

Groundwater Application Review Summary Form

Application # G- 18739

GW Reviewer DENNIS DRLOWSKI Date Review Completed: 5/22/2019

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.

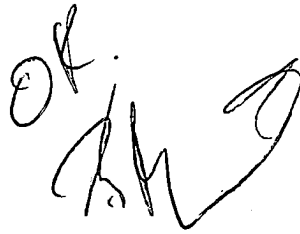
Summary of Well Construction Assessment:

[] 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.

5/22/19

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

MEMO



To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18739
Date: May 29, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Dennis Orlowski reviewed the application. Please see Dennis's Groundwater Review and the Well Logs.

Applicant's Well #1 (MARI 16010): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

The construction of Applicant's Well #1 may not satisfy hydraulic connection issues.

Applicant's Well #Greenhouse Well (MARI 16018): Based on a review of the well report, Applicant's Well #Greenhouse Well does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). According to the Water Supply Well Report, only 4 sacks of cement were used for the well seal. A calculated minimum of 12 sacks of cement should have been used. In order to meet minimum well construction standards, the well must be resealed with an approved grout to a minimum depth of 18 feet below ground surface.

My recommendation is that the Department **not issue** a permit for Applicant's Well #Greenhouse Well 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 #Greenhouse Well (MARI 16018) into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well #2 (MARI 16019): 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). According to the Well Report "Bentonite and Drill Cuttings" were used as an annular seal material. Drill Cuttings are not allowed within the sealing interval of a well. In order to meet minimum well construction standards, the well must be resealed with an approved

grout.

My recommendation is that the Department **not issue** a permit for Applicant's Well #2 (MARI 16019) 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 (MARI 16019) into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well #Shop Well (MARI 16020): Based on a review of the Well Report, Applicant's Well #Shop Well does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). According to the Well Report, Bentonite and Drill Cuttings were used as an annular seal material. Drill Cuttings are not allowed within the sealing interval of a well. In order to meet minimum well construction standards, the well must be resealed with an approved grout.

My recommendation is that the Department not issue a permit for Applicant's Well #Shop Well (MARI 16020) 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 #Shop Well (MARI 16020) 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

RECEIVED
JUN 27 1973

MAR 11 1973

16008

WATER WELL REPORT

STATE OF OREGON

State Well No. 105/2W-4

STATE ENGINEER, SALEM, OREGON
within 30 days from the date of well completion.

STATE ENGINEER
SALEM OREGON
(Do not write above this line)

State Permit No. _____

(1) OWNER:

Name WILYER HARSTER CO
Address TACOMA WASHINGTON 98401

(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
10" Diam. from 1 ft. to 35 ft. Gage 2.50
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:

Perforated? Yes No.
Type of perforator used TORCH
Size of perforations 3/8 in. by 6 in.
120 perforations from 19 ft. to 34 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? MILLER
600 gal./min. with 5 ft. drawdown after 4 hrs.
" " " " " "
" " " " " "
Bailer test gal./min. with ft. drawdown after hrs.
" " " " " "
" " " " " "

(9) CONSTRUCTION:

Well seal—Material used CEMENT
Well sealed from land surface to 18 ft.
Diameter of well bore to bottom of seal 14 in.
Diameter of well bore below seal 10 in.
Number of sacks of cement used in well seal 4 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 WASCO Driller's well number _____
1/4 1/4 Section 4 T. 10 S. R. 2 W.M.
Bearing and distance from section or subdivision corner _____

(11) WATER LEVEL: Completed well.

Depth at which water was first found 10 ft.
Static level 10 ft. below land surface. Date 6-16-73
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:

Diameter of well below casing 10 ft.
Depth drilled 35 ft. Depth of completed well 35 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	3	
CLAY - SANDY	3	12	
CLAY & SAND			
GRAVEL			
BROWN - SAND & MEDIUM GRAVEL	12	28	
TO LARGE Boulders			
MED. SAND & GRAVEL WITH SOME CLAY	28	34	

Work started 6-13-1973 Completed 6-16-1973
Date well drilling machine moved off of well 6-16-1973

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] Bill Letters Date 6-19, 1973
(Drilling Machine Operator)
Drilling Machine Operator's License No. 621

