

Groundwater Application Review Summary Form

Application # G- 18923

GW Reviewer Travis Brown Date Review Completed: 6/1/2020

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 1, 2020

TO: Application G- 18923

FROM: **GW:** Travis Brown
(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 _____ 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: 6/1/2020
 FROM: Groundwater Section Travis Brown
 Reviewer's Name
 SUBJECT: Application G- 18923 Supersedes review of _____
 Date of Review(s) _____

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

ORAR 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 ORAR 690-310-140 to determine whether the presumption is established. ORAR 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: Stauffer Farms, Inc. County: MARION

A1. Applicant(s) seek(s) 1.56 cfs from 1 well(s) in the Willamette Basin,
Pudding-Molalla subbasin

A2. Proposed use Irrigation (124.5 acres; 311.25 af) Seasonality: March 1 – 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 ID	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	Well 5	Alluvium	1.56	4S/1W-35 NW-NW	App: 1030' S, 555' E fr NW cor S 35 ^a OWRD: 1060' S, 455' E fr NW cor S 35

* 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	~176 ^b	TBD	TBD	TBD	350	0-50	0-350 (12")	TBD	TBD	TBD	TBD	TBD

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is ~ 3/4 of a mile east of the city of Hubbard, Oregon.

^a There is a ~100 ft discrepancy between the POA location marked on the application map and that described in the metes-and-bounds coordinates using the Department PLSS projection. This review assumes that the location marked on the application map is the most accurate; metes-and-bounds coordinates for this location are provided in the table above. If the applicant chooses to revise the proposed metes-and-bounds coordinates to match the Department-projected coordinates, a re-review should not be required.

^b Ground surface elevation at location of proposed POA, estimated from LIDAR (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 more than 1/4 of a mile from the nearest surface water source. Per ORAR 690-502-0240, the relevant basin rules do not apply.

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: N/A

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:
- is over appropriated, is not over appropriated, or **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
 - will not** or **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
 - will not** or **will** likely to be available within the capacity of the groundwater resource; or
 - will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
 - The permit should contain condition #(s) 7n (annual water levels), large 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.
- Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
 - Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
 - Condition** to allow groundwater production only from the alluvial groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
 - Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

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

- B3. **Groundwater availability remarks:** Groundwater for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.

Because the applicant has not provided proposed perforated or screened intervals, the targeted water-bearing zone is uncertain. The proposed well depth (~350 ft below land surface [bls]) for the POA is deeper than other known wells in this area (see attached Well Statistics). Nearby wells indicate productive sand and gravel between ~50 to 80 ft mean sea level (msl) (~130 to 100 ft bls) and ~ -30 to -10 ft msl (~210 to 190 ft bls). Gannett and Caldwell (1998) estimated that predominantly fine-grained sediments (“Willamette Silt”) extended to ~100 ft bls (~70 ft msl), with 20-40 ft of coarser-grained sediments (“Willamette Aquifer”) below the Willamette Silt. Beneath the Willamette Aquifer, sediments are primarily fine-grained (“Willamette Confining Unit”), though intermittent beds of coarser sediments may occur. The bottom of the proposed POA, therefore, would extend into the Willamette Confining Unit of Gannett and Caldwell (1998), though the well may ultimately produce from coarse-grained sediments in either the Willamette Aquifer or the Willamette Confining Unit (or both) depending upon the perforated/screened intervals.

The proposed POA is ~160 ft from the nearest neighboring well, **MARI 1016**, an irrigation well claimed under **GR-751** for up to 0.557 cfs (~250 gpm). **GR-751** is registered to both Stauffer Farms, Inc. and CNR Farms, Inc. **MARI 1016** is reportedly perforated from 100-110 and 200-210 ft bls. Although the exact completion details, including perforated/screened intervals, for the proposed POA have not been provided, it is highly likely that the proposed POA would produce water from a similar zone as **MARI 1016**. To assess the potential interference with **MARI 1016** resulting from the proposed use, a Theis (1935) drawdown analysis was conducted. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2003, 2005; Iverson, 2002; McFarland and Morgan, 1996; Woodward et al., 1998) or are within a typical range of values for the given parameter within the hydrogeologic regime (Domenico and Mifflin, 1965; Freeze and Cherry, 1979; Halford and Kuniansky, 2002). Results of the analysis indicate that at the maximum proposed rate (1.56 cfs), interference with **MARI 1016** could likely exceed 25 ft within 1 day of continuous pumping (see attached Well Interference Analysis – Maximum Pumping). Under a more modest pumping scenario wherein the proposed POA is pumped

