

Groundwater Application Review Summary Form

Application # G- 19045 re-review

GW Reviewer Travis Brown Date Review Completed: 3/11/2024

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).

WATER RESOURCES DEPARTMENT

MEMO

3/11/2024

TO: Application G- 19045 re-review

FROM: GW: Travis Brown
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES The source of appropriation is hydraulically connected to a State Scenic
☒ NO Waterway or its tributaries

☐ YES
☒ NO Use the Scenic Waterway Condition (Condition 7J)

☐ 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 [Enter] 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 3/11/2024
 FROM: Groundwater Section Travis Brown
 Reviewer's Name
 SUBJECT: Application G- 19045 re-review Supersedes review of 2/1/2022
 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: John & Cynthia Walker, Jeffrey & Jackye Doyle County: Clackamas

A1. Applicant(s) seek(s) 0.401 cfs from 2 well(s) in the Willamette Basin,
Molalla River-Pudding River Subbasin subbasin

A2. Proposed use Nursery – containerized (50 ac) Seasonality: Year-round

A3. Well and aquifer data (attach and number logs for existing wells; mark proposed wells as such under logid):

POA 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 56770	Well 1	Alluvium	0.067	5S/2E-22 SW-SW	545' N, 1235' E fr SW cor S22 ^d
2	PROPOSED	Well 2	Alluvium	0.334	5S/2E-22 SW-SW	105' N, 355' E fr SW cor S22 ^d

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	118 ^f	0-30 ^f	0-118.5 ^f		42-78, 95-115 ^f	25 ^f	NA	Air ^f
2	120 ^c	0-30 ^c	0-120 ^c					

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	591 ^e	42 ^f	12.5 ^f	5/2/2001 ^f	10	3/28/2017 (CLAC 10479)
2	583 ^e				10	3/28/2017 (CLAC 10479)

Use data from application for proposed wells.

A4. **Comments:** The requested POA/POU is located approximately 1.7 miles southeast of Molalla, Oregon.

^a The T/R-S, well and POU are located in Clackamas County; on Attachment 2: Land Use Information, the listed county is Marion; this discrepancy appears to be a mistake, and the county of the indicated T/R-S (Clackamas) is used.

^b Applicant indicates on Application Map that the POU is 50 acres, and in Section 3: Well Development that the Annual Volume will be 250 acre-feet (AF). However, applicant also indicates in Land Use Information section that water will be applied to "greenhouses and crops", and "irrigation will be done with drip irrigation system" in Section 6: Water Management. For Nursery-Containerized, the maximum annual duty is 5 acre-feet/acre. For Nursery-In Ground, the maximum annual duty is 2.5 acre-feet/acre. For Irrigation, the maximum annual duty is 2.5 acre-feet/acre. If any of the 50 acres is developed as other than Nursery-Containerized, the lower annual duty of 2.5 acre-feet/acre would apply.

^c Proposed well construction from applicant for Well 2.

^d There appears to be a discrepancy in the Public Lands Survey System (PLSS) projection used in the application map and that used by Department. The "metes-and-bounds" location description provided in the application for POAs 1 and 2 are 70 feet and 40 feet northwest of the mapped locations, respectively. The mapped locations are used for this review.

^e Well head elevation estimated based on LIDAR measurements at proposed/existing well locations (Watershed Sciences, 2009).

^f Values from Water Well Report for CLAC 56770.

- A5. ☐ **Provisions of the** OAR 690-502 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 requested POAs produce groundwater from a confined aquifer, therefore, per OAR 690-502-0240, the relevant Willamette Basin Rules (OAR 690-502-0120) do not apply.
- A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: NA
 Comments: NA

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:
- ☐ **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;
 - ☐ **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;
 - ☐ **will not** or ☐ **will** likely to be available within the capacity of the groundwater resource; or
 - ☒ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
 - ☒ The permit should contain condition #(s) 7RLA (annual water level), Large Water Use;
 - ☒ The permit should be conditioned as indicated in item 2 below.
 - ☐ The permit should contain special condition(s) as indicated in item 3 below;
- B2.
 - ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
 - ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
 - ☒ **Condition** to allow groundwater production only from the Troutdale Formation groundwater reservoir ~~between approximately~~ _____ ft. and _____ ft. below land surface;
 - ☐ **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 POA/POU is in the Troutdale Formation, a late-tertiary deposit of fluvial and lacustrine origin, composed primarily of conglomerate and tuffaceous sandstone (Trimble 1963, Hampton 1972). Where hardened, the cement of Troutdale Formation layers is composed of somewhat permeable clay minerals (Trimble 1963). Inferring from the mapped thickness of adjacent sections, the Troutdale Formation is likely to be up to 100 ft thick in 5S/2E-22 (Hampton 1972).

