

Approved:



MEMO

To: Kristopher Byrd, Well Construction Section Manager
From: Tommy Laird, Well Construction Program Coordinator
Subject: Re-Review of Water Right Application LL-1919
Date: December 12, 2023

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Dennis Orłowski reviewed the application. Please see Dennis' Groundwater Review and the Well Report.

Well #1 (WASH 12670): Based on a review of the Well Report and photo of the wellhead, the construction of Well #1 seems to protect the groundwater resource.

The construction of Well #1 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.

WASH

WATER WELL REPORT

012670

STATE OF OREGON

RECEIVED

SEP 10 1973

State Well No.

25/aw-16

cb

(Please type or print)

STATE ENGINEER

(Do not write above this line)

SALEM, OREGON

State Permit No.

(1) OWNER:

Name L. S. BARNARD
Address RT 4, Box 333 Sherwood, Ore.

(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

(5) CASING INSTALLED:

Threaded Welded
6" Diam. from 0 ft. to 80 ft. Gage 250
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:

Perforated? Yes No.

Type of perforator used _____

Size of perforations _____ in. by _____ in.
_____ 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) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? Yes No If yes, by whom? Operator
Yield: 20 gal./min. with 34 ft. drawdown after 2 hrs.
" " " " " "
" " " " " "
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m.

Temperature of water 54 Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:

Well seal—Material used Cement Grout
Well sealed from land surface to 80 ft.
Diameter of well bore to bottom of seal 9 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 16 sacks
Number of sacks of bentonite used in well seal _____ sacks
Brand name of bentonite _____
Number of pounds of bentonite per 100 gallons _____
of water _____ lbs./100 gals.
Was a drive shoe used? Yes No Plugs _____ Size: location _____ ft.
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.

(10) LOCATION OF WELL:

County WASH Driller's well number 365
NW 1/4 SW 1/4 Section 16 T. 2S R. 2W W.M.
Bearing and distance from section or subdivision corner _____

(11) WATER LEVEL: Completed well.

Depth at which water was first found _____ ft.
Static level 39 ft. below land surface. Date 8-29-73
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:

Diameter of well below casing 6"
Depth drilled 95 ft. Depth of completed well 95 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 and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Brown Soil	0	2	
Brown Clay	2	6	
Red Clay	6	32	
Brown Shale	32	64	
Medium Hard Gray Basalt	64	88	
Brown Porous Basalt (water)	88	92	39
Medium Hard Gray Basalt	92	95	

Work started 8-29 19 73 Completed 8-30 19 73
Date well drilling machine moved off of well 8-30 19 73

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] Raymond A. Borchers Date 8-30, 19 73
(Drilling Machine Operator)
Drilling Machine Operator's License No. 305

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 Ray Borchers - Well Drilling
(Person, firm or corporation) (Type or print)
Address RT 3, Box 271A Sherwood Ore.
[Signed] Raymond A. Borchers
(Water Well Contractor)
Contractor's License No. 404 Date 8-30, 19 73



Groundwater Application Review Summary Form

Application # LL- 1919

GW Reviewer Dennis Orłowski Date Review Completed: May 4, 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

May 4, 2023

TO: Application LL- 1919

FROM: GW: Dennis Orłowski
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

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 [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 May 4, 2023
 FROM: Groundwater Section Dennis Orłowski
 Reviewer's Name
 SUBJECT: Application LL- 1919 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: John Nunamaker County: Washington

A1. Applicant(s) seek(s) 0.033 cfs from one well(s) in the Willamette Basin,
Tualatin subbasin

A2. Proposed use Irrigation to establish hazelnut plantings (20.0 acres) Seasonality: April 1 – Sept 30

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	WASH 12670	--	CRBG	0.033	T2S/R2W-16 NW-SW	1710' N, 665' W fr S ¼ cor

* 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	250	--	39	8/29/1973	95	0-80	0-80	--	--	20	34	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is located within the Chehalem Mountains Groundwater Limited Area, which has special groundwater use limitations summarized in A6.

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 (WASH 12670) obtains groundwater from a confined Columbia River Basalt Group (CRBG) aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin rules do not apply.

A6. **Well(s) #** 1, _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction. Name of administrative area: **Chehalem Mountains Groundwater Limited Area (GWLA)**

Comments: Groundwater in the basalt aquifers in the Chehalem Mountain Groundwater Limited Area (GWLA) is classified for exempt uses, irrigation, and rural residential fire protection systems only. Permits may be issued, for a period not to exceed five years, for fire protection and for drip or equally efficient irrigation provided the Director finds the proposed use and amount do not pose a threat to the groundwater resource or existing permit holders. The amount of water used for irrigation shall be further limited to one acre-foot per acre per year. Permits may be extended for additional five-year periods if the Director finds that the groundwater resource can probably support the extended use (OAR 690-502-0200 (1)).

