

Groundwater Application Review Summary Form

Application # G- 19290

GW Reviewer Stacey Garrison/Travis Brown Date Review Completed: 6/26/2023

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

June 26 2023

TO: Application G- 19290

FROM: GW: Stacey Garrison/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 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 [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 6/26/2023
 FROM: Groundwater Section Stacey Garrison/Travis Brown
 Reviewer's Name
 SUBJECT: Application G- 19290 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: Ken Lan LLC County: Clackamas

A1. Applicant(s) seek(s) 0.946 cfs from 2 well(s) in the Willamette Basin,
Molalla-Pudding subbasin

A2. Proposed use irrigation & supplemental irrigation Seasonality: March 1 through October 31

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	alluvial	0.946	5S/1E-6 NW-NE	710' S, 2095' W fr NE cor S 6 ^a
2	Proposed	2	alluvial	0.946	5S/1E-6 NW-NE	70' S, 1500' W fr NE cor S 6 ^a

* 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	180 ^b				200	0-25	0-200		TBD			
2	182 ^b				200	0-25	0-200		TBD			

Use data from application for proposed wells.

A4. **Comments:** The POA/POUs are located 3.4 miles east of Hubbard, Oregon. Applicant proposes to irrigate at 0.946 cfs (424.6 gpm) on up to 4.7 ac and supplemental irrigation on 71 ac with a total annual volume limited to 189.25 af/year.
^a 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 descriptions provided in the application for the POA 1 and 2 are 67 ft and 50 ft northwest of the mapped locations respectively; the mapped locations are used for this review.
^b Well head elevation estimated based on LIDAR measurements at well locations (Watershed Sciences, 2009).

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 POA is anticipated to develop 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: _____

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:
- ☒ The permit should contain condition #(s) 7c (7-yrs measurements), medium water use reporting;
 - ☒ 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. 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 Alluvial 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 POA/POU are on Missoula Flood deposits, a Quaternary sequence of bedded silts, sands, and clays up to 80 feet thick in this area (Gannet and Caldwell 1998, O'Connor et al 2001). Based on the proposed depth of the POA, it will likely utilize the Willamette aquifer that underlies the Missoula Flood deposits (Gannet and Caldwell 1998, O'Connor et al 2001). These fluvial terrace deposits include a variety of grain sizes and different degrees of consolidation, resulting in a wide range of hydraulic conductivity values (Woodward et al 1998). Department-located wells within 1 mile of the POAs and utilizing the Quaternary Late Tertiary Sediment (QLTS) aquifer system (CLAC 171, CLAC 1999, CLAC 2000, CLAC 2028, CLAC 2356, CLAC 2378, CLAC 3180, CLAC 5338, CLAC 12673, CLAC 12674, CLAC 12675, CLAC 12676, CLAC 12696, CLAC 12699, CLAC 12701, CLAC 12713, CLAC 50080, CLAC 51287, CLAC 55788, CLAC 62806, CLAC 64841, CLAC 65758, CLAC 66381, CLAC 70824, CLAC 71344, CLAC 73974, and CLAC 76203) identify multiple water-bearing zones, WBZs, ranging from -164 to 136 ft msl, with thickness varying from 3 to 248 ft, and described in well logs as clay, claystone, sand, sandstone, silt, and gravel. The SWLs range from 96 to 173 ft msl and are above the elevation of the top of the respective WBZs, indicating confined conditions. A review of statistics for nearby well records was completed and compared with the proposed rate of 0.946 cfs (424.6 gpm) for this application (see Well Statistics). Median reported well yield is 40 gpm, and the maximum reported yield is 1,000 gpm. The proposed rate for this application is 1,062% of the median and 42% of the maximum reported yield. For the wells within 1 mile and discussed above the maximum yield is 1,000 gpm, the minimum is 25 gpm, and the median is 80 gpm. The proposed rate of use of 0.946 cfs (424.6 gpm) is likely within the capacity of the groundwater resource. Water levels appear to be stable (see Water Level Measurements in Nearby Wells). For the 25 QLTS observation wells within 2 miles of the POAs, 19 show negligible change for the period of record. The maximum declines are approximately 10 ft in CLAC 12612, CLAC 19195, CLAC 2009, and CLAC 2027. There have also been gains of about 20 ft in CLAC 20346 and CLAC 55112. There is not a preponderance of evidence to indicate the groundwater resource is over-appropriated.