at the minimum rate (~0.64 cfs) necessary to achieve the proposed duty (311.25 af) within the proposed period of use (~245 days), results of the analysis still indicate that interference with MARI 1016 is likely to exceed 25 ft before the end of the irrigation season (see attached Well Interference Analysis – Average Pumping). Condition 7n (recommended for any permit issued pursuant to this application) stipulates that pumping must be curtailed if interference exceeds 25 ft in any neighboring well with senior priority. **Therefore, it is unlikely that the proposed use will be available in the amounts requested.**

At least 6 observation wells with useful data are within ~2 miles of the proposed POA, though none closer than 1 mile. Data from these wells indicate relative stability within the alluvial aquifer system over the past ~3 decades (see attached Hydrograph). While the proposed rate (1.56 cfs or ~700 gpm) is well above the median reported yield (~45 gpm) for water wells in the surrounding sections, it is within the range of reported yields (see attached Well Statistics). Therefore, it appears that the requested rate may be achievable within the capacity of the groundwater resource. However, the conditions specified in B1(d)(i) and B2(c), above, are strongly recommended for any permit issued pursuant to this application.

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

Basis for aquifer confinement evaluation: Potential water-bearing zones were noted in nearby logs at elevations of ~50 to 80 ft msl and ~ -30 to -10 ft msl. Significant thicknesses of fine-grained sediments are anticipated to overly both water-bearing zones. Estimated groundwater elevation in this area is ~120 to 140 ft msl (Woodward et al., 1998). Well completion statistics for nearby water wells indicate that the vast majority of water wells in this area reported initial static water levels above their applicable water-bearing zones (see attached Well Statistics). Based on the available evidence, the proposed aquifer is confined.

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 Pudding R	~120-140 ^a	~111-147 ^b	~3,170	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Brandy Creek	~120-140 ^a	~107-118 ^b	~4,270	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The estimated groundwater elevation is coincident with or above the estimated surface water elevation of perennial stream reaches of SW 1 and SW 2 within 1 mile of the proposed POA. The proposed POA will be hydraulically connected to SW 1 and SW 2.

^a From Woodward et al. (1998)

^b Within 1 mile of proposed POA; estimated from LIDAR (Watershed Sciences, 2009)

Water Availability Basin the well(s) are located within: WID #151, 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?	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 type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	<input type="checkbox"/>	67.3	<input checked="" type="checkbox"/>	<<25%	<input checked="" type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	<input type="checkbox"/>	67.3	<input checked="" type="checkbox"/>	<<25%	<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?
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Comments: The proposed rates of diversion (1.56 cfs) for the authorized POA exceed 1 percent (0.673 cfs) of the stream discharge which is equaled or exceeded 80 percent of time (67.3 cfs) for SW 1 & 2. Per OAR 690-009-0040(4)(c), the Potential for Substantial Interference (PSI) is assumed.

Interference with surface water was quantitatively assessed using the Hunt (2003) analytical model. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2003, 2005; Iverson, 2002; McFarland and Morgan, 1996; Woodward et al., 1998) or are within a typical range of values for the given parameter within the hydrogeologic regime (Domenico and Mifflin, 1965; Freeze and Cherry, 1979; Halford and Kuniansky, 2002). Results of the analysis indicate that interference with SW 1 and SW 2 is unlikely to exceed 25 percent of the rate of withdrawal within 30 days of continuous pumping (see attached Stream Depletion Analysis).

C4a. **690-09-040 (5):** Estimated impacts on hydraulically connected surface water sources greater than one mile as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: N/A

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:** **PSI is assumed per OAR 690-009-0040(4)(c). If the applicant reduces the proposed rate to 0.673 cfs or less, PSI will no longer be assumed. A re-review should not be required for such a change.**

References Used:

Application File: G-18923

Groundwater Claim: GR-751

Pumping Test Reports: CLAC 17196, 56004, 70439; MARI 490, 538, 543, 692, 723, 793, 884, 1017, 1488, 1717, 1728, 2011, 17630, 19191, 55251, 55994, 58399, 58546

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

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Groundwater hydrology of the Willamette Basin, Oregon, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

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

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

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

Halford, K.J., and Kuniansky, E.L., 2002, Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data, Open File Report 02-197, 51 p: U. S. Geological Survey, Reston, VA.

