

Groundwater Application Review Summary Form

Application # G- 18849

GW Reviewer Travis Brown Date Review Completed: 8/16/2019

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.

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

August 16, 20 19

TO: Application G- 18849

FROM: GW: Travis Brown (Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

[] YES The source of appropriation is within or above a Scenic Waterway

[x] NO

[] YES Use the Scenic Waterway condition (Condition 7J)

[x] 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.

Table with 12 columns (Jan-Dec) and 2 rows (headers and empty cells).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section
 FROM: Groundwater Section Travis Brown Date 8/16/2019
 SUBJECT: Application G- 18849 Reviewer's Name Travis Brown
 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: Zorn Farms, Inc. County: Marion

A1. Applicant(s) seek(s) 1.3256 cfs from 1 well(s) in the Willamette Basin,
Mainstem Willamette subbasin

A2. Proposed use Irrigation 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 #	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 51725	2	Alluvium	1.3256	4S/2W-4 SW-SE	605' S & 985' W fr NW cor DLC 70 ^a

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	~179	20	90	3/13/2014	347	0-40	+2-298 (16")	+3-299 (12") 339-347 (12")	299-339	800	138	Pump (6 hr)

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is ~3 miles northeast of the city of St. Paul, Oregon. Applicant proposes to irrigate up to 105.8 acres with a maximum annual volume of 264.5 af, based on the maximum allowed duty of 2.5 af/acre. The proposed POA (MARI 51725) is also an authorized POA for Nursery Use on 101 acres at a maximum rate of 1.78 cfs and maximum annual volume of 505 af under **Permit G-18143** (priority date May 12, 2004). The proposed POA will therefore be assessed at a total combined rate of 3.1056 cfs (~1,394 gpm) and maximum annual volume of 769.5 af.

^a There is a slight discrepancy (~7 ft) in the metes-and-bounds location description for the POA (MARI 51725) in this application and that in Permit G-18143.

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 greater than 1/4-mile from the nearest surface water source and will develop a confined aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin rules (OAR 690-502-0050) 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:

- 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 measurement), Large 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 alluvial groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

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

B3. **Groundwater availability remarks: 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.**

The proposed POA (MARI 51725) is reportedly completed to a depth of ~347 ft below land surface (bls). MARI 51725 produces water from sands and gravels between ~297-341 ft bls. The proposed POA produces water from the Willamette Confining Unit, which – despite its name – contains sufficient sand and gravel to produce relatively high yield wells in some areas (Gannett and Caldwell, 1998). In this area, the aquifer is ~275 ft thick and is overlain by ~100 ft of fine-grained Willamette Silt Unit, which acts as a leaky confining unit (Gannett and Caldwell, 1998). The regional water table resides in the Willamette Silt, generally within ~10 ft of land surface (Woodward et al., 1998). Recharge to the aquifer is primarily through the silt unit; water level data from MARI 1065 (an adjacent well to MARI 51725 completed to 178 ft) and MARI 51725 indicate a substantial (~0.4 ft/ft) downward hydraulic gradient in this area (see attached Hydrograph). Because the Willamette Confining Unit is confined, pumping impacts will propagate rapidly to aquifer boundaries: the Willamette River to the north and west, Mission Creek to the south, and the Willamette Silt elsewhere (via diffuse downward seepage over a large area).

The nearest known water well completed to a similar depth as the proposed POA is MARI 1054, authorized POA under **Permit G-15572** (priority date August 15, 2001). MARI 1054 is ~2,020 ft north of the proposed POA and reportedly completed to a depth of ~299 ft bls. A Theis (1935) drawdown analysis was conducted to assess the potential well-to-well interference due to pumping of the proposed POA (MARI 51725) in the amounts requested. Hydraulic parameters used for the analyses 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 parameter within the hydrogeologic regime (Domenico and Mifflin, 1965; Freeze and Cherry, 1979). As previously discussed (see A4, above), MARI 51725 is also an authorized POA under Permit G-18143. **Permit G-18143** contains a condition stipulating that “[t]he water user shall discontinue use off, or reduce the rate or volume of withdrawal from, the well(s) if annual water level measurements reveal...[h]ydraulic interference leading to a decline of 25 or more feet in any neighboring well with senior priority.” It is anticipated that any permit issued pursuant to this application would contain the same or similar condition. The potential for injury to MARI 1054 was therefore evaluated based on the likelihood of well-to-well interference exceeding 25 ft in MARI 1054 due to pumping of the proposed POA. To be conservative, it was assumed that the proposed POA (MARI 1054) would