Given the thickness of the water-bearing layers and the underlying blue claystone typical of the Willamette Confining Unit (153 to 157 ft bls [434 to 438 ft msl]) recorded in the POA Well Report (CLAC 56770), it is likely that the two water-bearing zones are layers of sandstone within the Willamette aquifer (Gannett & Caldwell 1998, Conlon et al 2005, Swanson et al 1993). There is a wide variability in hydraulic characteristics of the Willamette aquifer, owing to the variety of compositions and degree of consolidation (O'Connor et al 2001). Although the POAs are near the mapped southern extent of the Molalla alluvial fan (Woodward et al 1998), the sandstone, claystone and gravel layers are more likely to be consolidated formations from discontinuous braided stream deposits (Gannett & Caldwell 1998). According to the Water Well Report for CLAC 56770 (the requested POA), the applicant's existing well appears to produce water from two layers of water-bearing

sandstone and claystone in the Troutdale sandstone aquifer of the Troutdale Formation (Swanson et al 1993). The first sandstone layer is 35 ft thick from 42 and 77 ft below land surface (bls) (elevations of approximately 514 ft to 549 above mean sea level [msl]); the second layer is gravel, claystone and sandstone, and 34 ft thick from 81 to 115 ft bls (476 to 510 msl). The second POA is proposed to be sealed to 30 ft, cased to 120 ft, and access a water-bearing zone in an alluvial aquifer. It is assumed that this well would utilize a sandstone layer similar to CLAC 56770.

A review of statistics for nearby well records was completed and compared with the proposed rate of 0.401 cfs (180 gpm) for this application (see Well Statistics 5S/2E-22). The median reported well yield is 20 gpm, and the maximum reported yield is 150 gpm. Water level trends for nearby wells that utilize alluvial aquifers appear to be dynamically stable (see Water Level Measurements in Nearby Wells). The groundwater resource is likely not over-appropriated, and the proposed use is likely within the capacity of the groundwater resource.

The nearest groundwater user (CLAC 10479, a POA on permit G17174 with priority date of 5/13/2013) is located approximately 585 ft south of Well 1, and 932 ft southeast of the proposed location for Well 2, and at an elevation of 596 ft. CLAC 10479 is completed to a depth of 125 ft bls with a perforated casing from 50 to 108 ft bls (488 to 546 ft msl). The seal of Well 1 (CLAC 56770) extends to 561 ft msl, but due to the seemingly discontinuous nature of the water-bearing sandstones and claystones, it is difficult to determine whether Well 1 is sealing through the water-bearing zone that CLAC 10479 is utilizing. It is likely the proposed use would cause some degree of well-to-well interference with CLAC 10479; however, due to a lack of high quality data for this area with which to estimate hydraulic properties of the aquifer, it is difficult to anticipate how much the proposed use may interfere with nearby groundwater rights. To assess the degree of interference, the proposed use was analyzed using the Theis (1935) solution for a confined aquifer (see attached Theis Drawdown Analysis-Well 1, and -Well 2). Results indicate that the proposed use is not likely to cause well-to-well interference with CLAC 10479 or similarly located wells that exceeds the threshold under the standard condition for alluvial aquifers in the Willamette Basin.

To protect senior users and the groundwater resource, the conditions in B1.d.i. and B2.c are recommended for any permit issued pursuant to this application. Reference levels for the proposed POA are based on the highest reported water level in nearby neighboring well CLAC 10479, which is constructed similarly to the proposed POA and has a water level reporting and decline limit permit condition per Certificate 96646.

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 aquifer	☒	☐
2	Alluvial aquifer	☒	☐

Basis for aquifer confinement evaluation: Well 1 (CLAC 56770) has a static water level (SWL) reported to be 12.5 feet bls (elevation of 578.5 ft msl). CLAC 56770 reports clay layers from 1 to 34 ft bls (elevation of 557 to 590 ft msl), indicating at least 33 ft of semi-confining layer reaching up to nearly the ground surface (elevation of 590 ft). The SWL is 21.5 above the bottom of the confining layer. CLAC 56770 is continuously sealed from the surface to 30 ft bls (561 ft msl). Well 2, the new well to be constructed, is anticipated to be of similar construction with a continuous seal to 30 ft below land surface.

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	Teasel Creek	578.5-581.5 ^a	460-563 ^b	3,054	☒	☐	☐	☐	☒
1	2	Molalla River	578.5-581.5 ^a	407-434 ^b	3,9391	☒	☐	☐	☐	☒
2	1	Teasel Creek	578.5-581.5 ^a	460-563 ^b	2,219	☒	☐	☐	☐	☒
2	2	Molalla River	578.5-581.5 ^a	407-434 ^b	4,807	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: POA 1 (CLAC 56770) is continuously sealed into a clay-dominated confining layer at an elevation of around 561 ft msl with water-bearing zones at 476 to 510 ft msl and 514 to 549 ft msl, and static water level of 578.5 ft msl. POA 2 would be constructed similarly to POA 1 and would produce from the same water-bearing zones. Groundwater elevations are above the surface water elevation in SW 1 (Teasel Creek) and SW 2 (Molalla River) indicating that the local groundwater is discharging to surface water. All of the surface water drainages have incised to some degree below the elevation of the lowest water-bearing zone (elevation 476 ft msl) from which POA 1 (CLAC 56770) produces. In addition, the Molalla River in this stretch is reported to have incised into the sandstone and conglomerate bedrock with thin alluvial fill (Trimble 1963, Carpenter et al 2012).