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) Large water-use reporting; 7I (Willamette CRB condition);
 - 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 Columbia River Basalt Group 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, WASH 12670, a relatively shallow well at 95 feet total depth, obtains groundwater from a water-bearing zone in the Columbia River Basalt Group (CRBG) aquifer system. The CRBG in this area consists of a series of lava flows/basalt layers with a composite thickness that ranges from 800 to 1000 feet (Conlon et al., 2005). Each layer is characterized by a series of internal features, including a thin rubble zone at the contact between flows and a thick, dense, low porosity and low permeability interior zone. In some cases, sedimentary layers were deposited during the time between basalt flow emplacements. A flow top, sedimentary interbed and flow bottom are collectively referred to as an “interflow zone”. Unconfined groundwater can occur near the weathered top of the basalts, but most water occurs under confined conditions in deeper interflow zones at the contacts between lava flows. CRBG flow features result in a series of stacked, thin aquifers that are confined by dense flow interiors. The low permeability of the basalt flow interiors usually results in little connection between stacked aquifers, which generally results in tabular aquifers with unique water level heads (Reidel et al., 2002).

Groundwater elevations in area CRBG wells are moderately variable due to a high range of different completion depths and elevations (see attached hydrograph); therefore, much of this data is not applicable to the relatively very shallow WASH 12670. Data from WASH 12679 and WASH 12682 appear to be most applicable, given similar water levels; since ~1988 water levels in WASH 12682 have been relatively stable.

The potential for injury due to the proposed use is unlikely given (1) the proposed POA WASH 12670 is much shallower than all or most nearby wells, and (2) the low proposed maximum pumping rate is unlikely to cause any appreciable well interference. However, to protect existing users, water use reporting and water level monitoring conditions are recommended.

SPECIAL GWLA CONDITION: If issued, the permit should also include relevant limitations of the Chehalem Mountain GWLA, including type and quantity of use, the 5-year time limit, and best management practices that maximize the efficiency of water use.

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	CRBG	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Both the proposed POA (WASH 12670) and other nearby CRBG well logs report static water levels above respective water-bearing zones, indicating a confined aquifer or series of aquifers.

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	Unnamed tributary to Heaton Creek	190-210 (est)	150-215	1150	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Heaton Creek	190-210 (est)	125-165	3150	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	3	McFee Creek	190-210 (est)	115-140	2500	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Groundwater elevation range was estimated based on original 1973 log entry (39 ft bls, ~ elev. 210 ft msl) and accounting for moderate declines experienced in similar wells since that time.

The estimated range of groundwater elevations at the proposed POA is coincident with SW1 in the area where the creek has incised through the CRBG aquifer system (the SW1 elevations shown above are within approximately one mile of Well 1). Groundwater in the upland areas likely discharges to surface water where the CRBG water-bearing zones intersect the stream, providing baseflow to sustain perennial reaches of the stream. These facts indicate hydraulic connection with SW1, but not the other two perennial stream reaches within one mile.

Water Availability Basin the well(s) are located within: WID 30201001: McFee Creek > Tualatin River – at 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 (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?	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 checked="" type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	1.90	<input checked="" type="checkbox"/>	See comment	<input checked="" 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"/>

Comments: C3a: there is no readily-available analytical model than can be used to estimate stream depletion impacts from wells that obtain groundwater from CRBG aquifers.

PSI is triggered because the proposed rate 0.033 cfs (~15 gpm) is greater than 1% of natural streamflow (1.9 cfs). If the requested rate is dropped to 0.019 cfs, the PSI finding will likely be removed.

C3b: not applicable.

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: Not applicable.

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: None.

References Used:

Application LL-1919.

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.

Reidel, S.P., Johnson, V.G., and Spane, F.A., 2002, Natural gas storage in basalt aquifers of the Columbia Basin, Pacific Northwest USA—A guide to site characterization: Richland, Wash., Pacific Northwest National Laboratory, 277 p.

US Geological Survey Scholls, Oregon Topographic Quadrangle Map.

OWRD water level database, includes reported water levels, accessed 5/3/2023.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