Herrera, N. B., Burns, E. R., Conlon, T. D., 2014, Simulation of groundwater flow and the interaction of groundwater and surface water in the Willamette Basin and Central Willamette Subbasin, Oregon, Scientific Investigations Report 2014-5136: U. S. Geological Survey, Reston, VA.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, Vol 8, p. 12-19.

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.

Kruseman, G.P., and de Ridder, N.A., 1990, Analysis and Evaluation of Pumping Test Data, Second Edition (Completely Revised): International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, 377 p.

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

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, American Geophysical Union Transactions, vol. 16, p. 519-524.

United States Geological Survey, 2014, National Hydrography Dataset (NHD), 1:24,000, U. S. Department of the Interior, Reston, VA.

United States Geological Survey, 2017, Woodburn quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, VA.

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

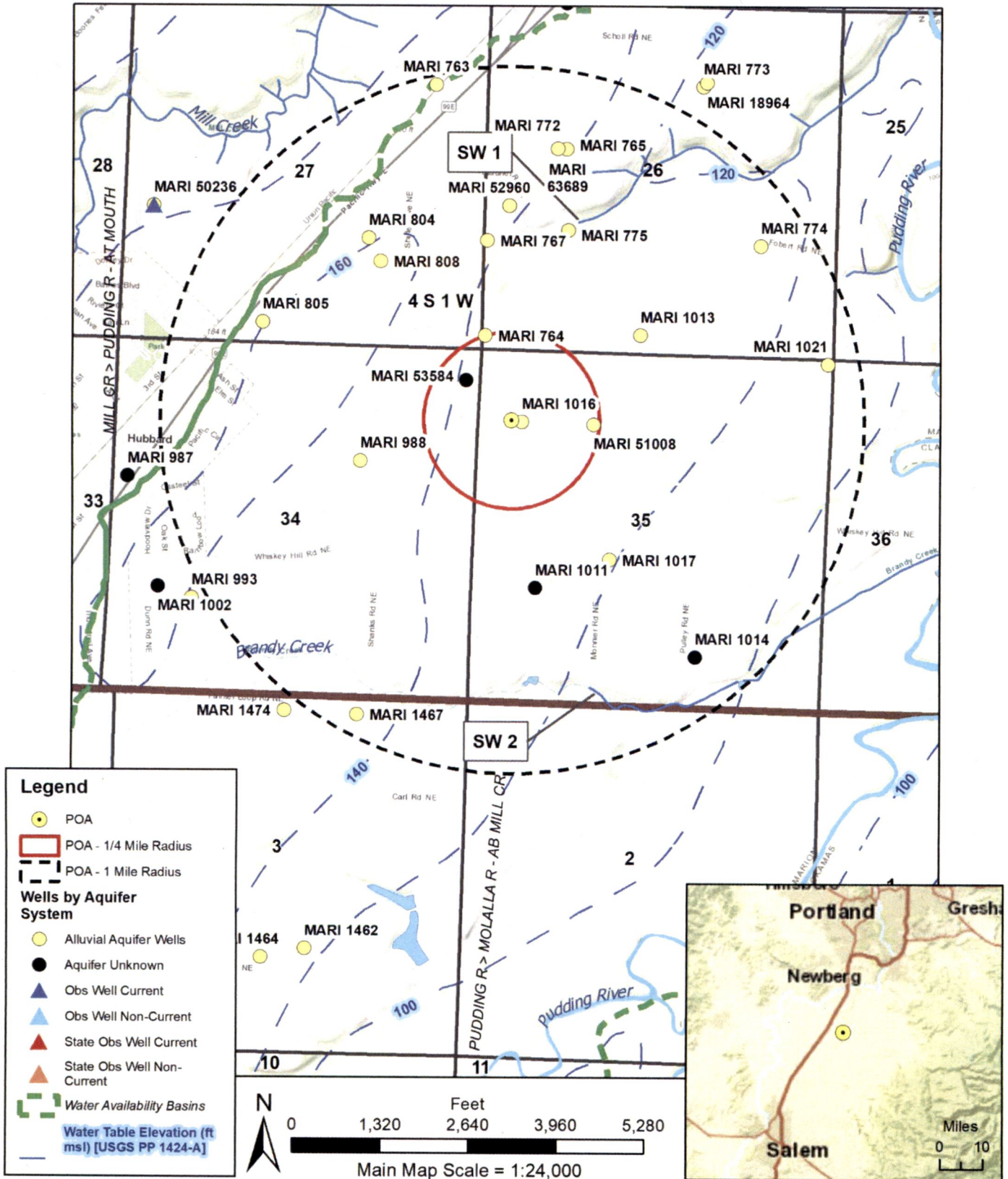
Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