Groundwater in the applicable water-bearing zone is presumed to discharge where exposed near land surface.

^a Groundwater elevation calculated from static water level reported in CLAC 56770 and latest static water level reported for CLAC 10479, and well head elevations estimated based on LIDAR measurements at existing well locations (Watershed Sciences, 2009).

^b Surface water elevations were estimated from land surface elevations along stream reaches (Watershed Sciences, 2009; USGS, 2013).

Water Availability Basin the well(s) are located within: SW 1: PUDDING R>MOLALLA R-AB MILL CREEK
SW 2: MOLALLA R>WILLAMETTE R-AB MILK CREEK

- 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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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?	Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☐	☐	NA	NA	☐	67.3	☐	<25%	☐
1	2	☐	☐	IS70747	78.7	☐	54.5	☐	*	☐
2	1	☐	☐	NA	NA	☐	67.3	☐	<25%	☐
2	2	☐	☐	IS70747	78.7	☐	54.5	☐	*	☐

- 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 #		Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐

Comments: Potential depletion of (interference with) SW 1 (Teasel Creek) was estimated using the Hunt (2003) analytical model. Hydraulic parameters used for the model were derived from regional data or studies of the hydrogeologic regime (OWRD Well Log Query Report; 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). See attached “Stream Depletion Analysis – SW 1” for the specific parameters used in the analysis. The Hunt 2003 analytical model results indicate that depletion of (interference with) SW 1 due to pumping of the proposed POA is anticipated to be much less than 25 percent of the well discharge at 30 days of continuous pumping.

Because only the distance is expected to vary between the POA and surface water sources, only the POA-SW pair with the shortest distance (in this case, POA 2 and SW 1) was analyzed quantitatively for interference (stream depletion). All other POA-SW pairs would presumably result in less interference due to their greater separation relative to POA 2 and SW 1. Therefore, the interference of both proposed POA with all surface water sources within 1 mile is anticipated to result in much less than 25 percent of the well discharge at 30 days of continuous pumping.

* Interference at 30 days could not be estimated for the Molalla River because the hydrogeologic setting (aquifer is confined at the well but not the stream and free-flowing seeps as noted in Carpenter et al 2012) does not sufficiently meet model assumptions of the available techniques for determining stream depletion (e.g. Hunt 2003 and similar).

- 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													

(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: NA

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:** None

References Used: Application file: G-19045

Pumping Test Files: CLAC 2060, CLAC 14273, CLAC 17200, CLAC 17723, CLAC 18102, CLAC 53757, CLAC 45478, CLAC 60360, CLAC 64005, CLAC 66134

Well Reports: CLAC 56770, CLAC 10479, CLAC 10404, CLAC 10233, CLAC 10241

Carpenter, K.D., Czuba, C.R., Magirl, C.S., Marineau, M.D., Sobieszyk, S., Czuba, J.A., and Keith, M.K., 2012, Geomorphic setting, aquatic habitat, and water-quality conditions of the Molalla River, Oregon, 2009–10: U.S. Geological Survey Scientific Investigations Report 2012–5017, 78 p

Conlon, T.D., Lee, K.K., and Risley, J.R., 2003, Heat tracing in streams in the central Willamette Basin, Oregon, in Stonestrom, D.A. and Constantz, Jim, eds., Heat as a tool for studying the movement of groundwater near streams: U.S. Geological Survey Circular 1260, chapter 5, p. 29-34.

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.

Domenico, P.A. and Mifflin, 1965, Water from low-permeability sediments and land subsidence: Water Resource Research, v. 1, no. 4, p. 563-576.

Freeze, R.A. and Cherry, J.A., 1979, Groundwater, Prentice Hall, Englewood Cliffs, New Jersey, 604 p.

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.

Hampton, E.R. 1972. Geology and Ground Water of the Molalla-Salem Slope Area, Northern Willamette Valley, Oregon. USGS Water Supply Paper 1997.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

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

O'Connor, J.E., Sarna-Wojcick, A., Wozniak, K.C., Polette, D.J., Fleck, R.J., 2001, Origin, Extent, and Thickness of Quaternary Geologic Units in the Willamette Valley, Oregon; U.S. Geological Survey, Professional Paper 1620, 51 p.

