

# Groundwater Application Review Summary Form

Application # G- 18731

GW Reviewer Abrora Bouchier Date Review Completed: 2/5/2019

## 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:

[X] 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 2/5/2019  
 FROM: Groundwater Section Aurora C Bouchier  
 Reviewer's Name  
 SUBJECT: Application G- 18731 Supersedes review of na  
 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: Michael & Montra Vannett County: Lane

A1. Applicant(s) seek(s) 1.50 cfs from 2 well(s) in the Willamette Basin,  
Upper Willamette – Long Tom River watershed subbasin

A2. Proposed use Nursery (30 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	1	Alluvium	0.75	17S/5W-3 SW-NE	1560' S, 1350' W fr NE cor S 3
2	Proposed	2	Alluvium	0.75	17S/5W-3 SW-NE	2070' Sm 1350' W fr NE cor S 3
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	380				Est 160	Est 0-18				336		
2	375				Est 160	Est 0-18				336		

Use data from application for proposed wells.

A4. **Comments:** The wells are not yet constructed. The application is requesting a per well rate of 336 gpm (~0.75 cfs) for a total of 672 gpm (1.5 cfs).

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 wells are not within 1/4-mile of any perennial surface water features so pertinent basin rules (OAR 690-502-0240) do not apply.

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, 7T, 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 proposed wells will be producing from the weathered terrace gravels (QTg) (O’Connor, et al., 2001), alternately referred to as the Willamette Aquifer / Willamette Confining Unit (Woodward et al., 1998). These sediments constitute a total thickness of approximately 80-100 ft in the area and are underlain by older, consolidated marine sedimentary rocks. **In general, the QTg deposits do not host a regionally important groundwater source (O’Connor, et al., 2001). This generalized statement is supported by an examination of well logs for nearby wells similarly located in the weathered terrace gravels (eastern half of Section 3), which generally report low to moderate yields (10-80 gpm) – significantly less than the requested rate of 336 gpm per well (see Well Statistics below for wells in the eastern half of Section 3).**

The nearest State Observation Well (LANE 13051, located approximately 2.7-miles to the southeast) has water level data from the 1960’s through present and shows no water-level declines. This well is likely completed into the same aquifer system as the applicant’s proposed wells and the data imply that groundwater is not over appropriated in the area / the groundwater and surface waters are hydraulically connected.

**Special Conditions:**

In the event that either well on this review is for uses in addition to this specific permitted use (e.g., domestic, commercial, other existing permitted uses), a flow meter shall be installed such that only the use identified by this permit is being measured.

**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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Alluvium	<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"/>

**Basis for aquifer confinement evaluation:** The logs for nearby wells generally list *Static Water Levels* multiple tens of feet above the zone at which water was encountered, indicating confined conditions.

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	Coyote Creek	~365-375	340-343	2460	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Coyote Creek	~365-375	340-343	2720	<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"/>

**Basis for aquifer hydraulic connection evaluation:** Coincident GW and SW elevations; alluvial nature of aquifer with no obvious, laterally-extensive confining layer to restrict vertical groundwater movement.

**Water Availability Basin the well(s) are located within:** 114 [LONG TOM R > WILLAMETTE R - AB 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"/>	Na	Na	<input type="checkbox"/>	32.10	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	Na	Na	<input type="checkbox"/>	32.10	<input checked="" type="checkbox"/>	<25%	<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"/>

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?
	<b>1</b>	<input type="checkbox"/>	<b>Na</b>	<b>Na</b>	<input type="checkbox"/>	<b>32.10</b>	<input checked="" type="checkbox"/>	<b>&lt;25%</b>	<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"/>

**Comments:** The total maximum rate requested is 336 gpm (0.75 cfs) for each well.

Despite the finding that the wells produce from a confined aquifer in Section C1, the Hunt 1999 analytical model was used because there is not likely a continuous, thick confining layer within the sediments – which would advocate the use of the Hunt 2003 Model. The Hunt 1999 Model is a better representation of the aquifer as a thick sequence of layered strata with bulk hydrologic properties. The Hunt 1999 Model was used to estimate stream depletion for the well-stream pair from table C2 with the smallest distance (see results below). The hydrogeology will be similar for all other well-stream pairs so evaluating against the shortest distance provides an estimate of the maximum interference from the proposed use. Hydrogeologic material parameter values were taken from Herrera et al. (2014).

