

Groundwater Application Review Summary Form

Application # G- 18518

GW Reviewer Phil Marcy Date Review Completed: 12/5/2017

Summary of GW Availability and Injury Review:

Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

MEMO

ok
KJ

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18518
Date: September 19, 2018

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

Applicant's Well #1 (CLAC 72323): 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.

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

SKYLES DRILLING, INC.

WELL ID # L 121462

START CARD # W212781

Instructions for completing this report are on the last page of this form

503-656-2683

CLAC 72323

(1) OWNER: Well Number: 02
Name Polehn Heights Water Association, Inc
Address PO Box 1434
City Oregon City State OR Zip 97045

(9) LOCATION OF WELL by legal description:
County Clackamas Latitude _____ Longitude _____
Township 3SOUTH N or S. Range 3EAST E or W. of WM.
Section 21A NE 1/4 NE 1/4
Tax lot 02600 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) Nearest 21185 S
Richard Ct, Oregon City, OR

(2) TYPE OF WORK:
 New Well Deepening Alteration (repair/recondition) Abandonment

(10) STATIC WATER LEVEL:
235 ft. below land surface. Date 7/15/2016
Artesian pressure _____ lb. per square inch. Date _____

(3) DRILL METHOD: RO SALEM, OR
 Rotary Air Rotary Mud Cable Auger
 Other Holte

(11) WATER BEARING ZONES:
Depth at which water was first found 41'

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other

From	To	Estimated Flow Rate	SWL
41	60	2	41
71	129	100+	57
314	324	36	235

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes No Depth of Completed Well 330 ft.
Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			Amount
Diameter	From	To	Material	From	To	sacks or pounds
10	0	71	Bentonite	71	0	44 Sacks
7.6	71	190	Calculated			32 Sacks
8	190	200	Cement	200	190	10 Sacks
7.6	200	330	Calculated			10 Sacks

How was seal placed: Method A B C D E
 Other Poured bentonite
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(12) WELL LOG: Ground elevation _____

Material	From	To	SWL
Clay, brown	0	3	
Clay, reddish-brown	3	5	
Clay, brown gritty w/layers of clay, reddish-brown soft	5		40
Claystone, gray broken	40	51	
Lava, gray broken	51	58	
Sandstone, gray	58	60	
Clay, tan sandy	60	68	
Clay, gray	68	71	
Sand, multicolored cemented w/gravels	71		124
Clay, tan sandy w/seams of sand	124	129	
Clay, gray	129	170	
Claystone, dark gray	170	174	
Claystone, gray broken w/seams of sand, mc coarse	174		178
Lava, gray	178	277	
Claystone & clay, gray	277	296	
Clay, dark brown	296	299	
Claystone, gray	299	301	
Sandstone, gray	301	314	
Sand, mc coarse w/gravels	314	324	235
Clay, gray	324	330	

(6) CASING/LINER:
Casing: Diameter 6 From +2 To 329 Gauge .250 Steel Plastic Welded Threaded
Liner: Diameter 4.5 From 190 To 330 Gauge Sch40 Steel Plastic Welded Threaded
Drive Shoe used Inside Outside None
Final location of shoe(s) _____

Date started 7/7/2016 Completed 7/15/2016

(7) PERFORATIONS/SCREENS:
 Perforations Method Saw
 Screens Type _____ Material _____
From 320 To 329 Slot size 1/8x3 Number 58 Diameter _____ Tele/pipe size _____ Casing Liner

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, 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.
Signed _____ WWC Number 1715
Date 7/19/2016
Skyles Drilling, Inc.

(8) WELL TESTS: Minimum testing time is 1 hour
 Pump Bailor Air Flowing Artesian
Yield gal/min 36 Drawdown _____ Drill stem at 326 Time 1 hr.
TDS Amount 14.8 ppm

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, 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.
Signed _____ WWC Number 1592
Date 7/19/2016
Skyles Drilling, Inc.

Temperature of Water 56.6° Depth Artesian Flow found _____
Was a water analysis done? Yes By whom SDI, Iron 1ppm
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other Too Much Iron
Depth of strata: 41' - 60' & 71' - 129'

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/04/2017
 FROM: Groundwater Section Phillip I Marcy
 Reviewer's Name
 SUBJECT: Application G- 18518 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: Polehn Heights Water Association Inc. County: Clackamas

A1. Applicant(s) seek(s) 0.13 cfs from 1 well(s) in the Willamette Basin,
Clackamas River subbasin

A2. Proposed use Group Domestic 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 72323	1	Alluvium	0.13	3S/3E-21 NE-NE	1160'S, 470'W fr NE cor S 21

* 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	675	41	235	07/15/2016	330	0-71	0-320	190-330	320-329	36	-	Air

Use data from application for proposed wells.