Swanson, R.D., McFarland, W.D., Gonthier, J.B., 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, 62 p

Trimble, D.E., 1963, Geology of Portland, Oregon, and adjacent areas: U.S. Geological Survey Bulletin 1119, 119 p.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

United States Geological Survey, 2014, *Wilhoit quadrangle*, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

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, 82 p.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon, Portland, OR, December 21.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

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

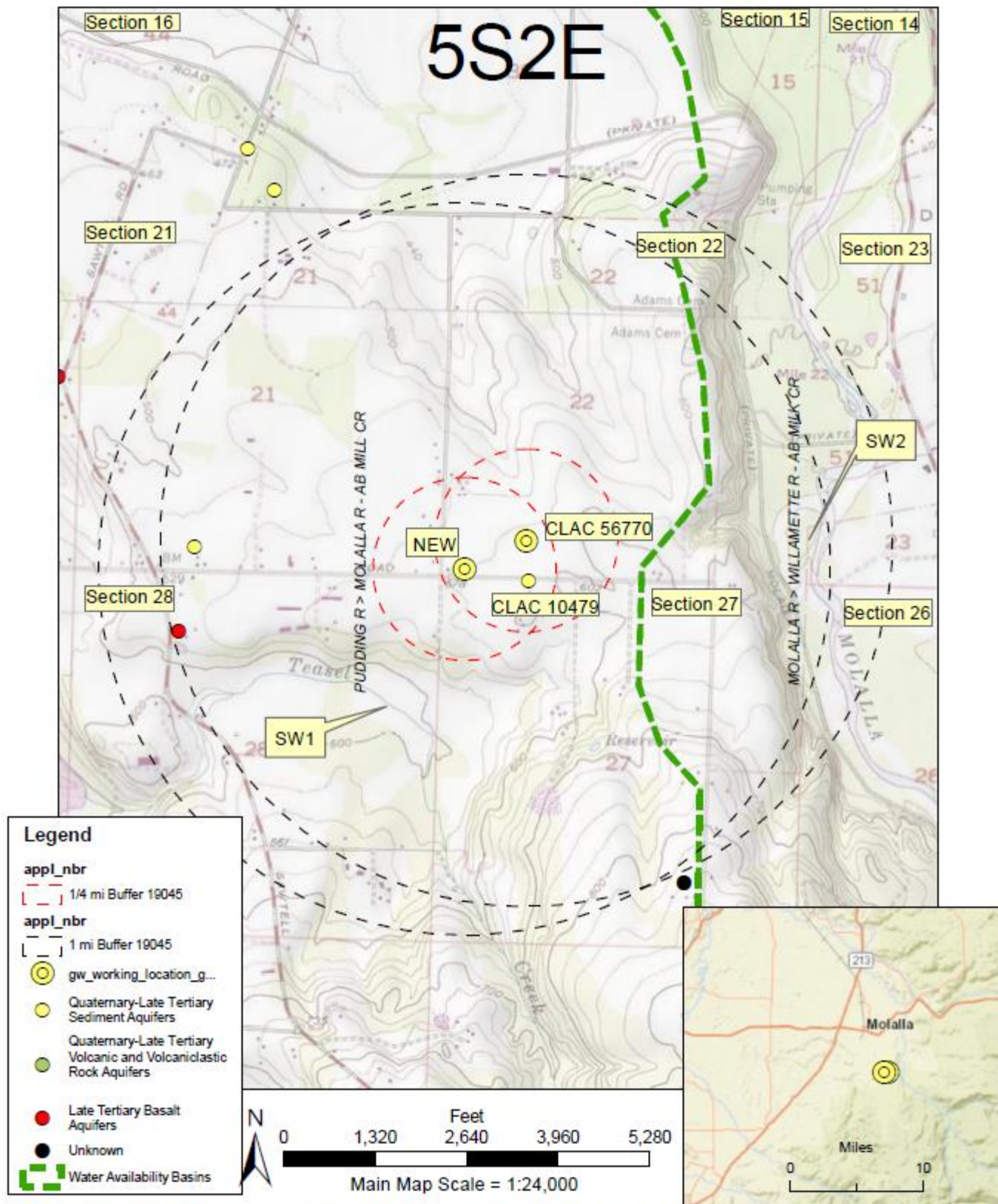
- a. ☐ review of the well log;
- b. ☐ field inspection by _____;
- c. ☐ report of CWRE _____;
- d. ☐ other: (specify) _____