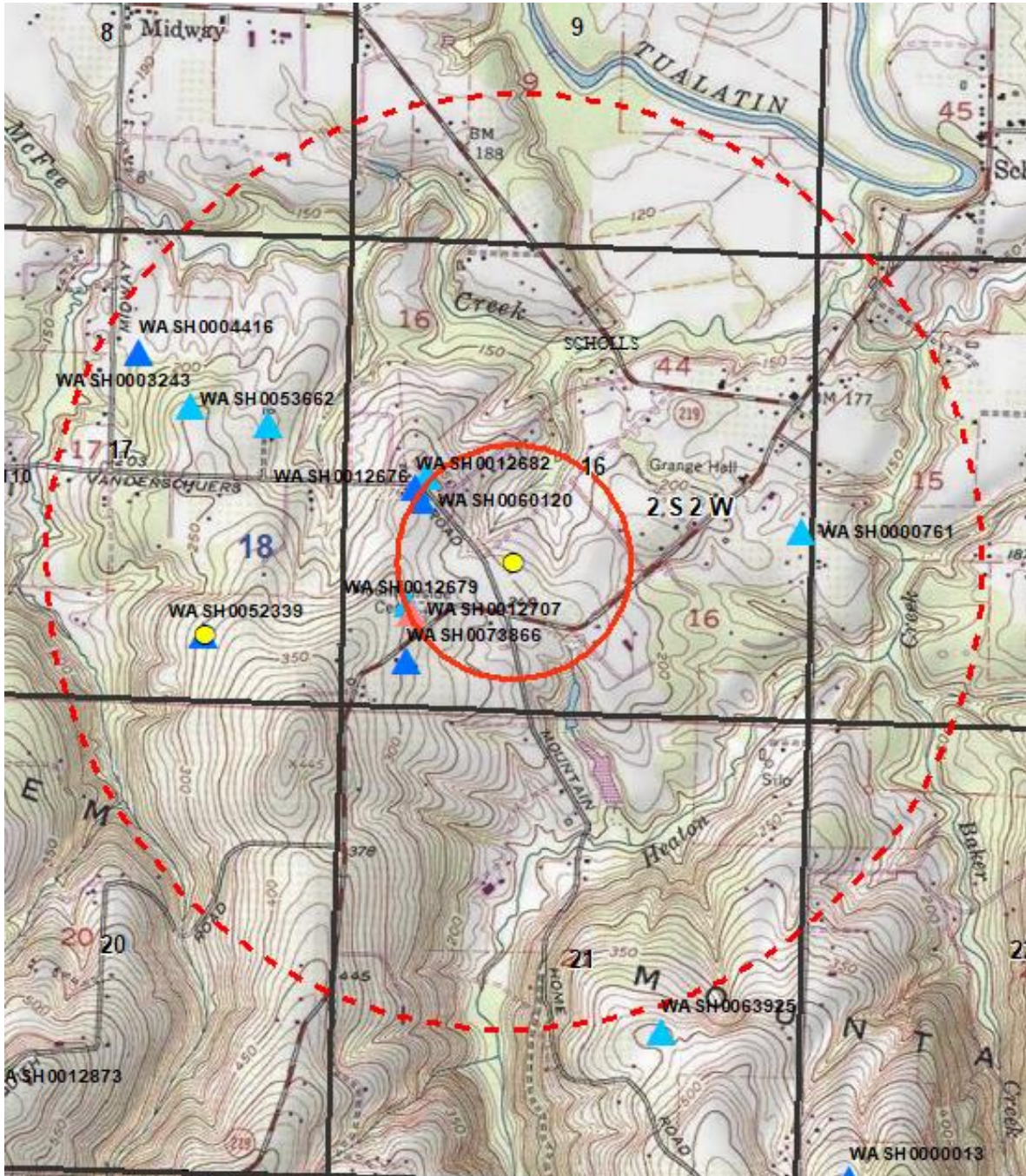
D2. **THE WELL does not appear to meet current well construction standards based upon:**

- 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



Water Availability Table

Oregon Water Resources Department
Water Availability Analysis

Main Help
Return Contact Us

Water Availability Analysis
Detailed Reports

MCREE CR > TUALATIN R - AT MOUTH
WILLAMETTE BASIN
Water Availability as of 5/4/2023

Watershed ID #: 30201001 [\(Map\)](#)
Date: 5/4/2023

Exceedance Level: 80%
Time: 10:25 AM

Water Availability Calculation | Water Rights | Consumptive Uses and Storages | Instream Flow Requirements | Watershed Characteristics | Reservations

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	36.60	0.88	35.70	0.00	0.00	35.70
FEB	42.00	0.88	41.10	0.00	0.00	41.10
MAR	34.20	0.75	33.50	0.00	0.00	33.50
APR	21.60	0.69	20.90	0.00	0.00	20.90
MAY	11.70	3.09	8.61	0.00	0.00	8.61
JUN	5.40	3.78	1.62	0.00	0.00	1.62
JUL	3.02	5.21	-2.19	0.00	0.00	-2.19
AUG	2.22	4.48	-2.26	0.00	0.00	-2.26
SEP	1.97	2.43	-0.46	0.00	0.00	-0.46
OCT	1.90	0.41	1.49	0.00	0.00	1.49
NOV	5.34	0.48	4.86	0.00	0.00	4.86
DEC	25.20	0.95	24.40	0.00	0.00	24.40
ANN	22,300.00	1,450.00	21,100.00	0.00	0.00	21,100.00

Water-Level Measurements in Nearby Wells

Observation Well Data