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.

<b>Non-Distributed Wells</b>													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
	Well Q as CFS												
	Interference CFS												
<b>Distributed Wells</b>													
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.													
(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:** \_\_\_\_\_

Groundwater and surface water are hydraulically connected in this environment. The Long Tom River and its tributaries, including Coyote Creek, are classified (OAR 690-502-0090).

**References Used:** \_\_\_\_\_

Application file: G-18731

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, 32p.

O'Connor, J. E., Sarna-Wojcicki, A., Wozniak, K. C., Polette, D. J., and Fleck, R. J., 2001, Geologic map of Quaternary units in the Willamette Valley, Oregon: Reston, Va., U.S. Geological Survey, Professional Paper 1620, map scale 1:250,000.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82p.

OWRD Well Log and Water Level Database.

**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.**

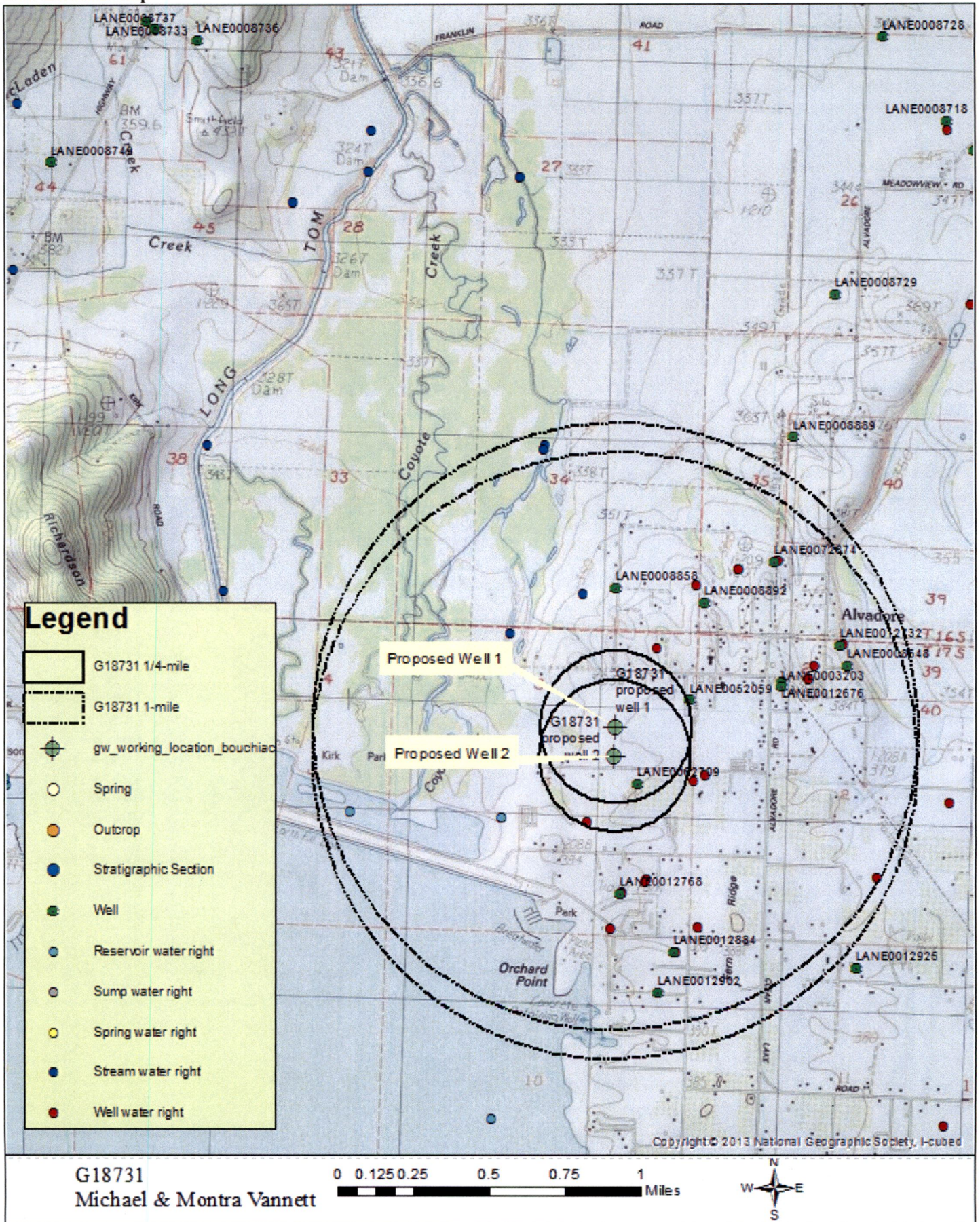
**Water Availability Tables**

WATER AVAILABILITY TABLE															
watershed ID #: 114		LONG TOM R > WILLAMETTE R - AB MOUTH								Exceedance Level: 80					
Time: 12:57 PM		Basin: WILLAMETTE								Date: 01/17/2019					