The nearest groundwater user to POA 1 is the exempt domestic well serving tax lot 1102 at 29961 Whiskey Hill Road, 884 ft north of the POA at an elevation of ~182 ft msl. A well log could not be associated with this tax lot or address but is likely given the identification of well logs associated with other domestic tax lots in this area (CLAC 66381, CLAC 12673, CLAC 63180, CLAC 12675, CLAC 12675). It is likely the proposed use would cause some degree of well-to-well interference with the domestic well for tax lot 1102. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis-POA 1). Results indicate that the proposed use is not likely to cause

well-to-well interference with the well for tax lot 1102 that exceeds the threshold under the standard condition for alluvial aquifers in the Willamette Basin.

The nearest groundwater user to POA 2 is CLAC 12675 (an exempt domestic well), 463 ft north of the POA at an elevation of ~175 ft msl. CLAC 12675 is sealed to a depth of 19 ft [156 ft msl] with a WBZ from 110 to 124 ft bls [51 to 65 ft msl] and drilled to a depth of 124 ft bls [51 ft msl]. It is likely the proposed use would cause some degree of well-to-well interference with CLAC 12675. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis-POA 2). Results indicate **that the proposed use is likely to cause well-to-well interference with CLAC 12675 that exceeds the threshold under the standard condition for alluvial aquifers in the Willamette Basin.**

Based on this analysis of the available data and under the assumptions previously identified, groundwater for the proposed use is not likely within the capacity of the resource; if a permit is issued for this application, the conditions in B1(d)(i) and B2(c) are recommended to protect senior users and the groundwater resource.

NOTE: This evaluation considers a conservative scenario for the nearest authorized POA not owned by the applicant. Other authorized POAs in the area may also experience an increase in interference as a result of this application, although to a lesser extent than the scenario evaluated here.

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	☒	☐

Basis for aquifer confinement evaluation: The proposed POAs will likely utilize the Willamette Aquifer, which is overlain by an approximately 80 ft thick layer of Missoula Flood deposits (Gannett and Caldwell 1998). Wells using the Willamette Aquifer and within 1 mile of the proposed POAs (CLAC 171, CLAC 1999, CLAC 2000, CLAC 2028, CLAC 2356, CLAC 2378, CLAC 3180, CLAC 5338, CLAC 12673, CLAC 12674, CLAC 12675, CLAC 12676, CLAC 12696, CLAC 12699, CLAC 12701, CLAC 12713, CLAC 50080, CLAC 51287, CLAC 55788, CLAC 62806, CLAC 64841, CLAC 65758, CLAC 66381, CLAC 70824, CLAC 71344, CLAC 73974, and CLAC 76203) are confined, with the SWL above the bottom of the overlying confining layer.

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 ^a	SW Elev ft msl ^b	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Rock Creek	96-173	100-116	1,900	☒	☐	☐	☐	☒
2	1	Rock Creek	96-173	105-121	2,282	☒	☐	☐	☐	☒
1	2	Unnamed trib. to Bear Creek	96-173	127-147	6,000	☒	☐	☐	☐	☒
2	2	Unnamed trib. to Bear Creek	96-173	127-147	5,020	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: The proposed POAs will be cased and sealed continuously to a depth of 25 ft bls [155 and 157ft msl]. SWLs in surrounding wells utilizing the QLTS aquifer vary from 96 to 173 ft msl (see list in C1, above). The local streambed of SW 1 (Rock Creek) is 100 to 121 ft msl and of SW 2 (Unnamed tributary to Bear Creek) is 127 to 147 ft msl, indicating the local groundwater is likely discharging to surface water, consistent with Woodward et al (1998) findings that groundwater discharges to surface water. The WBZs of the wells within a mile range from -164 to 136 ft msl^c; SW 1 (Rock Creek) has not incised below the WBZ elevation, but SW 2 (Unnamed tributary to Bear Creek) appears to have a streambed coincident with WBZ elevations of some wells. Hydraulic connection to nearby streams is likely but anticipated to be inefficient due to the low vertical permeability of the overlying fine-grained sediments.

^a Groundwater elevation calculated from static water level reported in well logs and/or latest static water level reported for CLAC 171, CLAC 1999, CLAC 2000, CLAC 2028, CLAC 2356, CLAC 2378, CLAC 3180, CLAC 5338, CLAC 12673, CLAC 12674, CLAC 12675, CLAC 12676, CLAC 12696, CLAC 12699, CLAC 12701, CLAC 12713, CLAC 50080, CLAC 51287, CLAC 55788, CLAC 62806, CLAC 64841, CLAC 65758, CLAC 66381, CLAC 70824, CLAC 71344, CLAC 73974, and CLAC 76203 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).