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.**

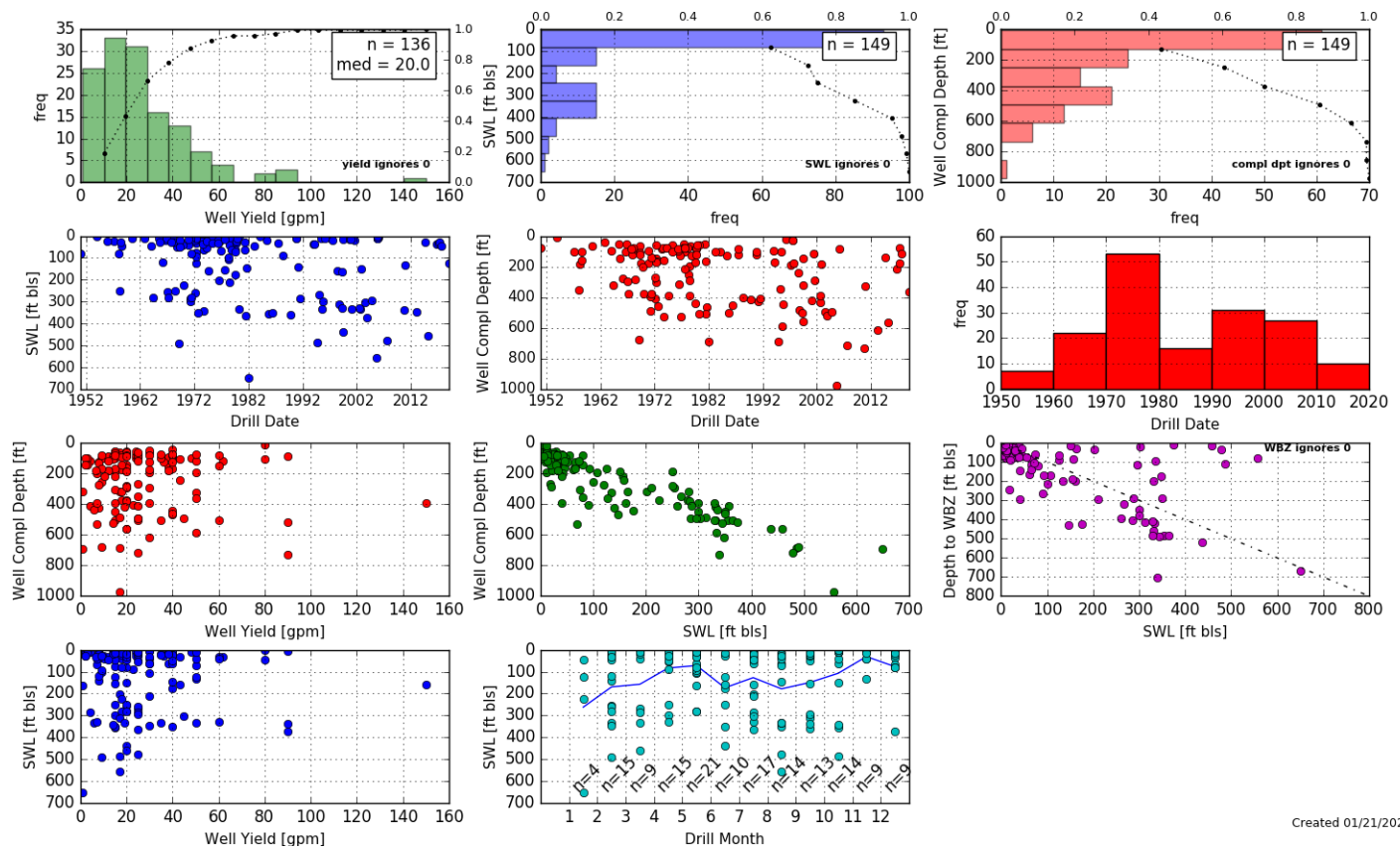
Well Location Map