A4. **Comments:** Proposed POA well produces from sand and gravel beneath ~100' of volcanic rock (Boring Volcanics). Head elevation is significantly lower in productive zone than that of upper alluvial aquifers as reported on log.

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;
 - 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 area in the vicinity of the proposed POA well is underlain by basalt flows of the Boring Lavas and sediments of the Troutdale Formation and the Sandy River Mudstone (Trimble, 1963). In the area of the applicant’s well, basalt flows of the Boring Lavas occur at land surface (Trimble, 1963). The basalt flows are generally up to 200 feet thick in the area, except in areas near the eruption vents, where the basalts extend to much greater depths. A few wells in the area report Boring Lavas to depths of about 550 feet (see logs for CLAC 61545 and CLAC 61546). Beneath the Boring lava lies several hundred feet of older alluvium, which is generally fine-grained mudstone containing beds of sand and gravel. The proposed POA (CLAC 72323) produces from a sand and gravel aquifer beneath a significant thickness of Boring Volcanics. Similar lithology is reported on nearby log CLAC 64823, which is located roughly 0.8 miles to the NW of the proposed POA location and also constructed to produce from water-bearing gravels beneath greater than 100’ of basalt. These wells report similar water level elevations, which are fairly stable in CLAC 64823, fluctuating roughly 10 feet since 2008 (see attached hydrograph).

Nearby groundwater rights within one quarter mile develop from shallower parts of the aquifer system, for which reported well log and water level reporting data show drastically higher head elevations. The driller’s log for the POA well indicates two shallower water-bearing zones with similar head elevations (630’ and 614’ AMSL), nearly 200’ higher than that of the production zone (440’ AMSL). Little to no additional interference is expected at these nearby rights as a result of pumping at the proposed POA location.

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 beneath Boring Volcanics	<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"/>

Basis for aquifer confinement evaluation: Based upon the relationship between the head elevation and the elevation of the water-bearing zone utilized by the proposed POA well, there is some degree of confinement within the deep-seated sand and gravel aquifer. Groundwater in this area is locally confined beneath thick beds of saturated clay (mapped as Sandy River Mudstone) that overlie and are interbedded with coarser-grained productive zones. However, the productive zone within the well occurs at an elevation coincident with the elevation of nearby stream basins, and discharge from this zone is likely a source of water maintaining seasonal flows in these streams (see attached map).

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	Little Clear Creek	440	385-325	2700	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Clear Creek	440	345-325	4100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	3	Unnamed trib to Abernathy Creek	440	600-425	2650	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	4	Bargfeld Creek	440	600-490*	3375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The elevations of nearby streams are coincident with, or below the elevation of groundwater within CLAC 72323, and there is no evidence of a significant barrier to horizontal groundwater flow. Therefore, incision by local stream valleys facilitates discharge of groundwater from the productive aquifer materials encountered within the proposed POA well as these lithologies are exposed at land surface in the steep-sided valley walls.

Water Availability Basin the well(s) are located within: Willamette R > Columbia R – At Mouth (ID # 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	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	4890	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	4890	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
1	3	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	4890	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
1	4	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	4890	<input type="checkbox"/>	<<25%	<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?
			<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"/>

Comments: This section does not apply.

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													
(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: The POA well will produce water from sediments that lie beneath the elevation of surface water sources within one mile. Due to the intervening low-permeability beds that likely lie between the streambed and the productive zones in the well, hydraulic connection to surface waters are likely inefficient and diffuse, and are expected to be well below 25% after 30 days of pumping.

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:** _____

References Used:

Trimble, Donald E., 1963, Geology of Portland, Oregon and Adjacent Areas, Geological Survey Bulletin 1119, 119 p., 1 pl.

McFarland, William D., and Morgan, David S., 1996, Description of the Groundwater Flow System in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-A, 58p, 7 plates.

Swanson, R.D., McFarland, W.D., Gonthier, J.B., and Wilkinson, J.M, 1993, A Description of Hydrogeologic Units in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Resources Investigations Report 90-4196, 56 p., 10 sheets, scale 1:100,000.