^c Water-bearing zone elevations calculated from water-bearing layers reported in well logs CLAC 171, CLAC 1999, CLAC 2000, CLAC 2028, CLAC 2356, CLAC 2378, CLAC 3180, CLAC 5338, CLAC 12673, CLAC 12674, CLAC 12675, CLAC 12676, CLAC 12696, CLAC 12699, CLAC 12701, CLAC 12713, CLAC 50080, CLAC 51287, CLAC 55788, CLAC 62806, CLAC 64841, CLAC 65758, CLAC 66381, CLAC 70824, CLAC 71344, CLAC 73974, and CLAC 76203.

Water Availability Basin the well(s) are located within: PUDDING R>MOLALLA R-AB MILL CR

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%	☒
2	1	☐	☐	NA	NA	☐	67.3	☒	<25%	☒
1	2	☐	☐	NA	NA	☐	67.3	☒	<25%	☒

Comments: The proposed maximum rate (0.946 cfs) exceeds the 1 percent (0.673 cfs) of the 80 percent Natural Flow for SW 1 (Rock Creek) and SW 2 (Unnamed tributary to Bear Creek). The applicant may revise the proposed maximum rate to less than 0.673 cfs (302 gpm) to avoid triggering PSI on this basis without the need for a new groundwater review.

Potential depletion (interference with) SW 1 (Rock Creek) by proposed pumping at proposed POA 1 was estimated using 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) or are within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Morris and Johnson 1967; Heath 1983). 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 1 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 1 and SW 1. Therefore, the interference of both proposed POA with all surface water sources within 1 mile are anticipated to result in much less than 25 percent of the well discharge at 30 days of continuous pumping.

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: NA-Q is not distributed among wells.

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													
(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-streams within 1 mile evaluated above.

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 proposed maximum rate (0.946 cfs) exceeds the 1 percent (0.673 cfs) of the 80 percent Natural Flow for SW 1 (Rock Creek) and SW 2 (Unnamed tributary to Bear Creek). The applicant may revise the proposed maximum rate to less than 0.673 cfs (302 gpm) to avoid triggering PSI on this basis without the need for a new groundwater review.

References Used:

Application File: G-19290

Pumping Test Files: CLAC 12612, CLAC 12647, CLAC 63735, CLAC 12608, CLAC 20346, CLAC 17196, CLAC 18416, CLAC 20074, CLAC 50080, CLAC 12676, CLAC 56198, CLAC 50734

Well Reports: CLAC 171, CLAC 1999, CLAC 2000, CLAC 2028, CLAC 2356, CLAC 2378, CLAC 3180, CLAC 5338, CLAC 12673, CLAC 12674, CLAC 12675, CLAC 12676, CLAC 12696, CLAC 12699, CLAC 12701, CLAC 12713, CLAC 50080, CLAC 51287, CLAC 55788, CLAC 62806, CLAC 64841, CLAC 65758, CLAC 66381, CLAC 70824, CLAC 71344, CLAC 73974, and CLAC 76203

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*, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

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

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

Heath, R.C., 1983. Basic ground-water hydrology, U.S. Geological Survey Water-Supply Paper 2220, 86p.

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.

Morris, D.A. and A.I. Johnson, 1967. Summary of hydrologic and physical properties of rock and soil materials as analyzed by the Hydrologic Laboratory of the U.S. Geological Survey, U.S. Geological Survey Water-Supply Paper 1839-D, 42p

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage: American Geophysical Union transactions, v. 16, p. 519-524.

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

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

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.

D. WELL CONSTRUCTION, OAR 690-200D1. **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**

Oregon Water Resources Department
Water Availability Analysis

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Water Availability Analysis
 Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
 WILLAMETTE BASIN
 Water Availability as of 6/21/2023

Watershed ID #: 151 ([Map](#))
Exceedance Level: 80% v

Date: 6/21/2023
Time: 2:25 PM

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	1,190.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	76.50	933.00	0.00	36.00	897.00
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	48.60	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

Download Data ([Text - Formatted](#), [Text - Tab Delimited](#), [Excel](#))

**Water Availability Analysis**
Detailed ReportsPUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASINWatershed ID #: 151 ([Map](#))
Date: 6/21/2023