pump continuously at its maximum combined (authorized plus proposed) rate of 3.1056 cfs (~1,394 gpm) up to its maximum annual volume of 769.5 af, which should take ~125 days. Results of the Theis (1935) analysis indicate that, at the maximum combined rate, total well-to-well interference with MARI 1054 is likely to exceed ~68 ft of drawdown after 125 days of pumping and to exceed 25 ft of drawdown after only ~4 days (see Theis Drawdown Analysis, attached). **Therefore, groundwater for the proposed use will most likely not be available in the amounts requested without injury to prior water rights or exceedance of the conditions of Permit G-15572.**

Water levels from nearby wells completed in the deeper (greater than 250 ft bls) confined aquifer indicate modest (5-20 ft) declines over the past two decades (see Hydrograph, attached).

The requested rate under this application (1.3256 cfs [595 gpm]) is equal to ~74 percent of the well yield noted on the log for MARI 51725 (800 gpm [~1.78 cfs] with 138 ft of drawdown per a 6 hr pumping test). Based on the most recent static water level (90 ft bls as of 3/13/2014), there is ~250 ft of available drawdown in MARI 51725, so there would seem to be the capacity for a higher pumping rate than noted on the well log for MARI 51725. However, the combined rate of 3.1056 cfs (1.3256 proposed in this application plus 1.78 cfs authorized under Permit G-18143) is ~74 percent more than the yield reported on the log for MARI 51725. Furthermore, the combined rate is ~387 percent of the median and ~139 percent of the maximum reported yield for wells in Section 4 completed to similar depths (see Well Statistics, attached). **As such, it is unlikely that the groundwater resource can sustain the proposed use in the amounts requested.**

Due to the high requested rate and large seasonal fluctuations in groundwater level observed in nearby observation wells, the water use and reporting conditions specified in B(1)(d), above, are 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 (Willamette Confining Unit)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Nearby well logs note static water levels above water-bearing zones, indicating that the 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 Willamette River	~90	97-110	~3,900 ^a	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Mission Creek	~90	108-120	~2,900	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The elevation of groundwater in the proposed POA and nearby observation wells with comparable construction is similar to the elevation of nearby surface water (see Hydrograph, attached). Groundwater surface mapping in this area indicates that groundwater is generally flowing toward and discharging into the small streams (particularly SW 2) which drain the terrace above the modern Willamette River floodplain (Gannett and Caldwell, 1998).

^a Distance to estimated point of hydraulic connection (based on surface and groundwater elevations).

Water Availability Basin the well(s) are located within: SW 1: WILLAMETTE R > COLUMBIA R – AB MOLALLA R
SW 2: CHAMPOEG CR > WILLAMETTE R – 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?
1	1	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	3,830	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	1.00	<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?
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: C3a: The combined (authorized plus proposed) rate of appropriation (3.1056 cfs) is greater than 1 percent (0.01 cfs) of the natural flow that is equaled or exceeded 80 percent of time (1.00 cfs) for the CHAMPOEG CR > WILLAMETTE R – AT MOUTH Water Availability Basin (WAB) (see Water Availability Tables, attached). Per OAR 690-09-0040(c), PSI with SW 2 is assumed.

Potential depletion of SW 1 and 2 due to pumping of the proposed POA was estimated using the Hunt 2003 analytical model. Hydraulic parameters used for the model were derived from regional data or studies of the hydrogeologic regime (Pumping Test Reports, OWRD Well Log Query Report, 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 parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Domenico and Mifflin, 1965). See attached Stream Depletion Analyses for the specific parameters used in the analyses.

Based on the preponderance of evidence, the Hunt 2003 analytical model results indicate that depletion of (interference with) SW 1 and 2 due to pumping of the proposed POA is anticipated to be much less than 25 percent of the well discharge at 30 days of continuous pumping.