G19045 Walker-Doyle

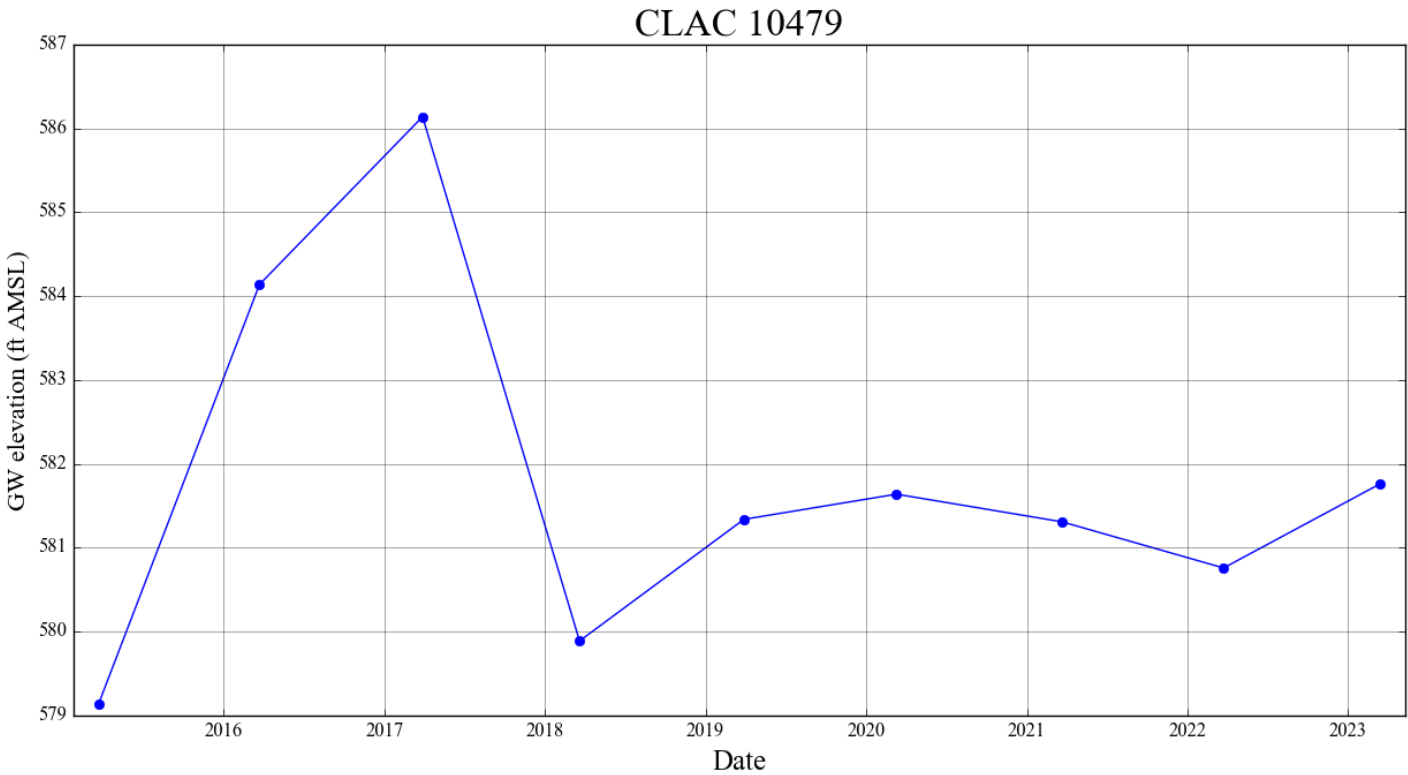
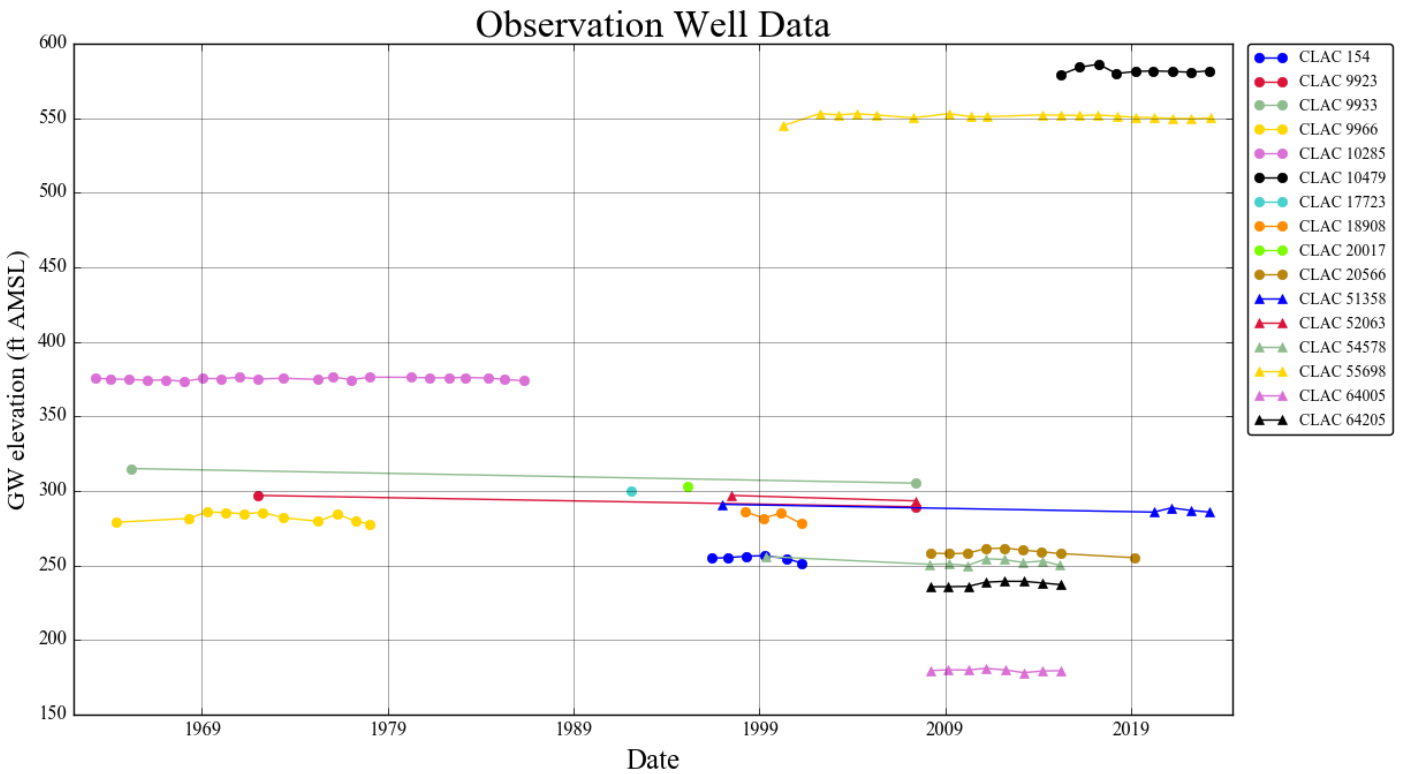