# watershed	Nest ID Number	Stream Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	STOR
1	181	WILLAMETTE R > COLUMBIA R - AT MOUTH	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
2	182	WILLAMETTE R > COLUMBIA R - AB MOLALLA R	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
3	183	WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
4	30200321	WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
5	114	LONG TOM R > WILLAMETTE R - AB MOUTH	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES

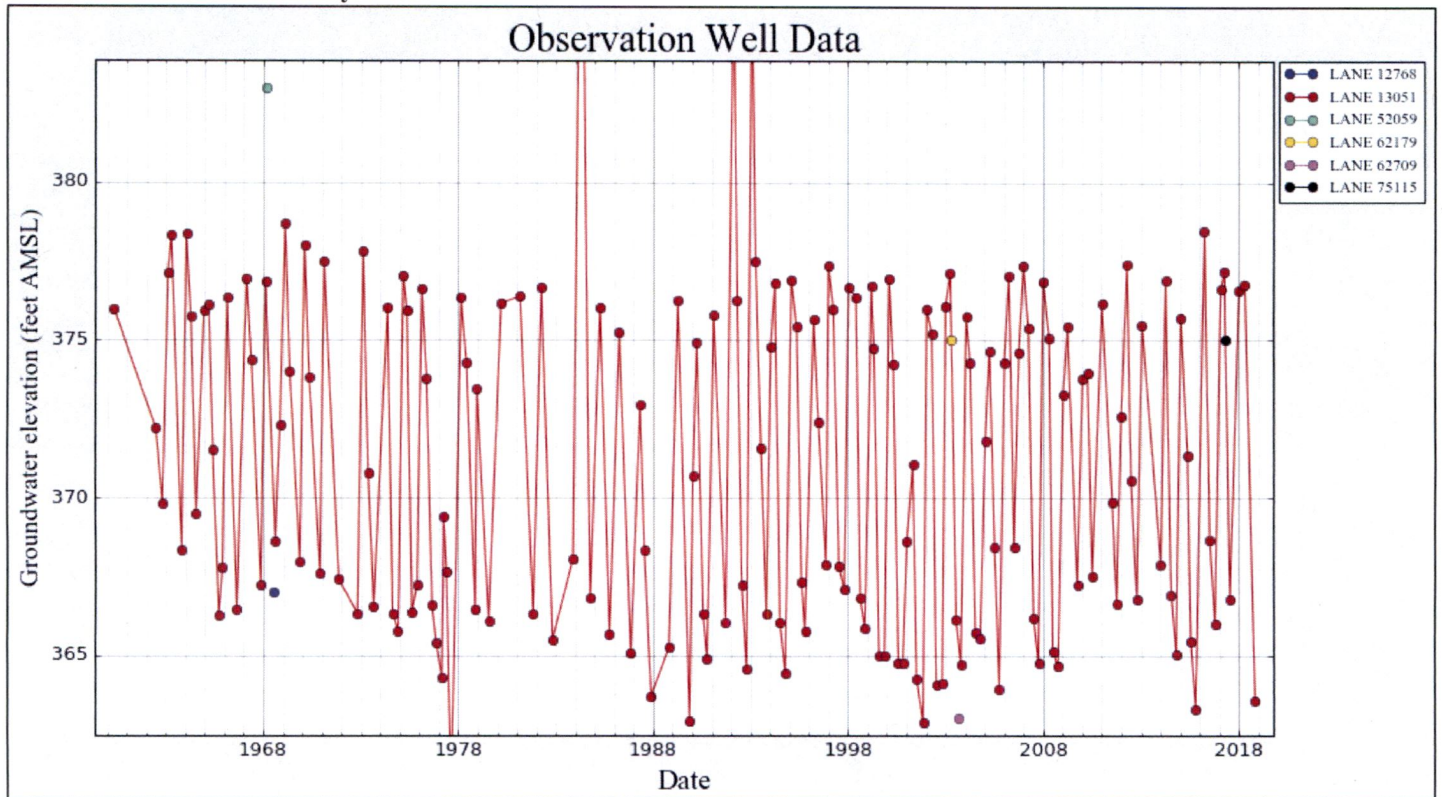
DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION							
watershed ID #: 114		LONG TOM R > WILLAMETTE R - AB MOUTH				Exceedance Level: 80	
Time: 12:57 PM		Basin: WILLAMETTE				Date: 01/17/2019	
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net water Available	
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.							
JAN	568.00	149.00	419.00	0.00	0.00	419.00	
FEB	697.00	388.00	309.00	0.00	0.00	309.00	
MAR	596.00	555.00	41.20	0.00	0.00	41.20	
APR	373.00	249.00	124.00	0.00	0.00	124.00	
MAY	215.00	63.70	151.00	0.00	0.00	151.00	
JUN	105.00	29.20	75.80	0.00	0.00	75.80	
JUL	50.60	47.40	3.24	0.00	0.00	3.24	
AUG	35.40	38.40	-3.00	0.00	0.00	-3.00	
SEP	32.10	21.10	11.00	0.00	0.00	11.00	
OCT	35.30	5.53	29.80	0.00	0.00	29.80	
NOV	82.50	5.28	77.20	0.00	0.00	77.20	
DEC	364.00	105.00	259.00	0.00	0.00	259.00	
ANN	362,000	99,200	262,000	0	0	262,000	