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													
(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: Although the confined aquifer system tapped by the proposed POA is in efficient hydraulic connection with the Willamette River (~7,075 ft north of the proposed POA), the requested combined rate of withdrawal (3.1056 cfs) is less than 1 percent (38.3 cfs) of the natural streamflow that is equaled or exceeded 80 percent of time (3,830 cfs) and 1 percent (15 cfs) of the applicable minimum instream flow (1,500 cfs; Application MF-182). Therefore, the proposed use is not likely to cause PSI with the Willamette River.

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 with SW 2 (Mission Creek) is assumed based on the combined rate of appropriation. Permit G-18143 was not evaluated for PSI with Mission Creek based on the natural flow in CHAMPOEG CR > WILLAMETTE R - AT MOUTH WAB. Because the authorized rate of appropriation (1.78 cfs) associated with Permit G-18143 is in excess of 1 percent (0.01 cfs) of the flow that is equaled or exceeded 80 percent of time (1.00 cfs) for the CHAMPOEG CR > WILLAMETTE R - AT MOUTH WAB, any additional proposed rate of withdrawal for the proposed POA (MARI 51725) would be assumed to cause PSI with SW 2 (Mission Creek).**

References Used:

Application File: G-18849, G-16246

Permit: G-18143

Pumping Test Reports: MARI 1050, 1052, 1068, 51725

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.

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.

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.

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

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

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

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries: Portland, OR, May 27.

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 _____;

