

WATER RESOURCES DEPARTMENT

MEMO

July 25, 2016

TO: Application G- 18219

FROM: GW: Aurora Bouchier
(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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date July 25, 2016

FROM: Groundwater Section Aurora C Bouchier
Reviewer's Name

SUBJECT: Application G- 18219 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: Andrew Robbins County: Clackamas

A1. Applicant(s) seek(s) 0.014 cfs from 2 well(s) in the Willamette Basin,
Middle Willamette subbasin

A2. Proposed use Nursery (0.55 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	CLAC 64407	1	Alluvium	0.014	3S/1E-36 SE-NE	140' N, 1290' W fr E ¼ cor S 36
2	CLAC 12207/12179/18879	2	Alluvium	0.014	3S/1E-36 SW-NE	160' N, 1350' W fr E ¼ cor S 36
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	252	93	90	12/10/2007	167	0-22	+2-157.2	na	na	15		Air
1	253	96	98	10/14/1993	203	0-35	+1-84	3-203	185-200	48		Air

Use data from application for proposed wells.

A4. **Comments:** The applicant's well 2 has been deepened multiple times. Based on the most recent deepening (CLAC 18879) the well is currently producing from a confined source. Well 1 (CLAC 64407) is also producing from a confined source.

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 wells are constructed in a confined aquifer, so the pertinent basin rules do not apply (OAR 690-502-0240).

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: _____
 Comments: Not applicable

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;
 - 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 applicant's wells are located within the Troutdale Formation which contains mostly fine-grained alluvial sediments that are interbedded with thin beds of sand and gravels from land surface to a depth of approximately 700-800 feet (Gannett and Caldwell, 1998). The Troutdale Formation is considered part of the Willamette confining unit (Conlon et al., 2005). Wells in the area produce from thin sand and gravel beds which are inter-bedded with finer-grained beds of clay and silt. The water-bearing zones are not likely to have extensive lateral continuity. The regional water table resides in the Willamette Silt (where present), generally within 10 feet of land surface. At this location, the elevated topography resulted in no deposition of the Willamette Silt; however the silt unit is present to the north and west and underlies Parrott Creek. Where present, the silt acts as a leaking confining unit in relation to the underlying aquifer. Recharge to the aquifer is primarily through the silt unit. Regional discharge is to the Willamette River which is incised completely through the silt unit into the underlying Willamette aquifer, if present, or the Willamette Confining Unit. Smaller streams are generally entrenched in, but do not fully penetrate, the silt unit. Although these smaller streams are hydraulically connected to the underlying aquifer, the connection is very weak because of the low vertical permeability of the silt that occurs between the streambed and the aquifer. Because the Willamette Confining Unit is confined, pumping impacts will propagate rapidly to aquifer boundaries. The principal boundaries are the Willamette River and the Willamette Silt (diffuse downward seepage over a large area). Smaller streams will be very weak boundaries (diffuse seepage over a small area). Pumping withdrawals will be offset by a decrease in stored water in the aquifer, reduced streamflow in the Willamette River, downward leakage of water from the overlying silt into the aquifer, and reduced streamflow to smaller streams. However, the geometry of the system and the low vertical permeability of the silt unit indicate that most pumping impacts will be to the Willamette River with very little impact to the smaller streams.

Within the section, the well logs for the 70 well with reported water levels indicate a falling head with depth. There is some indication that a shallow water-bearing zone (located approximately 100 feet deep in both the applicant's wells) has been

declining locally (mainly evidenced by multiple well deepenings – in particular the applicant's well 2 - CLAC 12207/12179/18879). The hydrograph for nearby CLAC 12211 shows no progressive long-term declines in the deeper water-bearing zone. The water level elevation of the deeper water-bearing zone is approximately 130-150 feet above sea level (als) in CLAC 12211 and approximately 155-160 feet als at the location of the applicant's wells (CLAC 64407 and CLAC 12207/12179/18879) (see hydrograph below). CLAC 12211 is located approximately 4,680 feet to the southwest of the applicant's wells. Seasonal fluctuations are in the order of 10 to 25 feet. As seasonal fluctuations increase due to increased use, hydraulic interference, primarily during the irrigation season, will become more pronounced over time. This indicates a need for water-level monitoring to assess the on-going health of the ground-water system.