Water Availability as of 6/21/2023

Exceedance Level: 80%
Time: 2:26 PM

Water Availability Calculation

Consumptive Uses and Storages

Instream Flow Requirements

Reservations

Water Rights

Watershed Characteristics

Detailed Report of Instream Flow Requirements

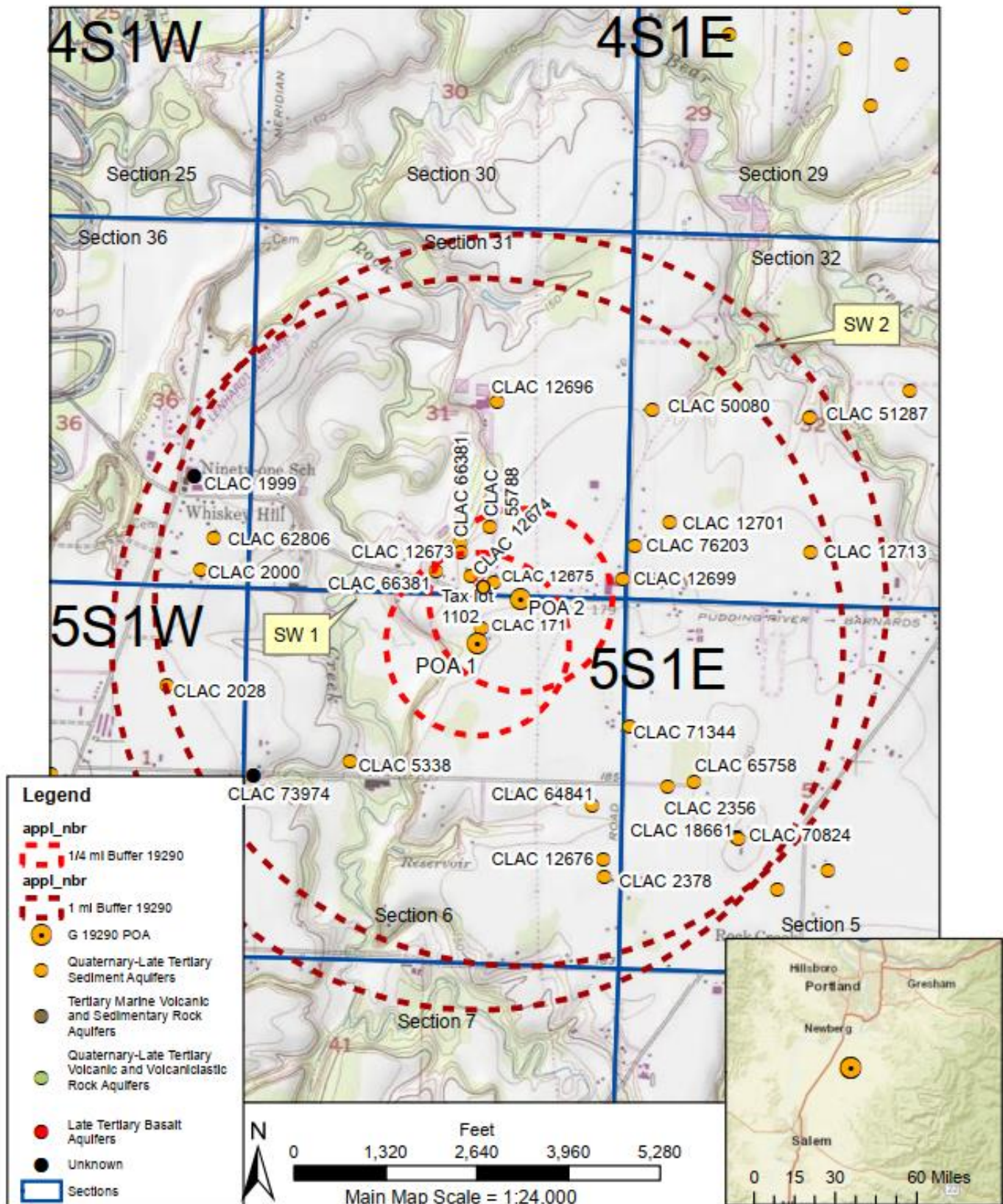
Instream Flow Requirements in Cubic Feet per Second

Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF151A	CERTIFICATE	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
IS73532B	CERTIFICATE	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
IS73533A	CERTIFICATE	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
IS73534A	CERTIFICATE	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Maximum		36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00

Download Data ([Text - Formatted](#), [Text - Tab Delimited](#), [Excel](#))

