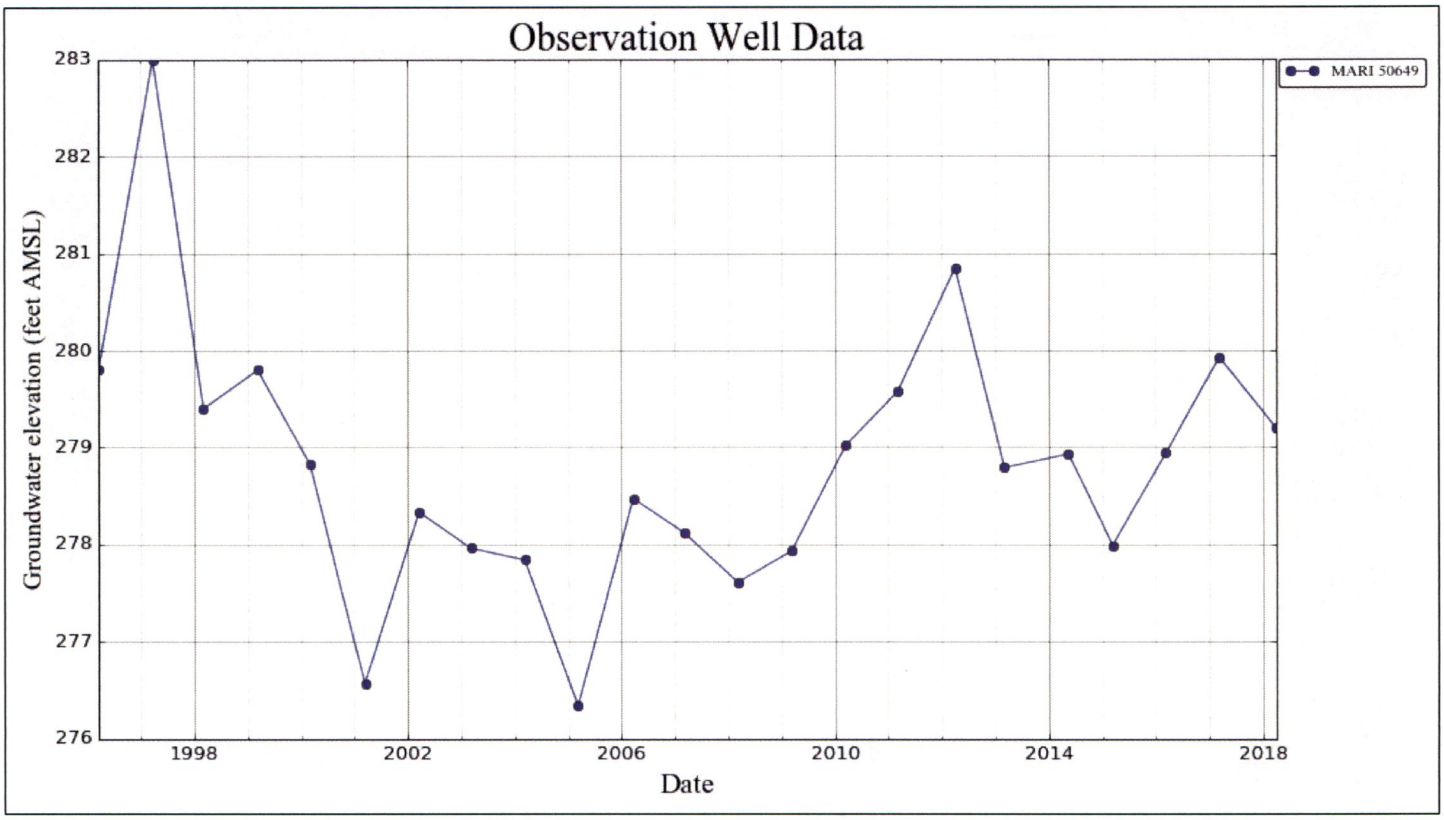
THOMAS CR > S SANTIAM R - AT MOUTH
Watershed ID #: 171 Basin: WILLAMETTE Exceedance Level: 80
Time: 11:34 AM Date: 06/24/2019

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	467.00	3.43	464.00	0.00	100.00	364.00
FEB	465.00	3.42	462.00	0.00	100.00	362.00
MAR	447.00	2.98	444.00	0.00	100.00	344.00
APR	380.00	3.74	376.00	0.00	100.00	276.00
MAY	221.00	9.67	211.00	0.00	100.00	111.00
JUN	120.00	17.20	103.00	0.00	50.00	52.80
JUL	51.50	27.00	24.50	0.00	35.00	-10.50
AUG	33.80	22.10	11.70	0.00	25.00	-13.30
SEP	35.70	12.50	23.20	0.00	100.00	-76.80
OCT	56.30	3.43	52.90	0.00	100.00	-47.10
NOV	208.00	3.17	205.00	0.00	100.00	105.00
DEC	424.00	3.44	421.00	0.00	100.00	321.00
ANN	307,000	6,800	300,000	0	60,900	244,000

Well Location Map



Water-Level Trends in Nearby Wells


Observation Well Data
MARI 50649
Groundwater elevation (feet AMSL)
283
282
281
280
279
278
277
276
1998
2002
2006
2010
2014
2018
Date