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGOC, (c) OpenStreetMap contributors, and the GIS User Community
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Wells Statistics

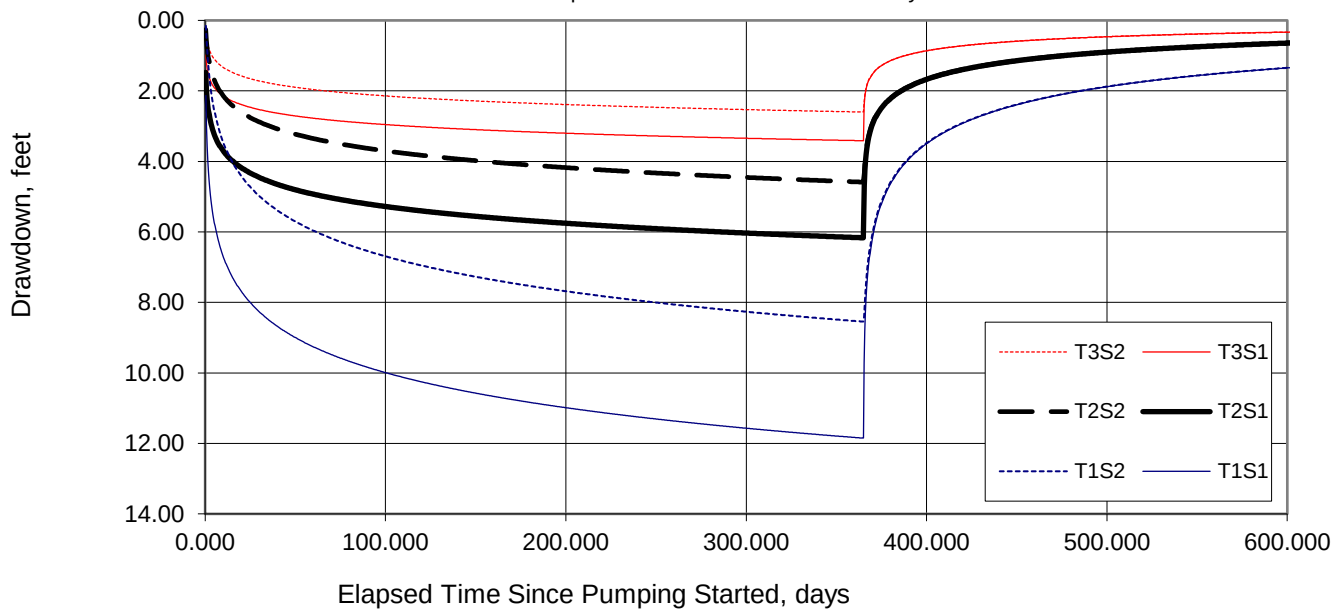


Water-Level Measurements in Nearby Wells

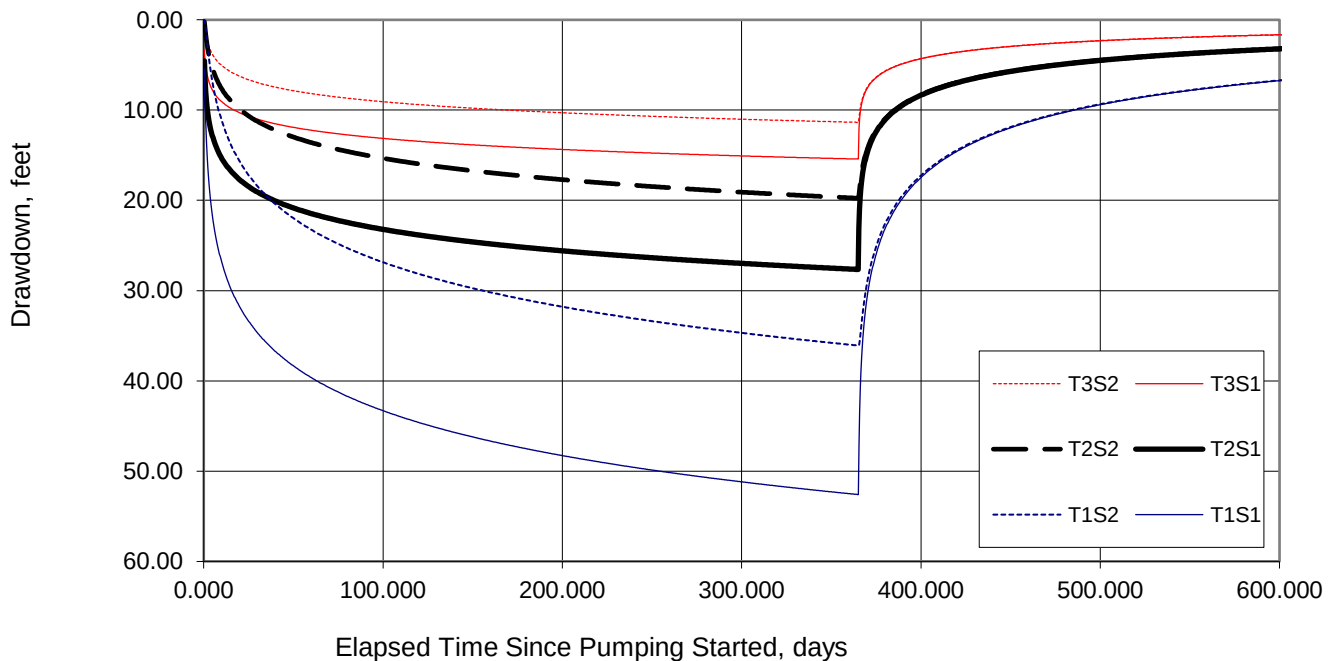


Theis Drawdown Analysis-Well 1Theis Drawdown and Recovery at $r = 585$ ft From Pumping Well

Pump on = 525600 minutes = 365.00 days

Pumping Rate (Q) = 0.067 cfs (30 gpm) ***Theis Drawdown Analysis-Well 2**Theis Drawdown and Recovery at $r = 930$ ft From Pumping Well

Pump on = 525600 minutes = 365.00 days

Pumping Rate (Q) = 0.334 cfs (150 gpm) ***For Both Well 1 and Well 2:**Aquifer Transmissivity (T1)= 320 ft²/day, (T2)= 670 ft²/day, (T3)= 1,300 ft²/dayStorativity (s1) = 2×10^{-4} , (s2) = 2×10^{-3} [Conlon et al 2005, Tables 1 and 2 values for Central MSU]

Water Availability Tables

Water Availability Analysis

Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN

Water Availability as of 3/11/2024

Watershed ID #: 151 ([Map](#))

Exceedance Level: 80% ▾

Date: 3/11/2024

Time: 8:49 AM

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	76.50	934.00	0.00	36.00	898.00
APR	787.00	52.40	735.00	0.00	36.00	699.00
MAY	425.00	50.90	374.00	0.00	36.00	338.00
JUN	224.00	73.00	151.00	0.00	36.00	115.00
JUL	109.00	115.00	-5.87	0.00	36.00	-41.90
AUG	71.00	94.10	-23.10	0.00	36.00	-59.10
SEP	67.30	53.40	13.90	0.00	36.00	-22.10