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 Miller & West
(Person, firm or corporation) (Type or print)
Address 5875 GAFFIN RD. S.E.
[Signed] Harlan R. Miller
(Water Well Contractor)
Contractor's License No. 37 Date 6-19-1973

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 05/22/2019
 FROM: Groundwater Section Dennis Orłowski
 Reviewer's Name
 SUBJECT: Application G- 18739 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: Weyerhaeuser NR Company County: Marion

A1. Applicant(s) seek(s) 10.79 cfs from 4 well(s) in the Willamette Basin,
North Santiam River subbasin

A2. Proposed use Temperature Control (TC) Seasonality: October through May

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	MARI 16010	Well 1	Alluvium	10.79	T10S/R2W-4 SE-SW	250' N, 1940' E fr SW cor S4 (note 1)
2	MARI 16018	Greenhouse Well	Alluvium	10.79	T10S/R2W-4 SE-SW	250' N, 2000' E fr SW cor S4 (note 1)
3	MARI 16019	Well 2	Alluvium	10.79	T10S/R2W-9 SW-NW	1760' S, 1250' E fr NW cor S9 (note 1)
4	MARI 16020	Shop Well	Alluvium	10.79	T10S/R2W-4 SW-SW	420' N, 1150' E fr SW cor S4 (note 1)

* 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	286	--	7.67	11/17/1967	30	0-18	0-30	--	18-30	2975	3.5	Pump
2	287	--	10	6/16/1973	35	0-18	+1-35	--	19-34	600	0.5	Pump
3	283	--	11	7/1/1990	50	0-19	+1-33	--	17-33	2770	13	Pump
4	285	--	11	5/26/1970	40	0-20	+1-40	--	22-40	1000	11	Pump

Use data from application for proposed wells.

A4. **Comments:** Note 1: compared to the PLSS data and georeferenced aerial imagery used by OWRD, these "metes and bounds" location descriptions, which are those provided in the application, appear to be uniformly offset by about 180 ft to the SSE. This discrepancy is evident by noting the described well locations relative to buildings and other structures as plotted on the application map: the "metes and bounds" descriptions uniformly place the wells about 180 ft SSE from the same locations shown on the application map. **Therefore, for this review the well locations as plotted on the application map were evaluated, and NOT the "metes and bounds" locations shown in this Table A3 (and the application).**

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: One of the four proposed POAs, MARI 16019, obtains groundwater from an unconfined alluvial aquifer and is located less than 1/4 mile from the North Santiam River. Therefore, the provisions of OAR 690-502-0240 are activated for MARI 16019. The other three wells also produce from an unconfined aquifer but are located greater than 1/4 mile from the river, so OAR 690-502-0240 does not apply to those wells.

A6. Well(s) # _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: _____
 Comments: Not applicable.

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 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, 7N (annual measurements);
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
- b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
- c. **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

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

- B3. **Groundwater availability remarks:** The application is not consistent regarding the requested total maximum rate versus individual well rates. Section 3 notes 10.79 cfs for the total requested maximum rate, with no well-specific rates provided on the Section 3 table; in that case, the full 10.79 cfs would be evaluated for each of the four proposed POAs. However, Section 10 does indicate proposed general allocations for the four proposed POAs: "The 52.6 acres TC (10.07 cfs) will come from Wells 1 (MARI 16010) and 2 (MARI 16019) and the 3.0 acres TC plus the 4.4 acres TC (0.72 cfs) will come from the Greenhouse well (MARI 16018) and/or the Shop Well (MARI 16020)." This distribution is reasonable given the relative well yields reported on well logs for the proposed POAs: MARI 16010 and MARI 16019 report relatively much greater yields and specific capacity values than MARI 16018 and MARI 16020, ranging from 6.2 to 6.6 cfs for the former two wells versus lower 1.3 to 2.2 cfs for the latter two wells. Additional information confirming these general well-specific rates was subsequently provided to OWRD by the applicant's agent (5/20/2019 e-mail from Will McGill (CWRE) to Barbara Poage (OWRD), attached to this review).