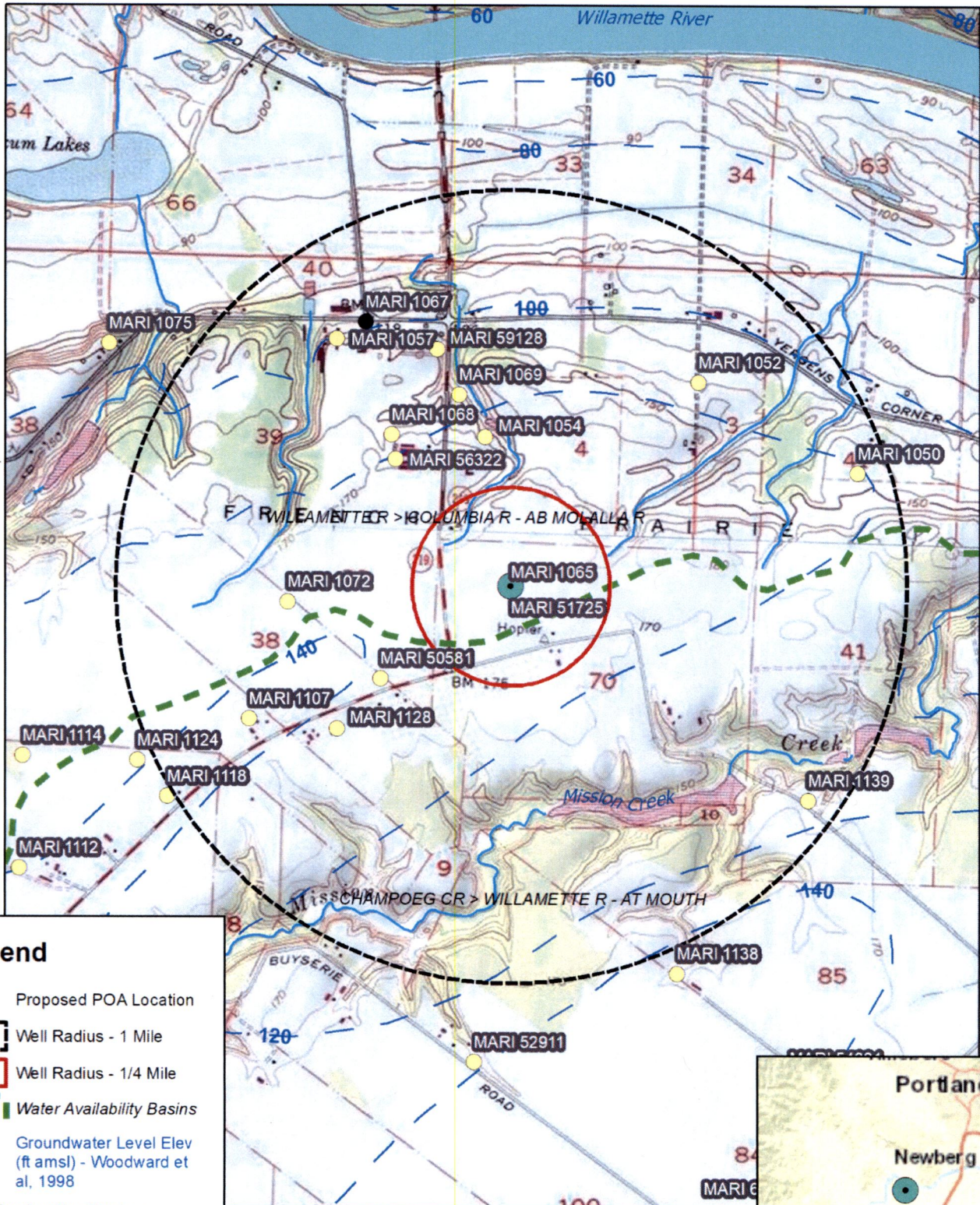
d. other: (specify) _____

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-18849 - Zorn Farms Inc.

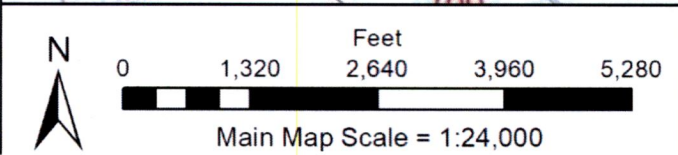


Legend

- Proposed POA Location
- Well Radius - 1 Mile
- Well Radius - 1/4 Mile
- Water Availability Basins
- Groundwater Level Elev (ft amsl) - Woodward et al, 1998