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	Alluvial	☒	☐
2	Alluvial	☒	☐

Basis for aquifer confinement evaluation: The well logs for the CLAC 64407 (applicant's Well 1), CLAC 12207/12179/18879 (applicant's Well 2) and nearby wells list a thick sequence of silt and clay above the water bearing zones, and the groundwater rose approximately 70-90 feet above the water bearing zone, 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	Trib with Skyline Res.	162	162	1,340	☒	☐	☐	☐	☒
2	1	Trib with Skyline Res.	155	155	1,530	☒	☐	☐	☐	☒
1	2	Unnamed Trib	162	116-175	~1,950	☒	☐	☐	☐	☒
2	2	Unnamed Trib	155	116-175	~1,950	☒	☐	☐	☐	☒
1	3	Intermittent trib to west	162	162	~2,340	☒	☐	☐	☐	☒
2	3	Intermittent trib to west	155	155	~2,440	☒	☐	☐	☐	☒
1	4	Parrott Creek	162	116-135	~4,050	☒	☐	☐	☐	☒
2	4	Parrott Creek	155	116-135	~4,050	☒	☐	☐	☐	☒
1	5	Willamette River	162	53	~11,500	☒	☐	☐	☐	☒
2	5	Willamette River	155	53	~11,500	☒	☐	☐	☐	☒
1	6	Molalla River	162	125	~13,400	☒	☐	☐	☐	☒
2	6	Molalla River	155	125	~13,400	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: The unnamed tributary which contains Skyline Reservoirs, mapped as intermittent, ranges in elevation from approximately 145 to 200 feet within a mile of the applicant's wells. The unnamed tributary located west of the wells, also mapped as intermittent, ranges in elevation from approximately 116 to 200 feet within a mile of the applicant's well. Although these two tributaries have reaches which are closer to the wells, the hydraulic connection points (the points where the stream elevations are equal to the groundwater elevation – based on the well logs) are located greater than 1/4-mile from the wells, and are the distances listed above.

Water Availability Basin the well(s) are located within: 181: Willamette R > Columbia R - at mouth, it is possible that some pumping affects may be seen in WAB 135: Molalla R > Willamette R – ab Gribble Cr, but it is likely that the vast majority of the affect will be in WAB 181.

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	☐	☐	na		☐	na	☐	See below	☐
2	1	☐	☐	na		☐	na	☐	See below	☐
1	2	☐	☐	na		☐	na	☐	See below	☐
2	2	☐	☐	na		☐	na	☐	See below	☐

1	3	☐	☐	na		☐	na	☐	See below	☐
2	3	☐	☐	na		☐	na	☐	See below	☐
1	4	☐	☐	na		☐	65.10	☐	See below	☐
2	4	☐	☐	na		☐	65.10	☐	See below	☐

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: Due to uncertainties regarding the distribution and occurrence of productive water-bearing zones, a model was not used to estimate the interference at 30 days. However, the fine-grained nature of the material encountered at the wells, and the presence of fine-grained Willamette Silt underlying Parrott Creek, impacts to the streams will likely be minimal.

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:

**** Given the large flows available in the Molalla and Willamette Rivers, and the small rate of appropriation applied for, this analytical modeling was not conducted to assess the interference. The Molalla River has an instream right of 60 cfs and an 80% of natural flow of 65.1 cfs. The Willamette has an instream of 1500 cfs and an 80% of natural flow of 4890 cfs. Water is available for new appropriation on this section of the Willamette River.**

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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. SW / GW Remarks and Conditions:

The Willamette River is the regional groundwater discharge location. The river has incised completely through the Willamette Silt unit in this area onto the underlying Willamette Aquifer. Aquifer material at the site of the two proposed wells consists of alluvium of the Willamette Confining unit, much of which is fine-grained. Groundwater use from this aquifer at the proposed location will impact flows in the Willamette River. This impact likely will be minimized in the closest location of the river by the presence of fine-grained material in the aquifer. The thickness of the fine-grained material is unknown. PSI was not found, and water is available for additional appropriation

References Used:

Application file: G-18219, and nearby G-16270.