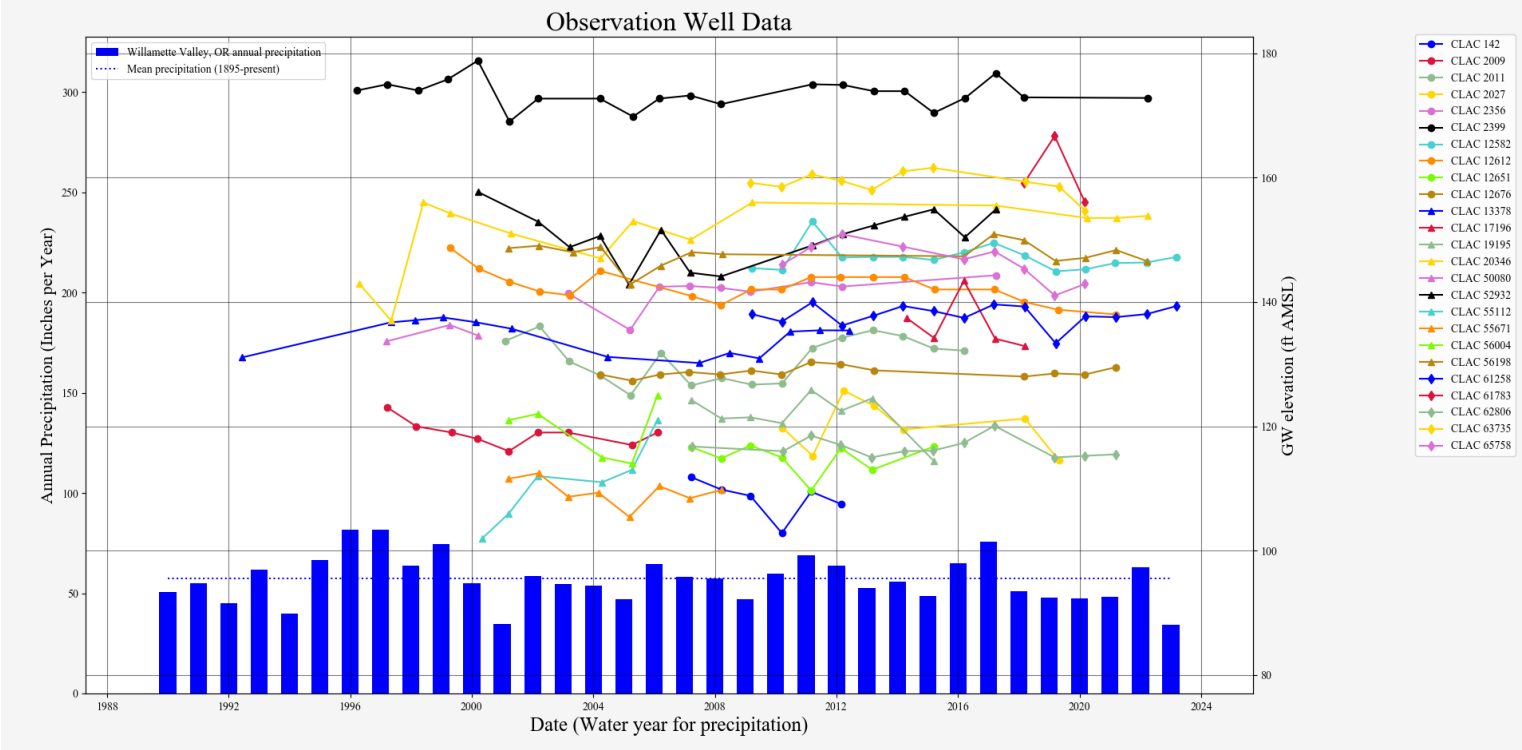
Well Location Map

G19290 Ken Lan LLC

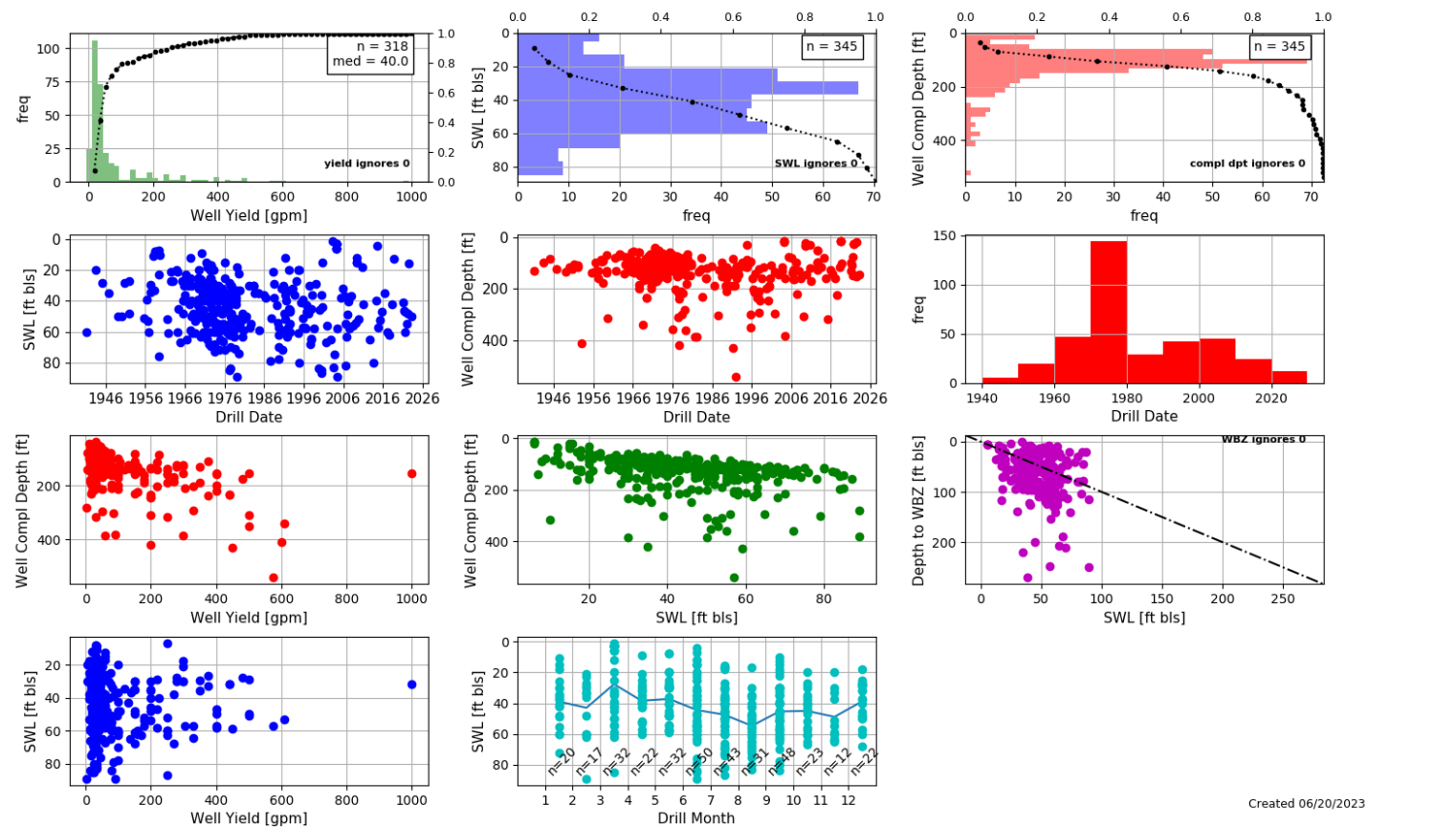


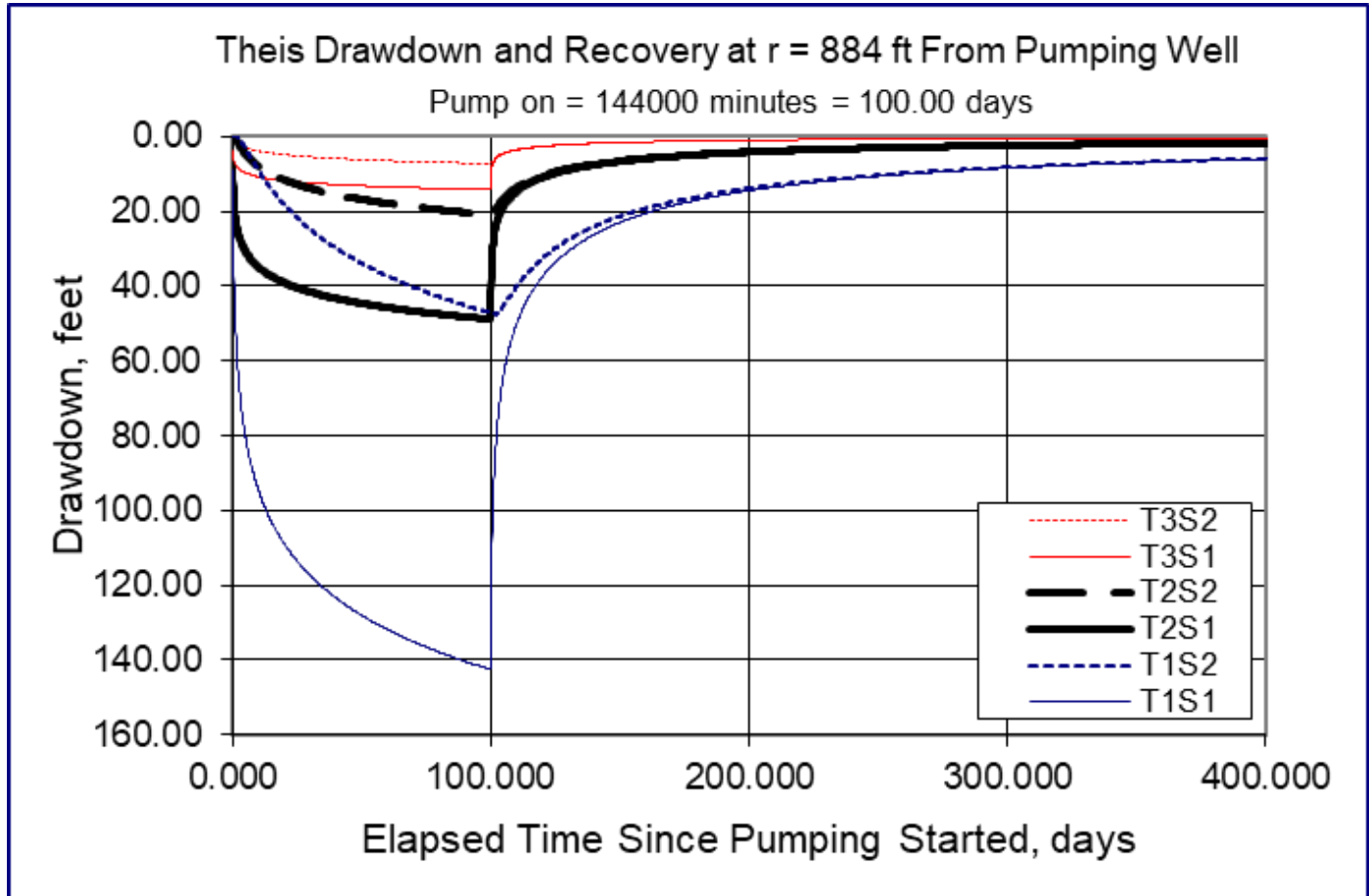
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Water-Level Measurements in Nearby Wells



Well Statistics 5S/1E-6 and surrounding sections



Theis Drawdown Analysis**POA 1**

Radial distance from pumping well (r)=884 ft [estimated radial distance to nearest user, tax lot 1102]

Pumping Rate (Q)= 0.946 cfs (~424.6 gpm)