D. WELL CONSTRUCTION, OAR 690-200

- 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.**

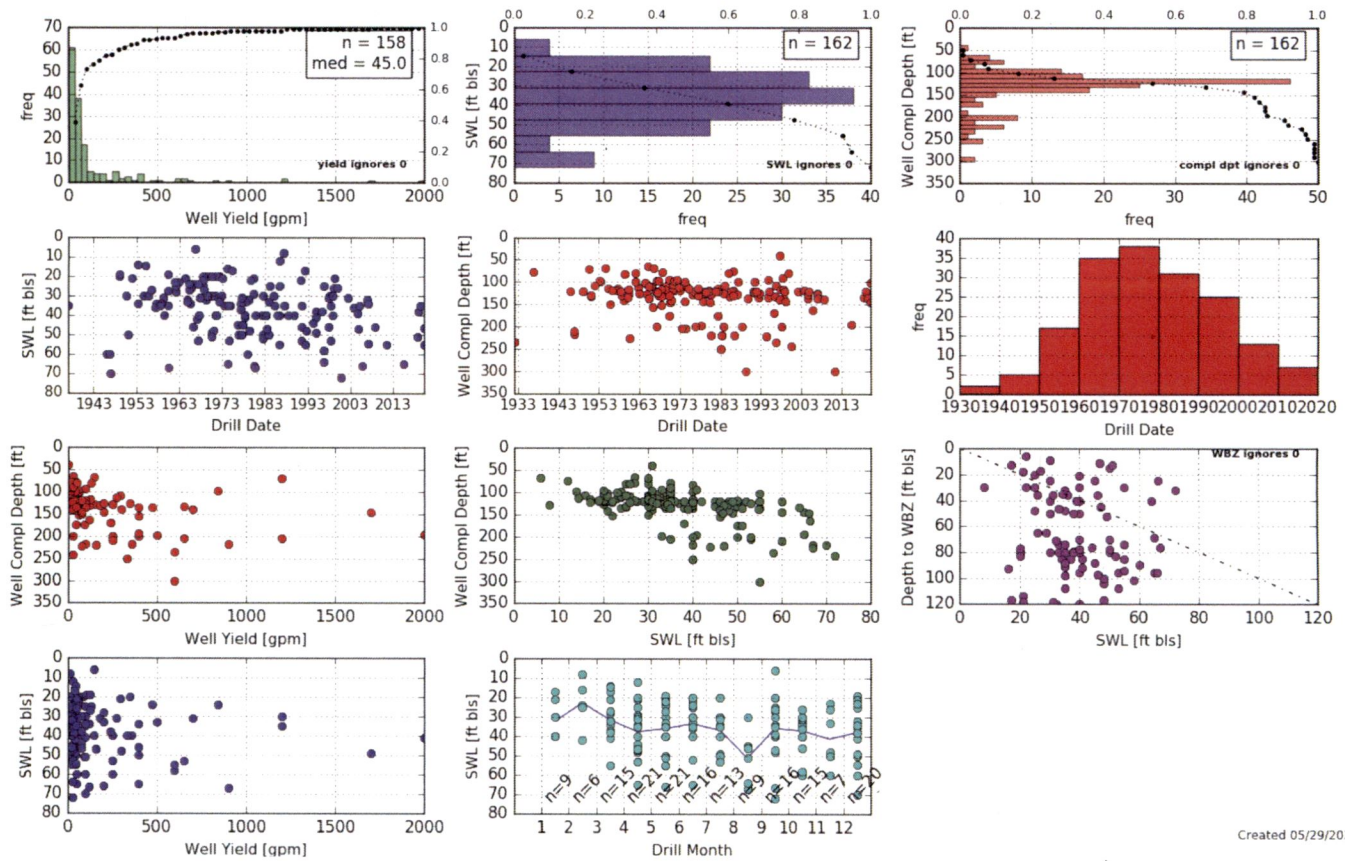
Well Location Map

G-18923 Stauffer Farms, Inc.