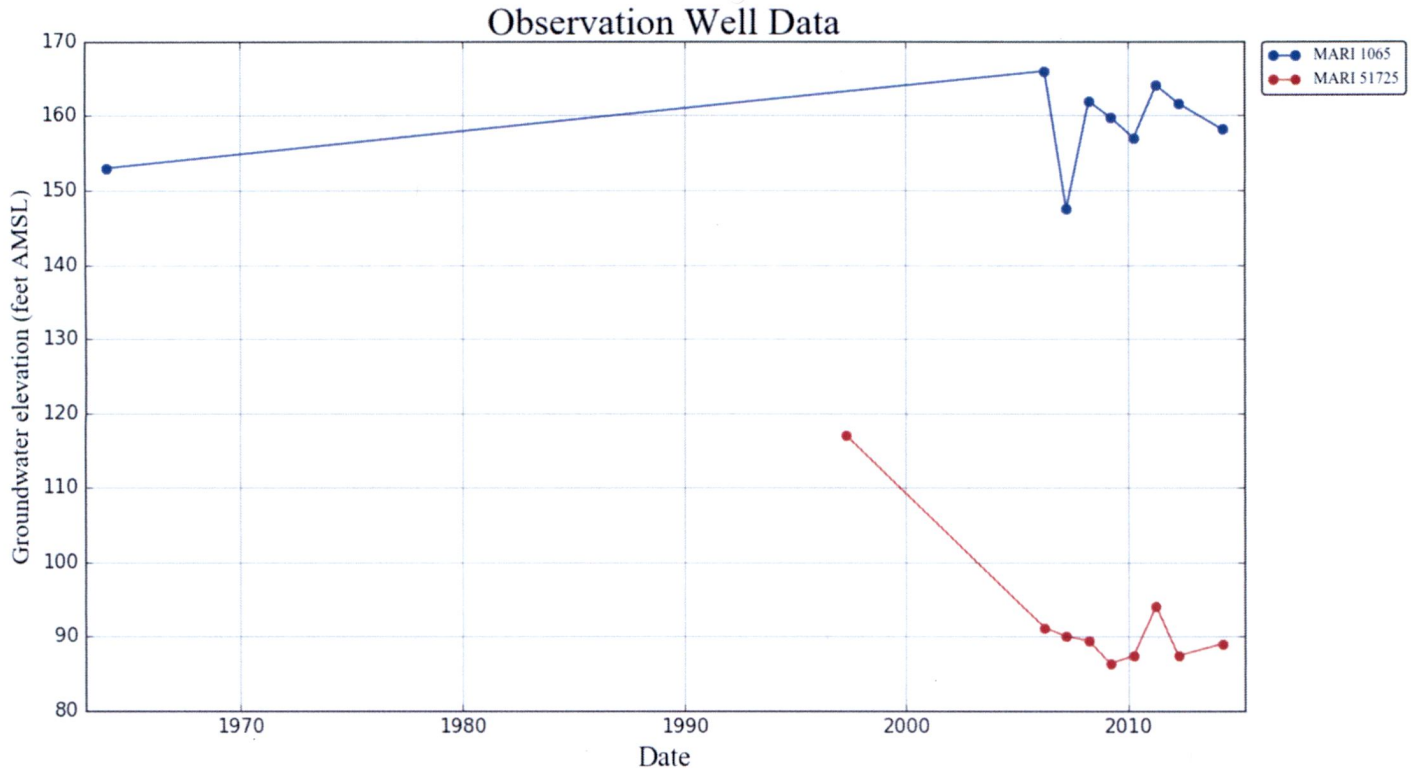
Wells by Aquifer System

- Quaternary-Late Tertiary Sediment Aquifers
- Unknown

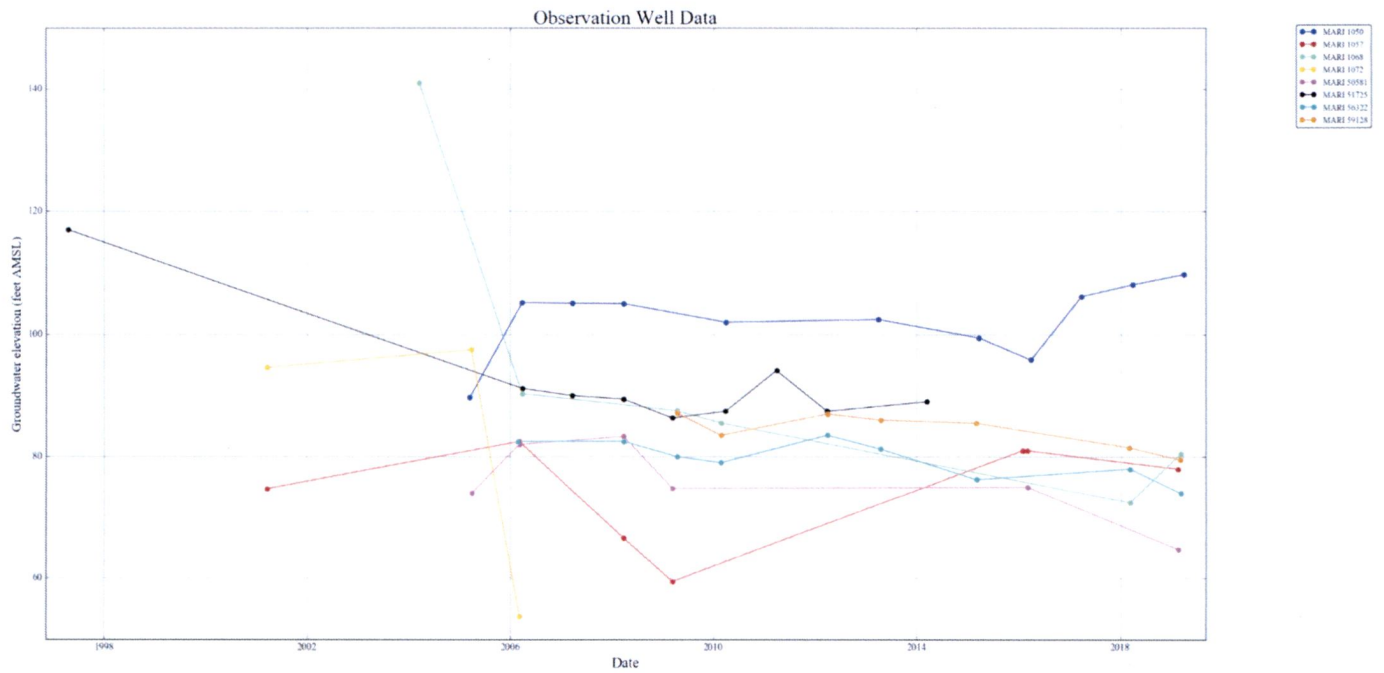


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 Copyright © 2013 National Geographic Society, i-cubed

