Groundwater Application Review Summary Form

Application # G- 18811

GW Reviewer M. Thoma **Date Review Completed:** 08-21-19

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 08-21 ,20 19

TO: **Application G-** 18811

FROM: **GW:** M. Thoma
(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

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18811

Date: August 27, 2019

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

Applicant's Well #2 (LANE 6274): Based on a review of the Well Report, Applicant's Well #2 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The well log indicates that the well was only sealed to a depth of 6 feet below land surface. In order to meet minimum well construction standards, the well must be continuously cased and continuously sealed to a minimum depth of 18 feet below ground surface. In addition, the diameter of the well bore in the sealing interval is inadequate. The well log indicates a borehole diameter of 8 inches to the bottom of the seal. The borehole diameter for the 5 inch casing should be a minimum of 9 inches. In order to meet minimum well construction standards, the annular seal for the well must be re-drilled to a minimum depth of 18 feet below land surface and the annular seal void filled with an appropriate grout seal.

My recommendation is that the Department **not issue** a permit for Applicant's Well #2 (LANE 6274) unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

Bringing Applicant's Well #2 into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
JAN 21969
STATE ENGINEER
SALEM OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

LANE
6274
State Well No. 15/4w-30
State Permit No.

(1) OWNER:
Name Mr. Clarry A. Ottosen
Address 1040 Gilman Drive, Colma, California

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☒
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☐ Welded ☒
5" Diam. from +6" ft. to 24.6 ft. Gage .258
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? ☒ Yes ☐ No.
Type of perforator used torch
Size of perforations 3/8 in. by 6 in.
46 perforations from 25 ft. to 20.6 ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 12.6 ft. below land surface Date 9-30-68
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No. If yes, by whom? Driller
Yield: 250 gal./min. with 7 ft. drawdown after 1 hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used Ben tonite
Depth of seal 6 ft.
Diameter of well bore to bottom of seal 8 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☐ Yes ☒ No
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County Lane Driller's well number
¼ ¼ Section 30 T. 15S R. 4W W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing 0
Depth drilled 25 ft. Depth of completed well 25 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
Soil	0	4	
Sand & Gravels(tight)	4	16	
Sand & gravels(loose)	16	25	12.6ft

Work started 9-30 1968 Completed 9-30 1968
Date well drilling machine moved off of well 9-30 1968

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Carl Steele (Drilling Machine Operator) Date Nov 7, 1968
Drilling Machine Operator's License No. 386

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME Pitcher Pump & Drilling Co. (Person, firm or corporation) (Type or print)
Address 255 W 5th, Junction City, Oregon
[Signed] Carl Steele (Water Well Contractor)
Contractor's License No. 494 Date Nov 7, 1968

(USE ADDITIONAL SHEETS IF NECESSARY)

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 08/21/2019

FROM: Groundwater Section M Thoma
Reviewer's Name

SUBJECT: Application G- 18811 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: **Bruce Anderson and Katherine Garvey** County: **Lane**

A1. Applicant(s) seek(s) 0.425 cfs from 1 well(s) in the Willamette Basin, Upper Willamette subbasin

A2. Proposed use Irrigation (32 ac) 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	LANE 6274	2	Alluvium	0.425	15S/04W-30 SESW	2200'S, 20'W of ctr of S 30
2						

* 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	315		12.6	09/30/1968	25	0-6	+6-24.6	-	-	250		

Use data from application for proposed wells.

A4. **Comments:**

A5. ☐ **Provisions of the** Willamette (OAR 690-502) 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 (Annual SWL); Medium Water-Use Reporting**;
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☐ **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately_____ ft. and_____ ft. below land surface;

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** There is limited water level data in the aquifer and vicinity of the applicant's proposed POA, but a thorough analysis recharge and discharge has not been performed so Over-Appropriation and Capacity of the Resource cannot be determined and so water-level reporting conditions in B1(d) are recommended. There are several permitted groundwater rights and registrations within 1 mile of the applicant's proposed POA but it is unlikely that the applicant's use would result in injury to these permitted water rights given the moderately high transmissivity and high storativity of the aquifer in the area and its thickness. However, standard interference conditions should be applied

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	**Older Alluvium of Willamette Valley**	☐	☒
		☐	☐

Basis for aquifer confinement evaluation: Wells penetrating shallow alluvial deposits in the Willamette Valley typically encounter unconfined aquifer conditions; additionally, well logs for the area generally report similar SWL depths regardless of "First Water" depth implying a single aquifer unit

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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Willamette River**	**300**	**300-310**	**12600**	☒	☐	☐	☐	☒
1	**2**	**Long Tom River**	**300**	**290-310**	**11760**	☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: groundwater elevations are similar to surface water elevation implying that water moves freely between surface water and groundwater; there is little relief between the Willamette River watershed and the Long Tom River watershed so there is potential for groundwater impacts from the proposed use to affect the Long Tom River

Water Availability Basin the well(s) are located within: WILLAMETTE R > COLUMBIA R – AB PERIWINKLE CR AT GAGE 14174 **also hydraulically connected to** Long TOM R > WILLAMETTE R – AB MOUTH

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
		☐	☐			☐		☐		☐

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: no surface water sources were evaluated within 1 mile