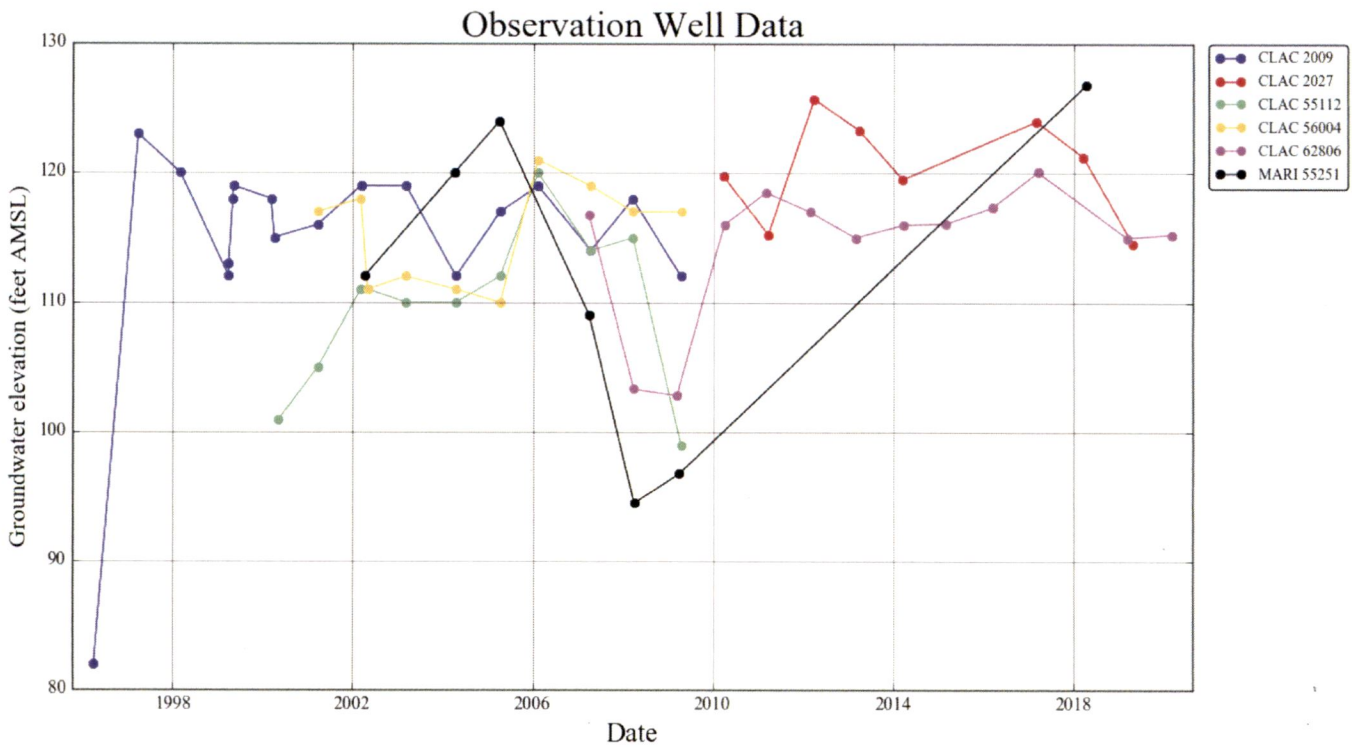
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
 Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Water Well Completion Statistics – T4S/R1W-S24, 25, 35, & 36