OCT	91.60	11.50	80.10	0.00	36.00	44.10
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	56,300.00	650,000.00	0.00	26,100.00	626,000.00

MOLALLA R > WILLAMETTE R - AB MILK CR
WILLAMETTE BASIN

Water Availability as of 3/11/2024

Watershed ID #: 70747 ([Map](#))

Exceedance Level: 80% ▾

Date: 3/11/2024

Time: 8:49 AM

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	531.00	1.33	530.00	0.00	300.00	230.00
FEB	541.00	1.32	540.00	0.00	300.00	240.00
MAR	569.00	1.35	568.00	0.00	300.00	268.00
APR	591.00	1.64	589.00	0.00	300.00	289.00
MAY	466.00	5.15	461.00	0.00	300.00	161.00
JUN	207.00	7.28	200.00	0.00	200.00	-0.28
JUL	85.90	12.80	73.10	0.00	100.00	-26.90
AUG	55.70	10.40	45.30	0.00	78.70	-33.40
SEP	54.50	4.24	50.30	0.00	88.90	-38.60
OCT	90.40	1.45	89.00	0.00	166.00	-77.00
NOV	273.00	1.30	272.00	0.00	300.00	-28.30
DEC	560.00	1.34	559.00	0.00	300.00	259.00
ANN	454,000.00	3,020.00	451,000.00	0.00	165,000.00	287,000.00

Stream Depletion Analysis – SW 1

Application type:	G
Application number:	19045
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.544973
Pumping duration (days):	365
Pumping start month number (3=March)	1

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2219	2219	2219	ft
Aquifer transmissivity	T	318.625	675.3	1339.4	ft ² /day
Aquifer storativity	S	0.0002	0.0011	0.002	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	14	14	14	ft
Aquitard thickness below stream	babs	7	7	7	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	30	30	30	ft