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 – SW #1: Willamette River													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	**1**	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**
Interference CFS													
(A) = Total Interf.		**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**
(B) = 80 % Nat. Q		**10100**	**11600**	**11000**	**9760**	**8430**	**5360**	**3270**	**2560**	**2540**	**2860**	**4170**	**8150**
(C) = 1 % Nat. Q		**101**	**116**	**110**	**97.4**	**84.3**	**53.6**	**32.7**	**25.6**	**25.4**	**28.6**	**41.7**	**81.5**
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**

Non-Distributed Wells – SW #2: Long Tom River													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	**1**	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**	**0.425**
Interference CFS													
(A) = Total Interf.		**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**	**< 0.04**
(B) = 80 % Nat. Q		**568**	**697**	**596**	**373**	**215**	**105**	**50.6**	**35.4**	**32.1**	**35.3**	**82.5**	**364**
(C) = 1 % Nat. Q		**5.68**	**6.97**	**5.96**	**3.73**	**2.15**	**1.05**	**0.51**	**0.35**	**0.32**	**0.35**	**0.82**	**3.64**
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**	**< 1%**

(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: results of stream-depletion modeling for the proposed use show that impacts to either surface water source will likely be less than 10% of the rate of appropriation.

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:** The applicant's proposed POAs would be producing from an aquifer that has been found to be hydraulically connected to surface water – specifically the Willamette River and Long Tom River at a distance of over 1 mile. The proposed maximum rate of appropriation is less than 1% of the pertinent adopted perennial streamflow for each month of the WAB. Therefore, per OAR 690-009-0040(4) the POAs are assumed to **not** have the Potential for Substantial Interference

References Used:

Gannett, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington.* USGS Professional Paper 1424-A.

Herrera, N. B., Burns, E. R., and T. D. Conlon. 2014. *Simulation of Groundwater Flow and the Interaction of Groundwater and Surface Water in the Willamette Basin and Central Willamette Subbasin*, Oregon. USGS Scientific Investigations Report 2014-5136.

McClaughry, J. D., T. J. Wiley, M. L. Ferns, and I. P Madin. 2010. *Digital Geologic Map of the Southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon.* Oregon Dept. of Geology and Mineral Industries. Open File Report O-10-13.

O'Conner, J. E., A. Sarna-Wojcicki, K. C. Wozniak, D. J. Polette, and R. J. Fleck. *Origin, Extent, and Thickness of Quaternary Geologic Units in the Willamette Valley, Oregon*. USGS Professional Paper 1620

Oregon Department of Geology and Mineral Industries, *Geologic Map of Oregon*. http://www.oregongeology.org/geologicmap/

OWRD Well Log Database – Accessed 08/21/2019

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** 1 **Logid:** LANE 6274

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:** reported seal depth is 6 ft

D4. ☒ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

Water Availability Analysis
Detailed Reports

WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174
WILLAMETTE BASIN

Water Availability as of 8/21/2019

Watershed ID #: 30200321 (Map) Exceedance Level: 80%
Date: 8/21/2019 Time: 12:53 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	10,100.00	1,370.00	8,730.00	0.00	1,750.00	6,980.00
FEB	11,600.00	4,290.00	7,310.00	0.00	1,750.00	5,560.00
MAR	11,000.00	4,560.00	6,440.00	0.00	1,750.00	4,690.00
APR	9,760.00	4,260.00	5,500.00	0.00	1,750.00	3,750.00
MAY	8,430.00	2,560.00	5,870.00	0.00	1,750.00	4,120.00
JUN	5,360.00	856.00	4,500.00	0.00	1,750.00	2,750.00
JUL	3,270.00	665.00	2,600.00	0.00	1,750.00	855.00
AUG	2,560.00	604.00	1,960.00	0.00	1,750.00	206.00
SEP	2,540.00	518.00	2,020.00	0.00	1,750.00	272.00
OCT	2,860.00	269.00	2,590.00	0.00	1,750.00	841.00
NOV	4,170.00	354.00	3,820.00	0.00	1,750.00	2,070.00
DEC	8,150.00	379.00	7,770.00	0.00	1,750.00	6,020.00
ANN	7,460,000.00	1,240,000.00	6,230,000.00	0.00	1,270,000.00	4,960,000.00

Water Availability Analysis
Detailed Reports

LONG TOM R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 8/21/2019

Watershed ID #: 114 (Map) Exceedance Level: 80%
Date: 8/21/2019 Time: 12:53 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	568.00	149.00	419.00	0.00	0.00	419.00
FEB	697.00	389.00	308.00	0.00	0.00	308.00
MAR	596.00	555.00	41.00	0.00	0.00	41.00
APR	373.00	250.00	123.00	0.00	0.00	123.00
MAY	215.00	63.80	151.00	0.00	0.00	151.00
JUN	105.00	29.50	75.50	0.00	0.00	75.50
JUL	50.60	47.80	2.83	0.00	0.00	2.83
AUG	35.40	38.80	-3.36	0.00	0.00	-3.36
SEP	32.10	21.40	10.70	0.00	0.00	10.70
OCT	35.30	5.69	29.60	0.00	0.00	29.60
NOV	82.50	5.45	77.00	0.00	0.00	77.00
DEC	364.00	106.00	258.00	0.00	0.00	258.00
ANN	362,000.00	99,300.00	262,000.00	0.00	0.00	262,000.00

Well Location Map