Although currently unlikely, it is possible that Well 1 or Well 2 could potentially produce the full 10.07 cfs (~4520 gpm) individually, particularly if either well were to be deepened in the future. Therefore, for injury potential and PSI the conservative scenario evaluated for this review was either Well 1 (MARI 16010) or Well 2 (MARI 16019) pumping individually at a maximum 10.07 cfs rate.

Furthermore, Section 5 of the application lists a total requested annual volume of 642 acre-feet. Additional information provided by the applicant's agent (see attached e-mail) explained that the requested 642 acre-feet is primarily based on pumping 10.07 cfs for spraying on 52.6 acres over a total 30-day period of usage, i.e., during major freezing events each year. Additional volume is requested to provide additional TC for another 7.4 acres that are insufficiently covered by existing TC water rights. The requested 642 acre-feet of annual volume equates to 10.7 acre-feet/acre.

MARI 16010, 16018, and 16019 are also authorized POAs for three other groundwater certificates for irrigation and temperature control; however, those total allocations are relatively much lower than this requested allocation.

Groundwater development is relatively low in this area. Limited groundwater data shows general stability from measurements in one nearby well, MARI 50649. The unconfined alluvial aquifer system is highly transmissive due to thick water-bearing deposits of coarse gravel (cobbles to boulders) and sand and the efficient hydraulic connection to the North Santiam River (Conlon and others, 2005; Gannett and Caldwell, 1998). Due to the strong connection to the river, much water pumped by the proposed POAs would likely originate from the river, particularly during high streamflow conditions that exist during the wet season period that corresponds to this application's proposed period of use (October through May). **These factors, particularly the period of use that would not conflict with dry season irrigation pumping, would greatly mitigate potential injury to other users.**

Despite the apparently low potential for injury to existing authorized groundwater users, the listed permit conditions are recommended to help manage and protect the groundwater resource.

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 ("Well 1")	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 ("Greenhouse Well")	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 ("Well 2")	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 ("Shop Well")	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: All four wells are shallow (<50 ft), there are no appreciable deposits of confining material, and static groundwater levels are approximately coincident with the uppermost water-bearing deposits. All of these factors indicated unconfined aquifer conditions.

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 ("Well 1")	1	North Santiam River	260-280	250-290	1560	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 ("Greenhouse Well")	1	North Santiam River	260-280	250-290	1500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 ("Well 2")	1	North Santiam River	260-280	250-290	700	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 ("Shop Well")	1	North Santiam River	260-280	250-290	2300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: All wells are shallow (<50 ft deep) and completed in an unconfined alluvial aquifer with groundwater levels that are generally consistent with the elevation of SW#1 within approximately one mile.

Water Availability Basin the well(s) are located within: WID 141: North Santiam River > Santiam 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 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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

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 ("Well 1")	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	MF141A	430	<input checked="" type="checkbox"/>	694	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
2 ("Greenhouse Well")	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
3 ("Well 2")	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MF141A	430	<input checked="" type="checkbox"/>	694	<input checked="" type="checkbox"/>	~13%	<input checked="" type="checkbox"/>
4 ("Shop Well")	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<<25%	<input type="checkbox"/>

Comments: C3a: not applicable (see discussion in Section B3 of this review)

C3b: As discussed in Section B3, although well-specific rates were not explicitly provided in the application, additional clarification provided by the applicant's agent (see attached e-mail) did indeed indicate that two of the four proposed POAs are intended to provide the majority of water. Thus, for this review it was assumed that either Wells 1 or 3 could at some future time potentially produce 10.07 cfs individually, particularly if either well were to be deepened in the future. With that assumption, both Wells 1 and 3 clearly trigger the "Qw>5 cfs" PSI criterion. However, even if this assumption is not realized in the future, i.e., if the 10.07 cfs is always roughly divided between the two wells as indicated by the applicant, other PSI criteria would still be triggered.

Also, for this analysis the 80% natural flow value (694 cfs) is the lowest monthly rate (October) corresponding to the proposed period of use, which is October through May. The ISWR rate of 430 cfs is the same for every month of the year.

The Hunt 1999 analytical stream depletion model was used to estimate 30-day interference at SW1 (North Santiam River) caused by pumping Well 3 (applicant's "Well 2") continuously at 10.07 cfs for 30 day. This most-conservative scenario resulted in an estimated 13% of interference at 30 days; other pumping scenarios will result in less estimated depletion.