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, 32p, 8 plates.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

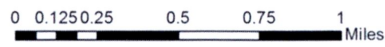
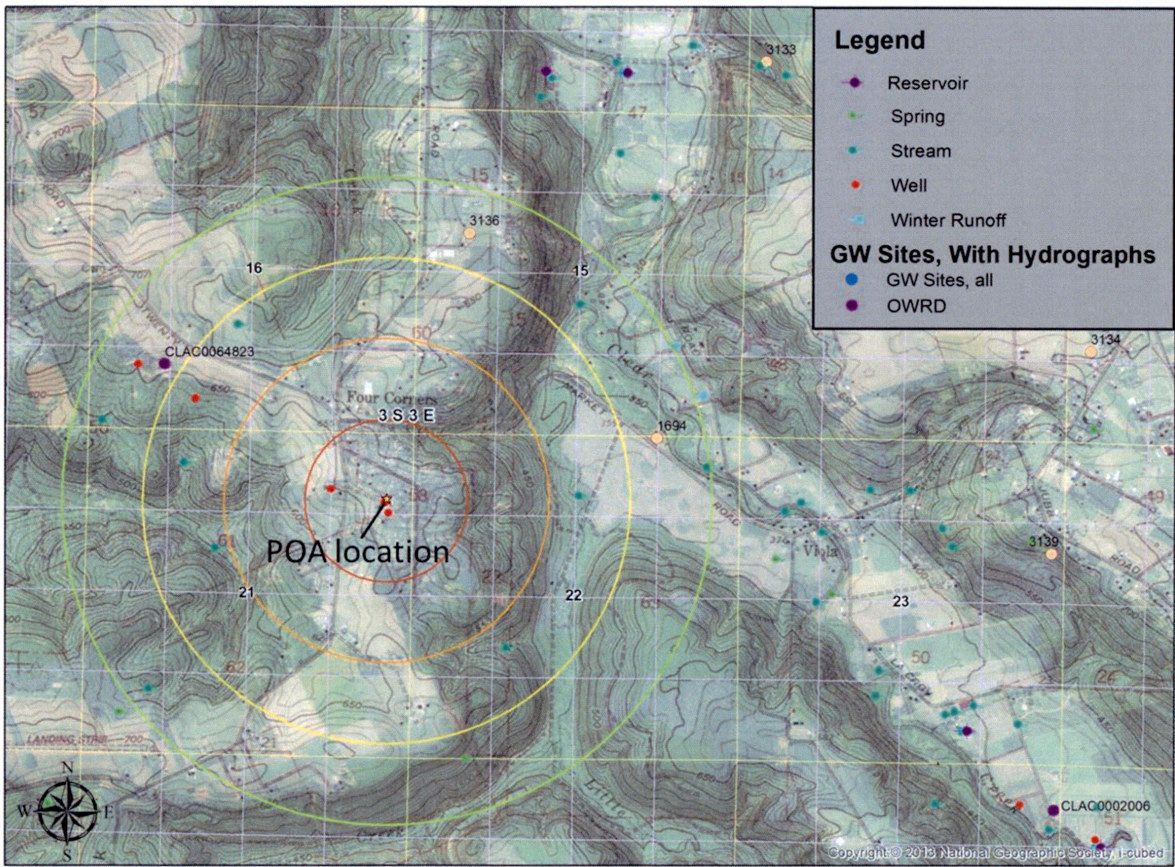
- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

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.