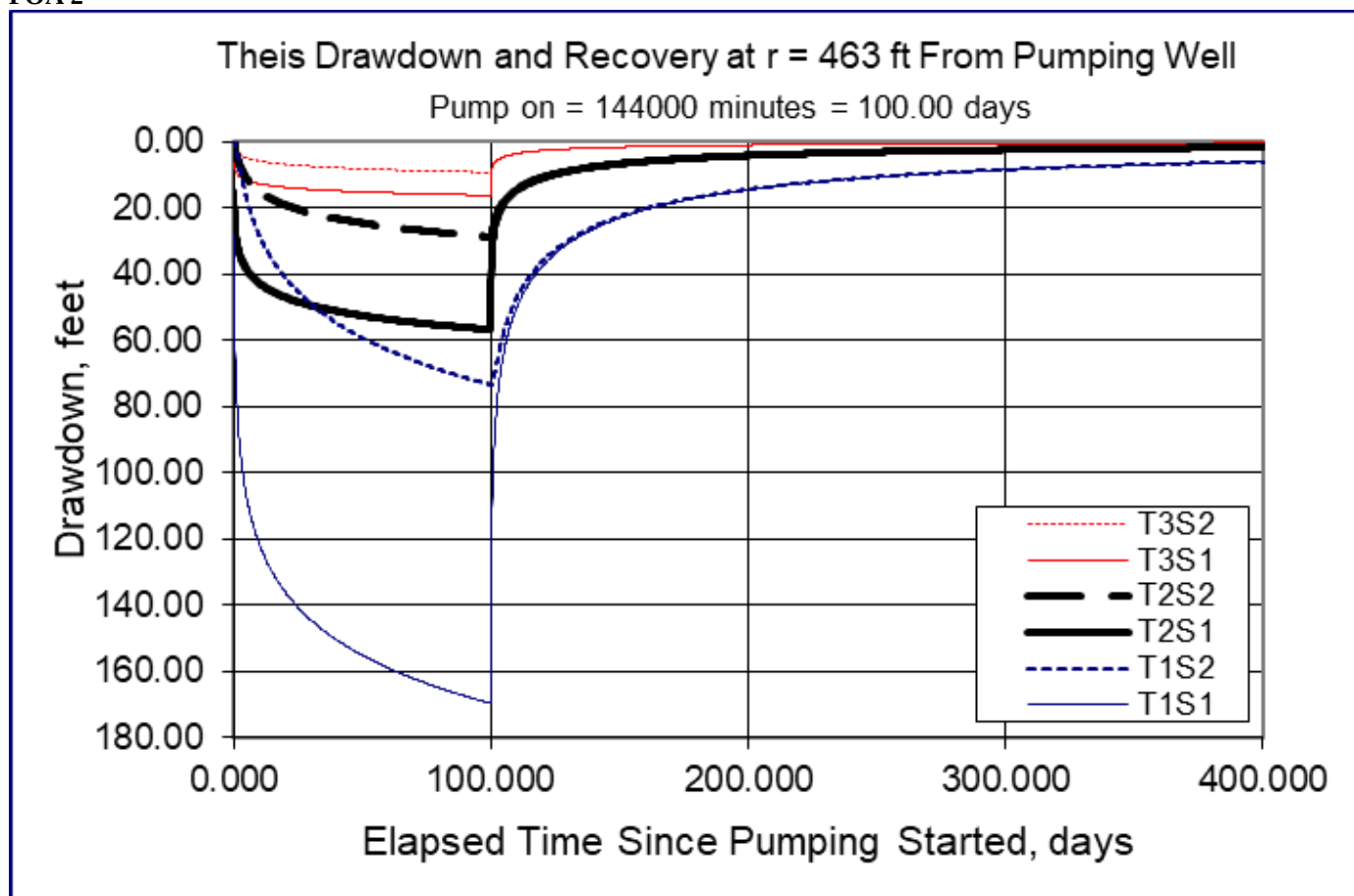
Aquifer Transmissivity (T_1)= 2,318 gpd/ft (310 ft²/day), (T_2)= 7,992 gpd/ft (1,068 ft²/day), (T_3)= 32,059 gpd/ft (4,286 ft²/day)

Storativity (s_1) = 0.0001, (s_2) = 0.01 [Conlon et al 2005, Table 2 values for Middle Sedimentary Unit]

Total pumping time=100 days*

*The full pumping rate could not be utilized continuously for the entire 245-day period of use without exceeding the 189.25 ac-ft maximum allowed duty. For the maximum allowed duty of 189.25 ac-ft, continuous pumping would occur for 100 days at a rate of 0.946 cfs (~424.6 gpm).

POA 2



Radial distance from pumping well (r)=463 ft [estimated radial distance to nearest user, CLAC 12675]

Pumping Rate (Q)= 0.946 cfs (~424.6 gpm)

Aquifer Transmissivity (T_1)= 2,318 gpd/ft (310 ft²/day), (T_2)= 7,992 gpd/ft (1,068 ft²/day), (T_3)= 32,059 gpd/ft (4,286 ft²/day)

Storativity (s_1) = 0.0001, (s_2) = 0.01 [Conlon et al 2005, Table 2 values for Middle Sedimentary Unit]

Total pumping time=100 days*

*The full pumping rate could not be utilized continuously for the entire 245-day period of use without exceeding the 189.25 ac-ft maximum allowed duty. For the maximum allowed duty of 189.25 ac-ft, continuous pumping would occur for 100 days at a rate of 0.946 cfs (~424.6 gpm).

Stream Depletion Analysis – SW 1

Application type:	G	Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Application number:	19290	Distance from well to stream	a	1900.0	1900.0	1900.0	ft
Well number:	1	Aquifer transmissivity	T	310.0	1068.0	4286.0	ft ² /day
Stream Number:	1	Aquifer storativity	S	0.0002	0.003	0.2	-
Pumping rate (cfs):	0.946016	Aquitard vertical hydraulic conductivity	Kva	0.001	0.05	0.1	ft/day
Pumping duration (days):	100.0	Aquitard saturated thickness	ba	73.0	73.0	73.0	ft
Pumping start month number (3=March)	3.0	Aquitard thickness below stream	babs	63	63	63	ft
		Aquitard specific yield	Sya	0.2	0.2	0.2	-
		Stream width	ws	50.0	50.0	50.0	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270
Depletion (%)	0	0	0	1	1	1	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00