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													
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 G-18739 file

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.

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.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

D. WELL CONSTRUCTION, OAR 690-200

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

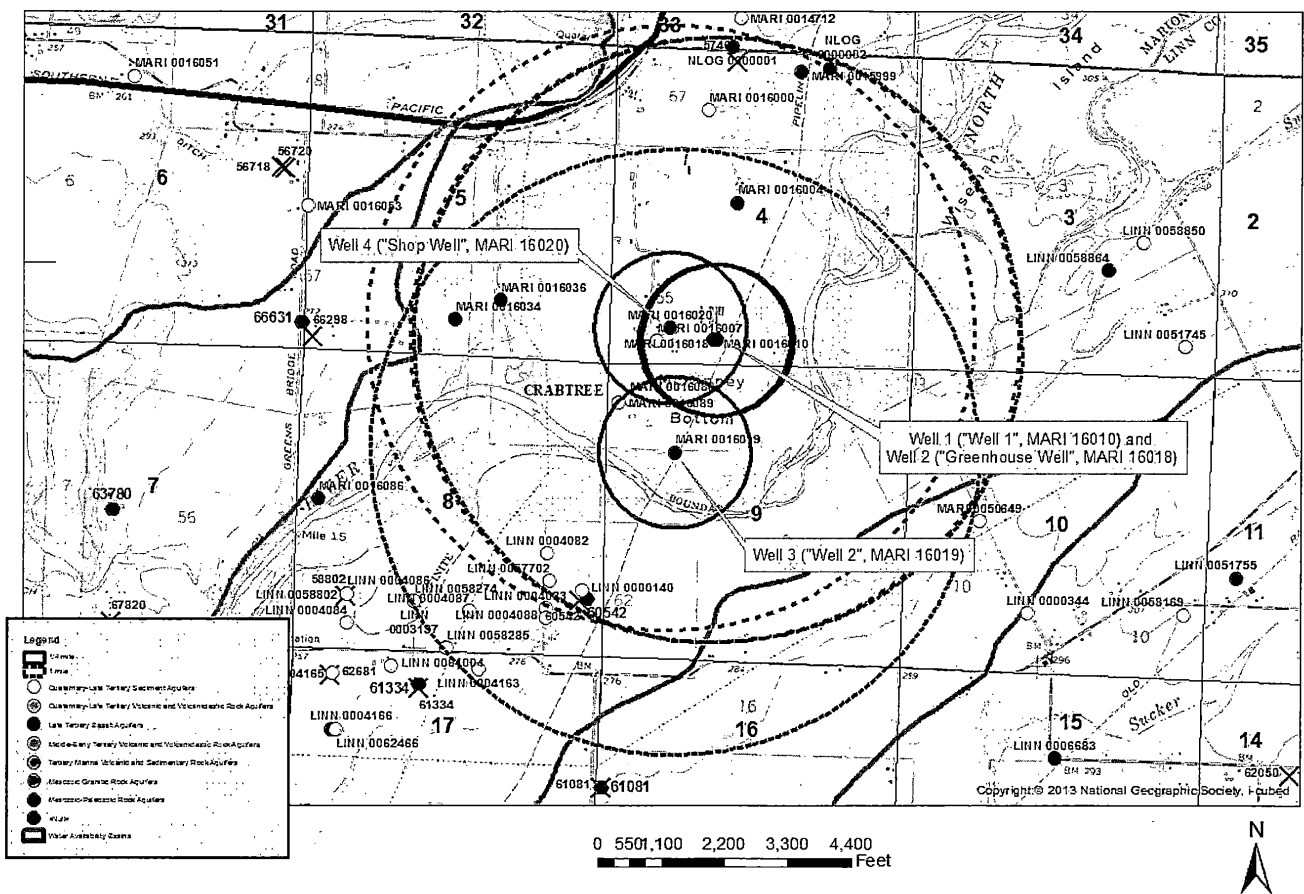
D2. **THE WELL does not appear to meet current well construction standards based upon:**
a. review of the well log;
b. field inspection by _____;
c. report of CWRE _____;
d. other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