Conlon, Terrene D., Wozniak, Karl C., Woodcock, Douglas, Herrera, Nora B., Fisher, Bruce J., Morgan, David S., Lee, Karl K., and Hinkle, Stephen R., 2005, Ground-Water Hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

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

Woodward, Dennis G., Gannett, Marshall W., and Vaccaro, John J., 1998, Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B.

OWRD Groundwater Database and well logs.

D. WELL CONSTRUCTION, OAR 690-200

- D1. Well #: 2 Logid: CLAC 12207/12179/18879
- D2. **THE WELL does not appear to meet current well construction standards based upon:**
- ☒ review of the well log;
 - ☐ field inspection by _____;
 - ☐ report of CWRE _____;
 - ☐ other: (specify) _____
- D3. **THE WELL construction deficiency or other comment is described as follows:** _____
 Puddled clay is not an approved seal material.
- The log for the second deepening (CLAC 18879) lists Sandstone for the material at the water-bearing zone from 194-201 feet bls – based on the log description of the material the well needs to be continuously cased and continuously sealed to 175 feet bls (5-feet into the clay layer listed from 170-179 feet bls).
- 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						
Watershed ID #: 181		WILLAMETTE R > COLUMBIA R - AT MOUTH			Exceedance Level: 80	
Time: 11:34 AM		Basin: WILLAMETTE			Date: 07/22/2016	
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	27,500.00	2,750.00	24,700.00	0.00	1,500.00	23,200.00
FEB	30,000.00	8,020.00	22,000.00	0.00	1,500.00	20,500.00
MAR	28,500.00	7,580.00	20,900.00	0.00	1,500.00	19,400.00
APR	25,400.00	7,190.00	18,200.00	0.00	1,500.00	16,700.00
MAY	20,700.00	4,440.00	16,300.00	0.00	1,500.00	14,800.00
JUN	11,000.00	2,410.00	8,590.00	0.00	1,500.00	7,090.00
JUL	6,280.00	2,360.00	3,920.00	0.00	1,500.00	2,420.00
AUG	4,890.00	2,110.00	2,780.00	0.00	1,500.00	1,280.00
SEP	4,930.00	1,750.00	3,180.00	0.00	1,500.00	1,680.00
OCT	5,990.00	723.00	5,270.00	0.00	1,500.00	3,770.00
NOV	12,700.00	1,010.00	11,700.00	0.00	1,500.00	10,200.00
DEC	24,800.00	1,400.00	23,400.00	0.00	1,500.00	21,900.00
ANN	19,700,000	2,500,000	17,200,000	0	1,090,000	16,100,000

DETAILED REPORT OF INSTREAM REQUIREMENTS													
Watershed ID #: 181		WILLAMETTE R > COLUMBIA R - AT MOUTH										Basin: WILLAMETTE	
Time: 11:13 AM												Date: 07/25/2016	
Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly values are in cfs.													
MF181A	APPLICATION	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0
	MAXIMUM	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0	1500.0

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Watershed ID #: 135
Time: 11:35 AM

MOLALLA R > WILLAMETTE R - AB GRIBBLE CR
Basin: WILLAMETTE

Exceedance Level: 80
Date: 07/22/2016

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	694.00	3.61	690.00	0.00	60.00	630.00
FEB	701.00	3.49	698.00	0.00	60.00	638.00
MAR	714.00	3.19	711.00	0.00	60.00	651.00
APR	685.00	3.70	681.00	0.00	60.00	621.00
MAY	495.00	10.10	485.00	0.00	60.00	425.00
JUN	221.00	14.40	207.00	0.00	60.00	147.00
JUL	97.60	24.70	72.90	0.00	60.00	12.90
AUG	67.00	20.20	46.80	0.00	60.00	-13.20
SEP	65.10	8.80	56.30	0.00	60.00	-3.70
OCT	103.00	3.31	99.70	0.00	60.00	39.70
NOV	306.00	3.15	303.00	0.00	60.00	243.00
DEC	669.00	3.73	665.00	0.00	60.00	605.00
ANN	560,000	6,220	554,000	0	43,500	511,000