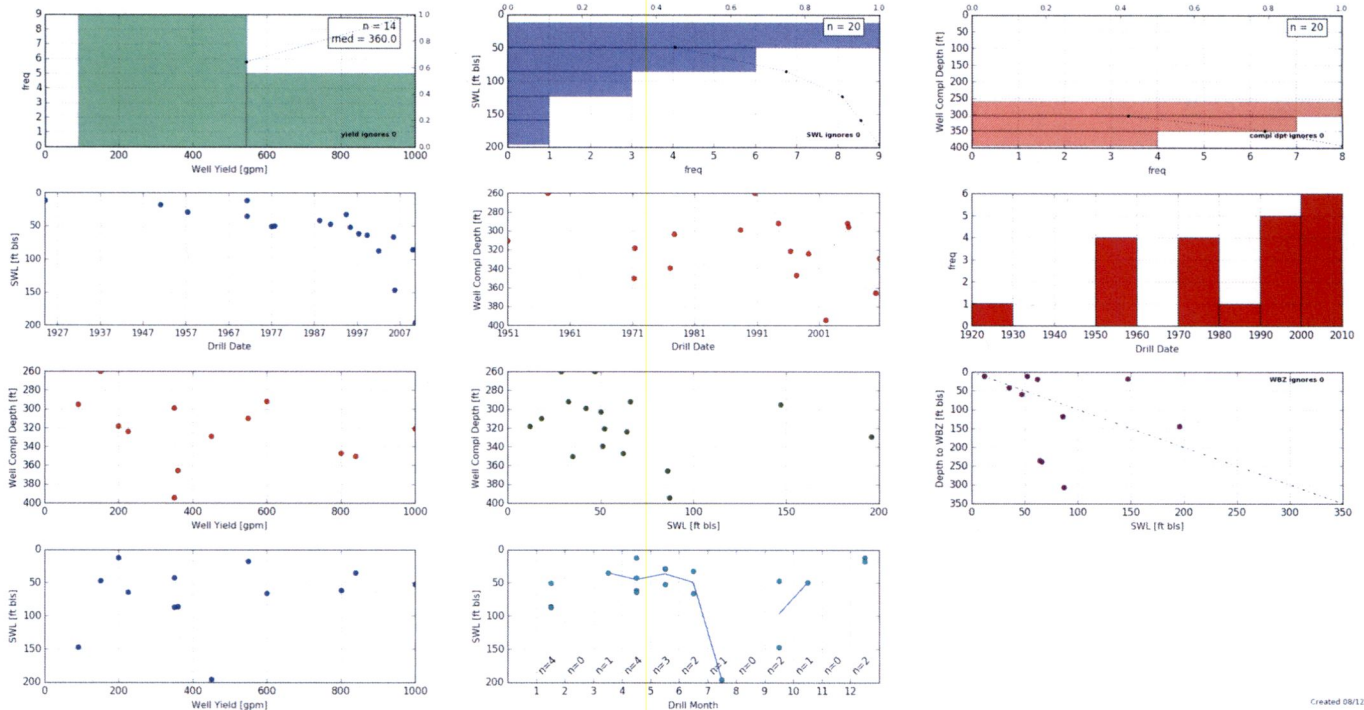
Hydrograph – MARI 1065 (TD = 178 ft) and MARI 51725 (TD = 347 ft)