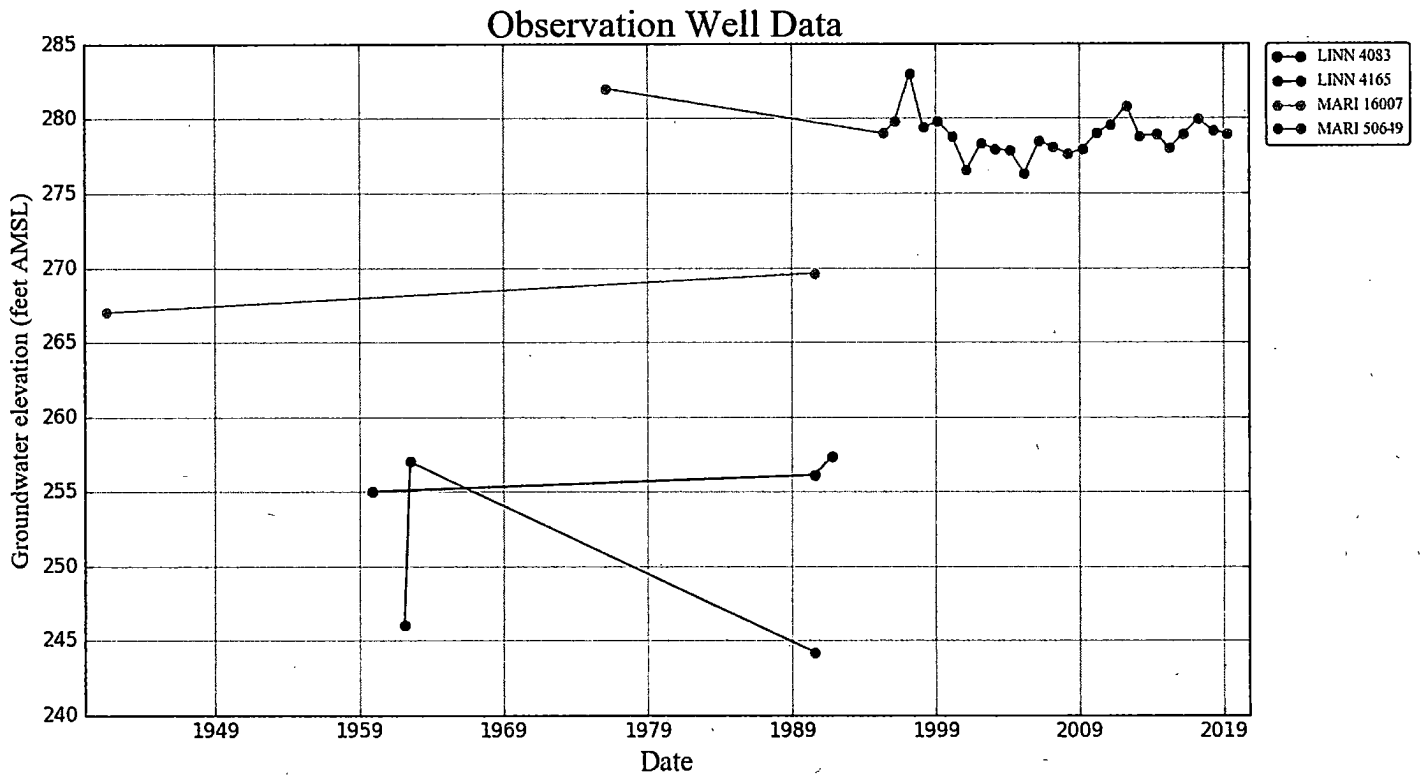
D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Well Location Map

Application G-18739 Weyerhaeuser NR Co.
T10S, R2W, Sections 4 & 9



Water-Level Trends in Nearby Wells



Water Availability Table

Oregon Water Resources Department Water Availability Analysis Main Help
Return Contact Us

Water Availability Analysis

Detailed Reports

N SANTIAM R - SANTIAM R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 5/22/2019