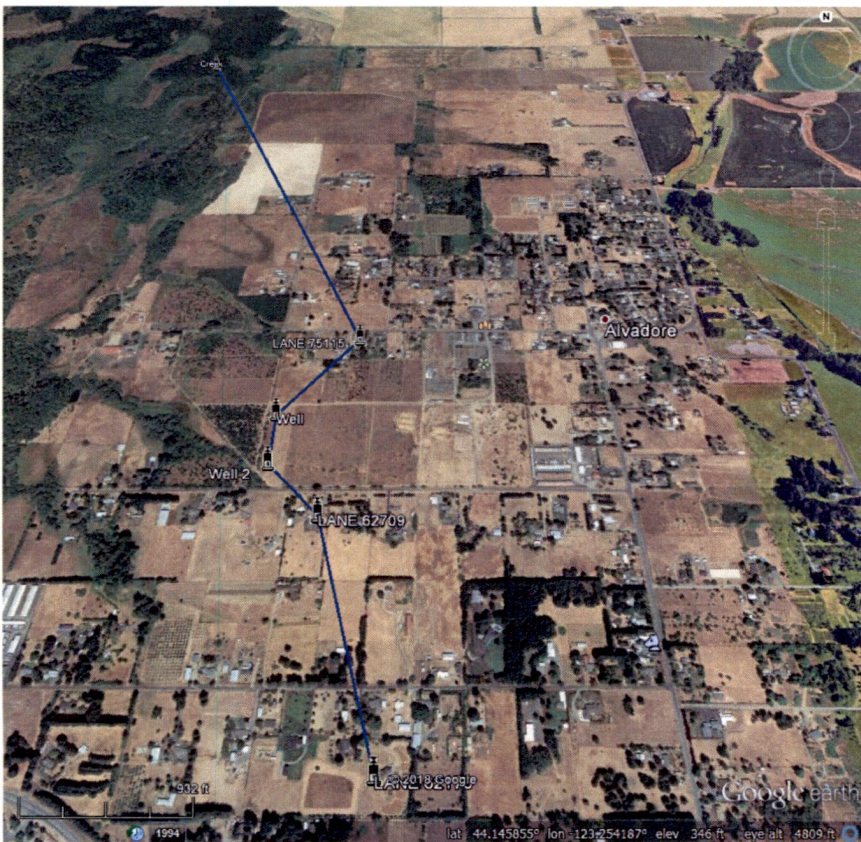