DETAILED REPORT OF INSTREAM REQUIREMENTS

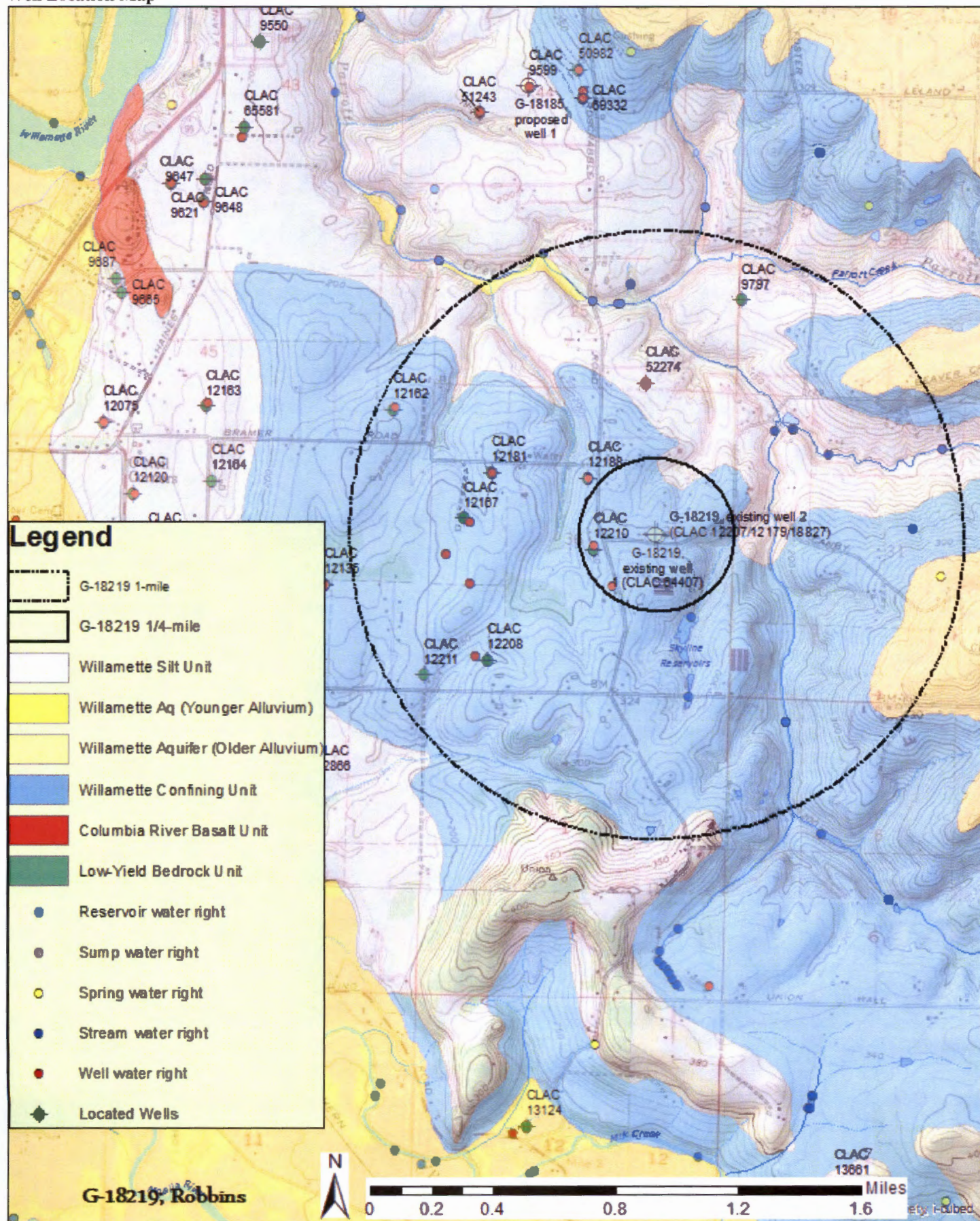
Watershed ID #: 135
Time: 11:13 AM

MOLALLA R > WILLAMETTE R - AB GRIBBLE CR

Basin: WILLAMETTE
Date: 07/25/2016

Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly values are in cfs.													
MF135A	CERTIFICATE	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.00	60.0
	MAXIMUM	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0

Well Location Map



Water-Level Trends in Nearby Wells