Watershed ID #: 141 (Back)
Date: 5/22/2019

Exceedance Level :88%
Time: 11:21 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	2,330.00	480.00	1,850.00	0.00	430.00	1,420.00
FEB	2,670.00	1,490.00	1,180.00	0.00	430.00	750.00
MAR	2,540.00	1,320.00	1,220.00	0.00	430.00	792.00
APR	2,500.00	1,480.00	1,020.00	0.00	430.00	590.00
MAY	2,550.00	802.00	1,750.00	0.00	430.00	1,320.00
JUN	1,500.00	434.00	1,070.00	0.00	430.00	636.00
JUL	858.00	331.00	527.00	0.00	430.00	97.30
AUG	661.00	317.00	344.00	0.00	430.00	-85.90
SEP	627.00	294.00	333.00	0.00	430.00	-97.50
OCT	694.00	264.00	430.00	0.00	430.00	-0.22
NOV	1,300.00	266.00	1,118.00	0.00	430.00	684.00
DEC	2,540.00	267.00	2,270.00	0.00	430.00	1,840.00
ANN	1,960,000.00	483,000.00	1,500,000.00	0.00	312,000.00	1,190,000.00

Copy of 5/20/2019 e-mail from Will McGill (CWRE) to Barbara Poage (OWRD)

From: Will McGill <wilmcgill.surveying@gmail.com>
Sent: Monday, May 20, 2019 10:22 AM
To: POAGE Barbara J * WRD <Barbara.J.Poage@oregon.gov>
Subject: Re: FW: App G-18739 - why so much water requested?

Hi Barbara,

The Weyerhaeuser (Turner) tree farm and nursery harvests seeds from the fir tree orchards on this farm and uses these seeds to start baby trees for reforestation. This is vital to sustaining our state's forests. The "Temperature Control" (TC) requested in application G-18739 is a very crucial component of this nursery tree farm operation to protect the baby trees from killing frosts October 1 through May 31. I have rechecked my calculations and Grant met with the farm managers last Friday to confirm their need for this quantity of water. This quantity of 10.07 cfs is needed because the entire 52.6 acres of planted beds needs to be irrigated all at the same time to protect all of the planted baby trees. Following are the reasons and calculations for total 10.07 cfs needed for the 52.6 acre TC:

- Average days with minimum temperature below freezing for Salem, OR area = 62 days (per climatezone.com). After discussing with Weyerhaeuser's farm managers, we settled on using 30 days to hold the requested amount to a minimum needed.
- It is needed to run all of the sprinklers at the same time for the full acreage during a frost event.

30' x 42' sprinkler spacing = 34.6 sprinklers/acre
34.6 sprinklers/acre * 2.5 gpm sprinklers = 86 gpm/acre
86 gpm/acre * 52.6 acres = 4,523.6 gpm / 449 gpm/cfs = 10.07 cfs

The water for TC comes from wells 1 and 2 which are connected by mainline and would supply water to the 52.6 acres for TC. Well 1 has a yield of 2,975 gpm and Well 2 has a yield of 2,770 gpm for a total of 5,745 gpm; exceeding the requested amount of 4,523.6 gpm (10.07 cfs). The reason the TC rates requested for the 3.0 acres and the 4.4 acres is less than the rate requested for the 52.6 acres is because there are existing TC rights on these two small acreages; however, the rate of this TC is deficient. The inclusion of these footprints in this application is to provide additional amount needed to equal the rate calculated for the 52.6 acres (86 gpm/acre). These areas will be served by the Greenhouse and Shop Wells.

Let me know if you have any questions.

Thanks,

Hunt 1999 Stream Depletion Analysis Results

PyHunt stream depletion analysis tool

Application type:	G
Application number:	18739
Well number:	3
Stream Number:	1
Pumping rate (cfs):	10.07
Pumping duration (days):	30
Pumping start month number (3=March)	10

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	700	700	700	ft
Aquifer transmissivity	T	5000	25000	50000	ft ² /day
Aquifer storativity	S	0.1	0.1	0.1	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Not used		10.0	20.0	30.0	
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Not used		0.2	0.2	0.2	
Stream width	ws	185	185	185	ft

Stream depletion for Scenario 2:

Days	10	120	150	180	210	240	270	300	330	360	30	60	90
Depletion (%)	7	3	3	2	2	2	2	1	1	1	13	6	4
Depletion (cfs)	0.67	0.32	0.26	0.22	0.20	0.17	0.16	0.14	0.13	0.12	1.33	0.58	0.41