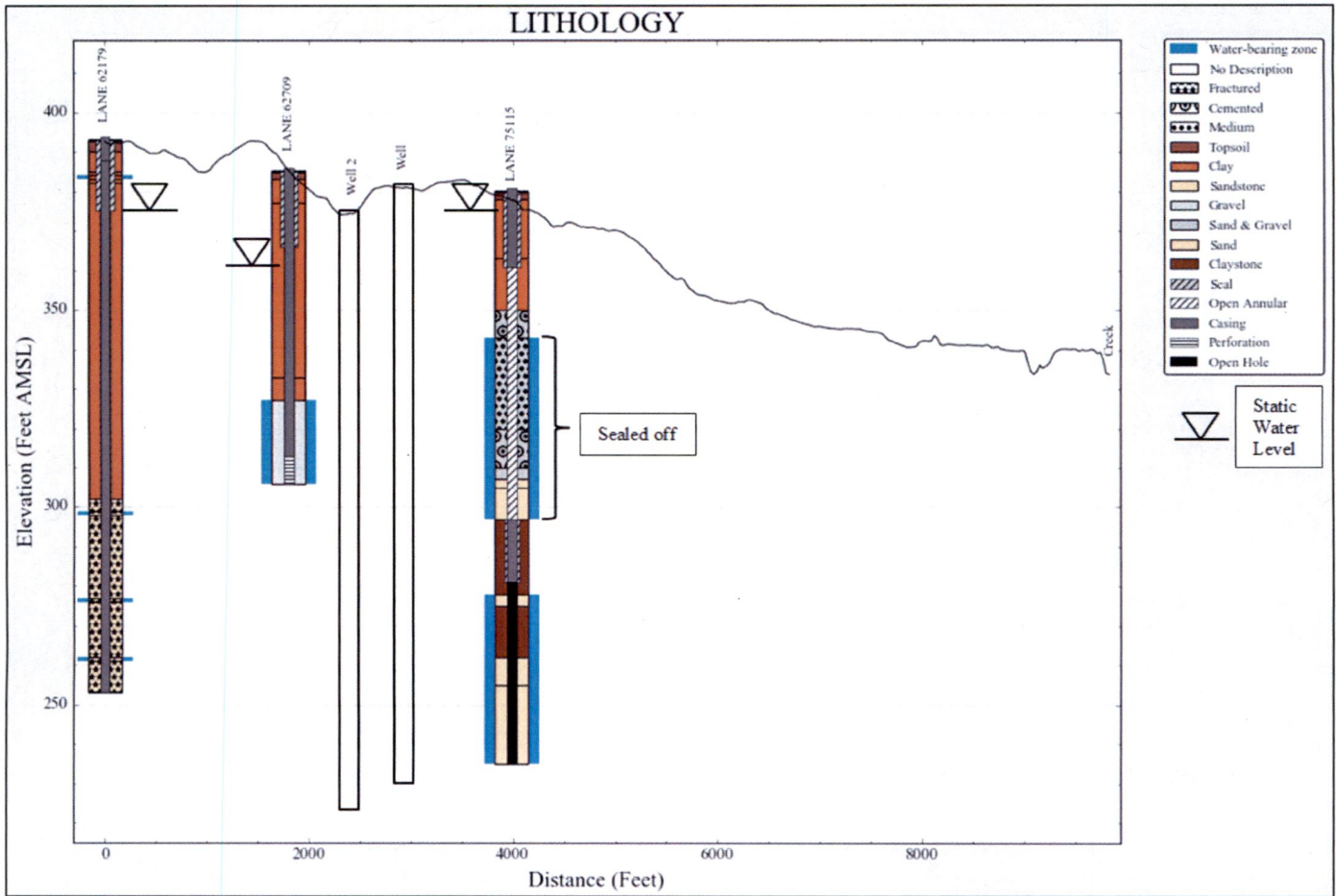
Well Location Map