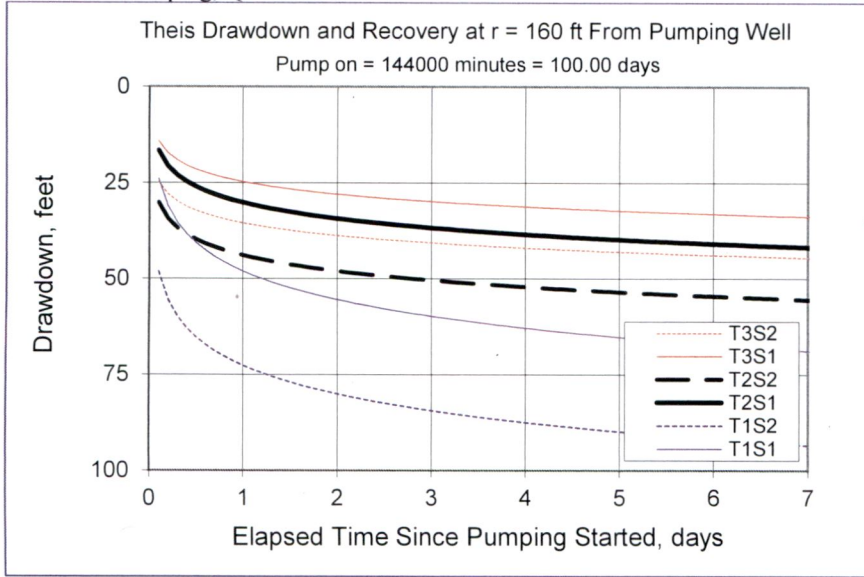
Created 05/29/2020

Hydrograph

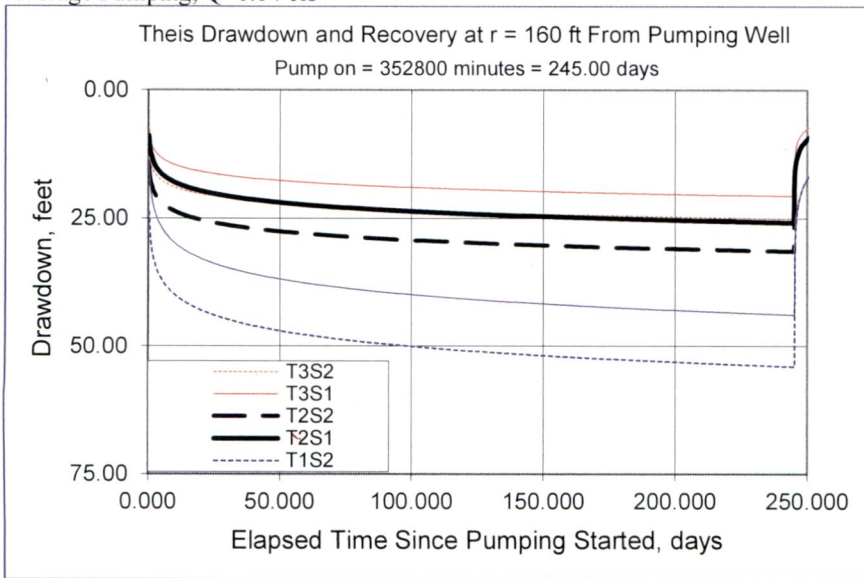


Well Interference Analysis (Theis, 1935)

Maximum Pumping, Q=1.56 cfs



Average Pumping, Q=0.64 cfs



Input Data:	Var Name	Max Q	Avg Q	Units
Pumping rate	Q	1.56	0.64	cfs
Total pumping time	t	100	245	d
Radial distance from pumped well:	r	160	160	ft
Transmissivity	T_1	1000	1000	ft ² /day
	T_2	1800	1800	ft ² /day
	T_3	2300	2300	ft ² /day
Aquifer thickness	b	40	40	ft
Storativity	S_1	0.001	0.001	[-]
	S_2	0.0001	0.0001	[-]

Water Availability Tables

Water Availability Analysis

Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN

Water Availability as of 5/26/2020

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

Exceedance Level:

Date: 5/26/2020

Time: 5:34 PM

Water Availability Calculation **Consumptive Uses and Storage** **Instream Flow Requirements** **Reservations**

Water Rights

Watershed Characteristics

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	1,040.00	125.00	915.00	0.00	36.00	879.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	76.10	934.00	0.00	36.00	898.00
APR	787.00	52.00	735.00	0.00	36.00	699.00
MAY	425.00	50.10	375.00	0.00	36.00	339.00
JUN	224.00	71.80	152.00	0.00	36.00	116.00
JUL	109.00	113.00	-3.93	0.00	36.00	-39.90
AUG	71.00	92.50	-21.50	0.00	36.00	-57.50
SEP	67.30	52.50	14.80	0.00	36.00	-21.20
OCT	91.60	11.20	80.40	0.00	36.00	44.40
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	55,800.00	650,000.00	0.00	26,100.00	626,000.00

Stream Depletion Analysis

Application type:	G
Application number:	18923
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.64
Pumping duration (days):	245

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3170	3170	3170	ft
Aquifer transmissivity	T	1000	1800	2300	ft ² /day
Aquifer storativity	S	0.001	0.0005	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	60	50	40	ft
Aquitard thickness below stream	babs	60	45	30	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-

Stream depletion for Scenario 2:

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