Hydrograph – Spring Water Levels – Wells Greater Than 250 ft Total Depth



Well Statistics – 4S/2W-4 – Greater Than 250 ft Total Depth



Created 08/13/2019

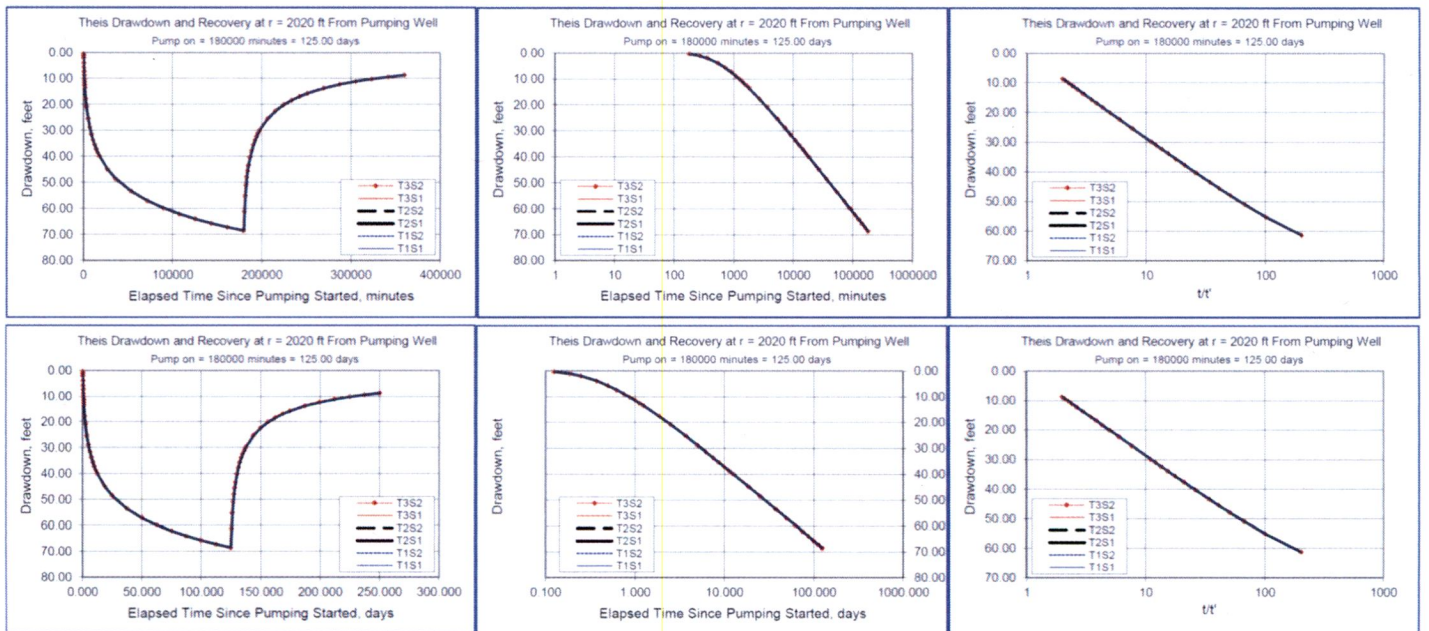
Thisis Drawdown Analysis

Thisis Time-Drawdown Worksheet v 3.00

Calculates Thisis nonequilibrium drawdown and recovery at any arbitrary radial distance, r, from a pumping well for 3 different T values and radial distance, r, from a pumping well for 3 different T values and 2 different S values.
Written by Karl C. Wozniak September 1992 Last modified December 30, 2014

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units
Total pumping time	t		125		d
Radial distance from pumped well:	r		2020.00		ft
Pumping rate	Q		1394.0		gpm
Hydraulic conductivity	K	56.667	56.667	56.667	ft/day
Aquifer thickness	b		30		ft
Storativity	S 1	0.00050			288.363.84 cfd
	S 2	0.00050			6.16 afd
Transmissivity Conversions	T_ftpd	1.700	1.700	1.700	ft ² /day
	T_ft2pm	1.1806	1.1806	1.1806	ft ² /min
	T_gpdft	12.716	12.716	12.716	gpd/ft

Use the Recalculate button if recalculation is set to manual



Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Water Availability as of 3/11/2005 for

CHAMPOEG CR > WILLAMETTE R - AT MOUTH

Watershed ID #: 30200708

Basin: WILLAMETTE

Exceedance Level: 80

Time: 08:37

Date: 03/11/2005

Month	Natural Stream Flow	CU + Stor Prior to 1/1/93	CU + Stor After 1/1/93	Expected Stream Flow	Reserved Stream Flow	Instream Water Rights	Net Water Available
1	37.30	6.59	0.00	30.70	0.00	0.00	30.70
2	51.70	6.11	0.00	45.60	0.00	0.00	45.60
3	22.40	3.06	0.00	19.30	0.00	0.00	19.30
4	10.90	1.88	0.00	9.02	0.00	0.00	9.02
5	6.15	3.87	0.00	2.28	0.00	0.00	2.28
6	3.04	6.45	0.00	-3.41	0.00	0.00	-3.41
7	2.94	10.60	0.00	-7.65	0.00	0.00	-7.65
8	1.88	8.41	0.00	-6.53	0.00	0.00	-6.53
9	1.08	4.11	0.00	-3.03	0.00	0.00	-3.03
10	1.00	0.30	0.00	0.70	0.00	0.00	0.70
11	10.10	3.74	0.00	6.36	0.00	0.00	6.36
12	47.80	9.46	0.00	38.30	0.00	0.00	38.30
Stor	28100	3910	0	25100	0	0	25100