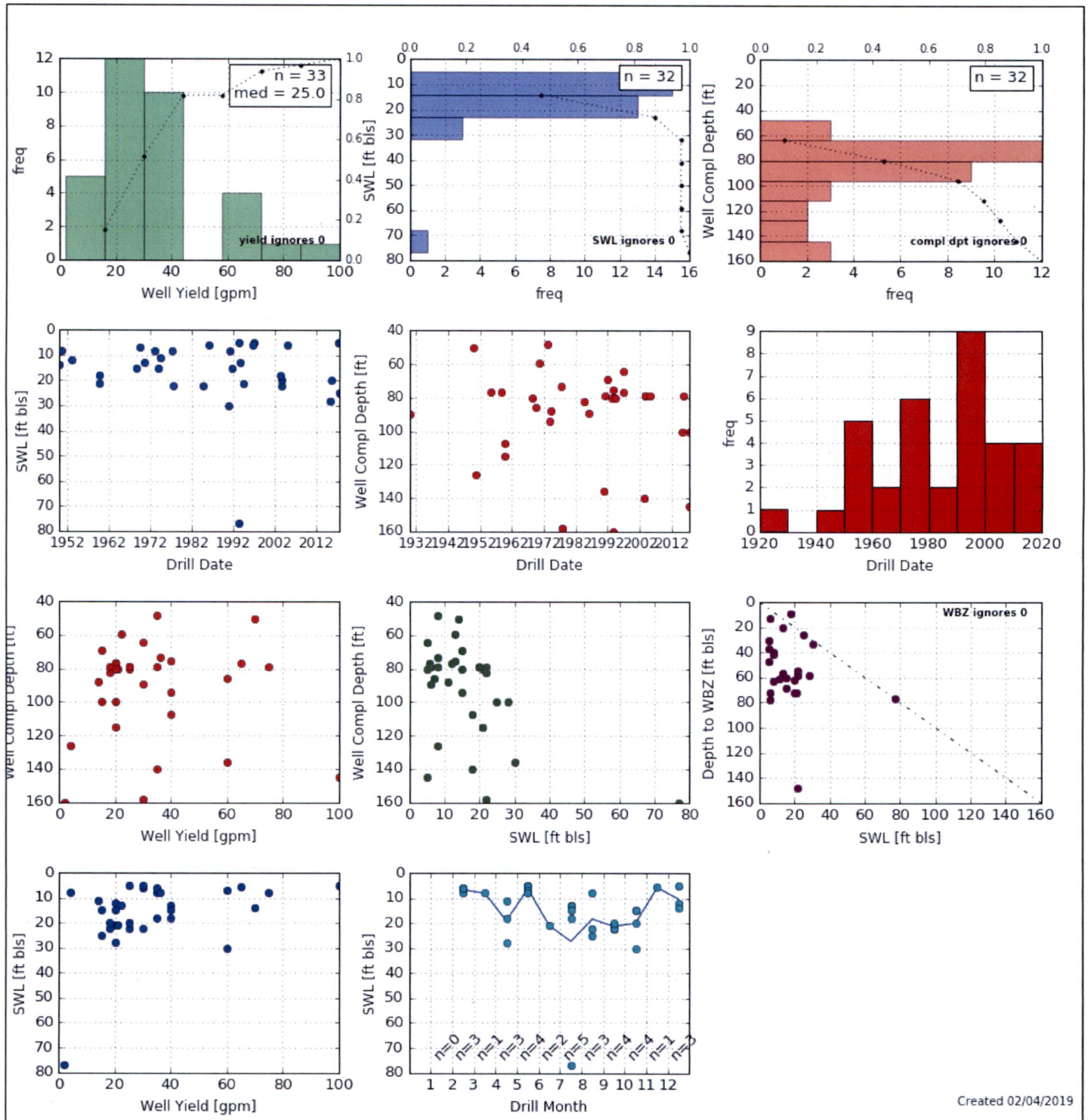
Water-Level Trends in Nearby Wells



Cross Section/Profile

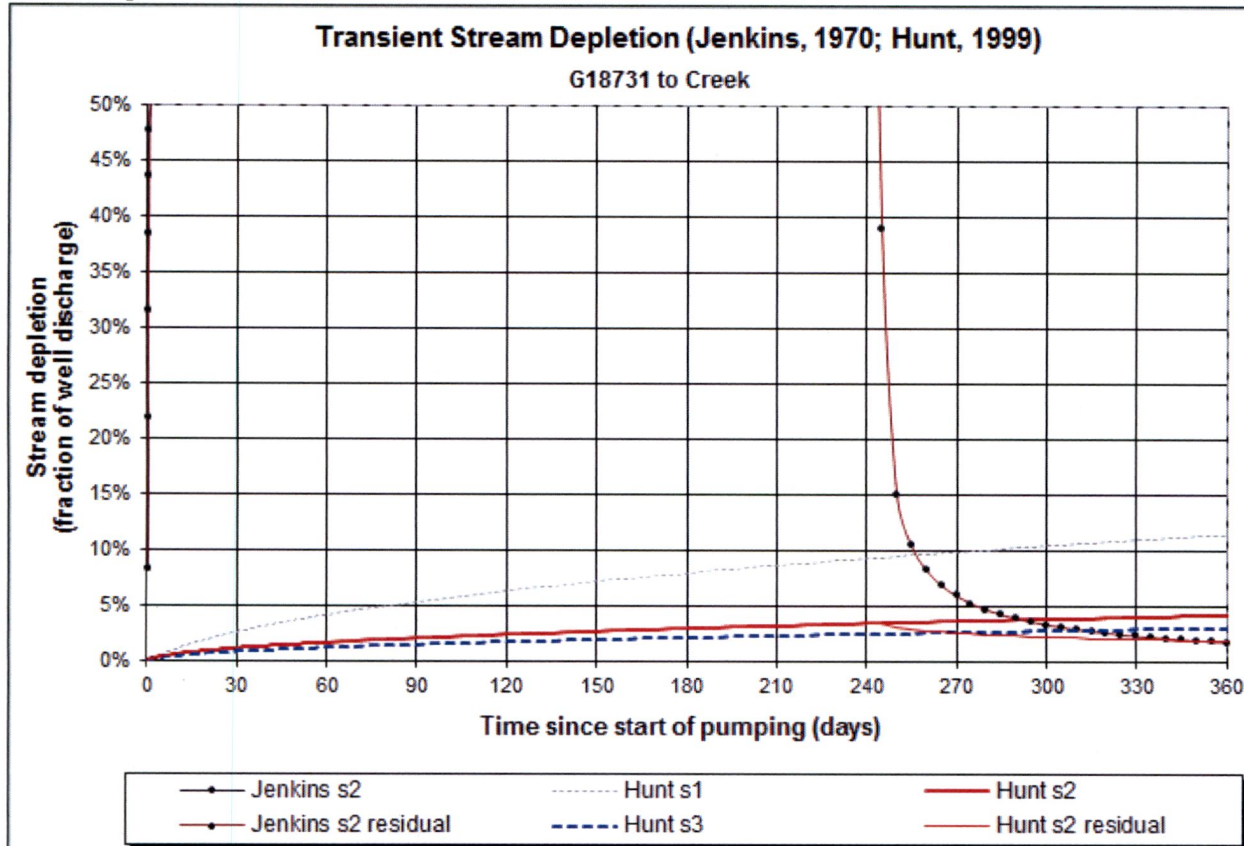


### Well Statistics



Created 02/04/2019

Stream Depletion Model Results



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 244 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Jenk SD s2 %	92.00	94.34	95.38	96.00	96.42	96.73	96.97	97.17	5.92	3.33	2.31	1.76
Jen SD s2 cfs	0.690	0.708	0.715	0.720	0.723	0.725	0.727	0.729	0.044	0.025	0.017	0.013
Hunt SD s2 %	1.13	1.66	2.06	2.40	2.69	2.96	3.20	3.43	2.59	2.24	2.01	1.85
Hunt SD s2 cfs	0.009	0.012	0.015	0.018	0.020	0.022	0.024	0.026	0.019	0.017	0.015	0.014

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.75	0.75	0.75	cfs
Distance to stream	a	2460	2460	2460	ft
Aquifer hydraulic conductivity	K	10	100	200	ft/day
Aquifer thickness	b	100	100	100	ft
Aquifer transmissivity	T	1000	10000	20000	ft <sup>2</sup> /day
Aquifer storage coefficient	S	0.001	0.001	0.001	
Stream width	ws	40	40	40	ft
Streambed hydraulic conductivity	Ks	0.001	0.001	0.001	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	0.013333333	0.013333333	0.013333333	ft/day
Stream depletion factor (Jenkins)	sdf	6.0516	0.60516	0.30258	days
Streambed factor (Hunt)	sbf	0.0328	0.00328	0.00164	