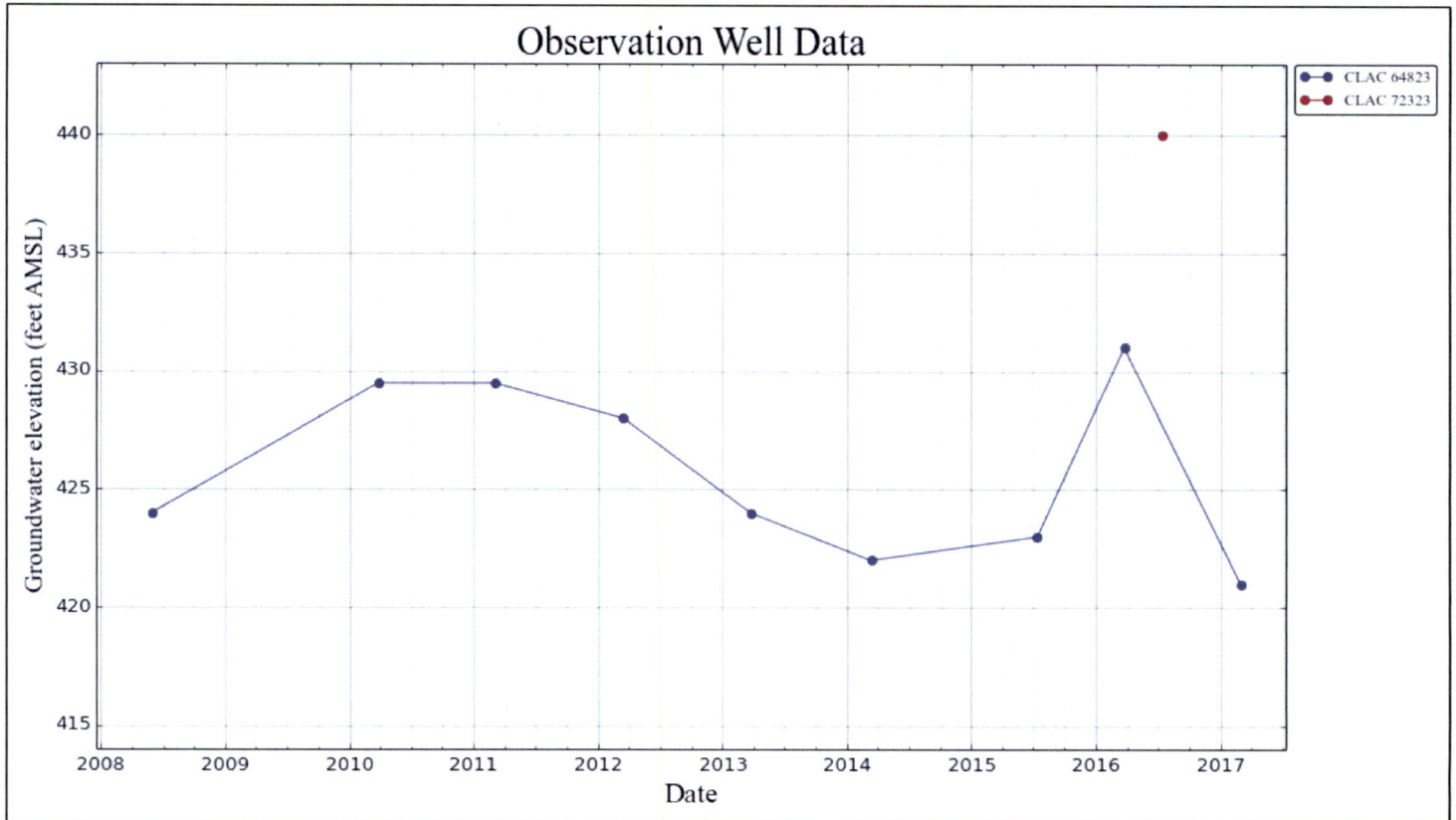
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 181		WILLAMETTE R > COLUMBIA R - AT MOUTH			Exceedance Level: 80	
Time: 10:52 AM		Basin: WILLAMETTE			Date: 12/05/2017	
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	2,740.00	24,800.00	0.00	1,500.00	23,300.00
FEB	30,000.00	8,010.00	22,000.00	0.00	1,500.00	20,500.00
MAR	28,500.00	7,570.00	20,900.00	0.00	1,500.00	19,400.00
APR	25,400.00	7,170.00	18,200.00	0.00	1,500.00	16,700.00
MAY	20,700.00	4,430.00	16,300.00	0.00	1,500.00	14,800.00
JUN	11,000.00	2,340.00	8,660.00	0.00	1,500.00	7,160.00
JUL	6,280.00	2,290.00	3,990.00	0.00	1,500.00	2,490.00
AUG	4,890.00	2,040.00	2,850.00	0.00	1,500.00	1,350.00
SEP	4,930.00	1,670.00	3,260.00	0.00	1,500.00	1,760.00
OCT	5,990.00	709.00	5,280.00	0.00	1,500.00	3,780.00
NOV	12,700.00	1,000.00	11,700.00	0.00	1,500.00	10,200.00
DEC	24,800.00	1,390.00	23,400.00	0.00	1,500.00	21,900.00
ANN	19,700,000	2,480,000	17,300,000	0	1,090,000	16,200,000



1:24,000

Water-Level Trends in Nearby Wells



Nearby CLAC 64823 (0.8 miles away) displays reasonably stable water levels during the past decade. Groundwater elevation is nearly coincident with that reported in POA well CLAC 72323.