**Water Availability Analysis
Detailed Reports**

WILLAMETTE R > COLUMBIA R - AB MOLALLA R
WILLAMETTE BASIN

Water Availability as of 8/15/2019

Watershed ID #: 182 (Map)

Exceedance Level: 80%

Date: 8/15/2019

Time: 3:51 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	21,400.00	2,300.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,480.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,250.00	15,100.00	0.00	1,500.00	13,600.00
APR	19,900.00	6,910.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,250.00	12,300.00	0.00	1,500.00	10,800.00
JUN	8,740.00	1,980.00	6,760.00	0.00	1,500.00	5,260.00
JUL	4,980.00	1,810.00	3,170.00	0.00	1,500.00	1,670.00
AUG	3,830.00	1,650.00	2,180.00	0.00	1,500.00	677.00
SEP	3,890.00	1,400.00	2,490.00	0.00	1,500.00	992.00
OCT	4,850.00	753.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	886.00	9,310.00	0.00	1,500.00	7,810.00
DEC	19,300.00	967.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000.00	2,250,000.00	13,000,000.00	0.00	1,090,000.00	11,900,000.00

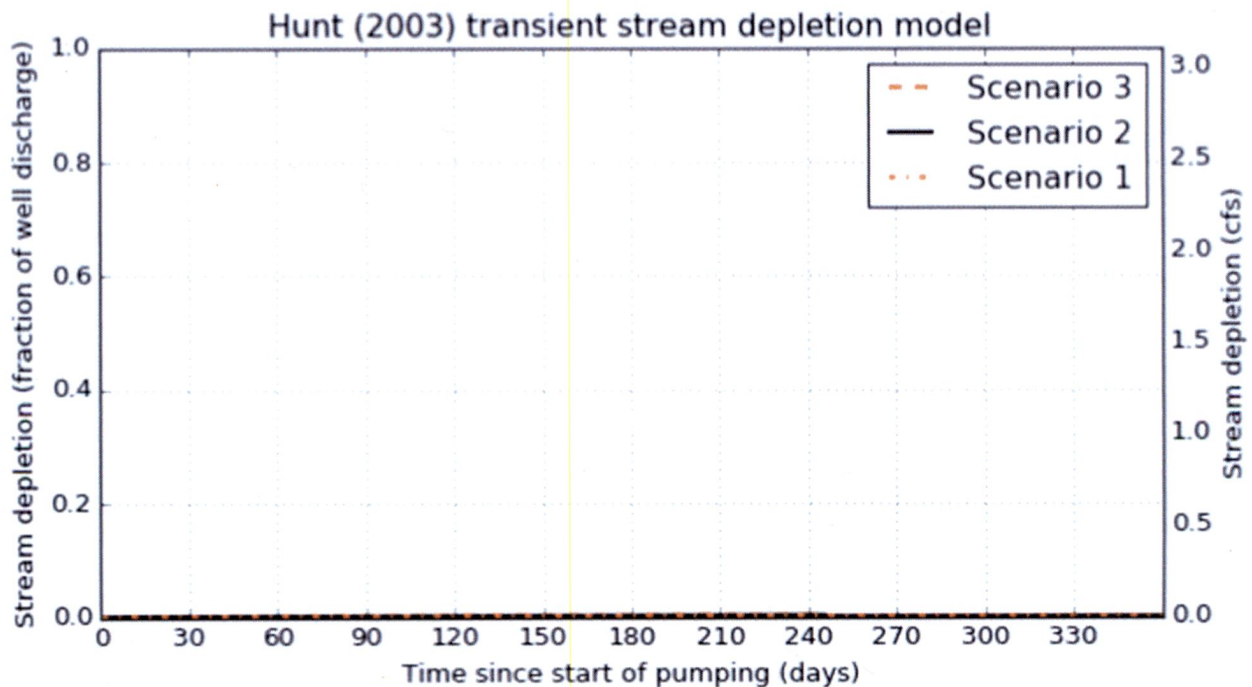
Stream Depletion Analysis – SW 1 (Unnamed Tributary to Willamette River)

Application type:	G
Application number:	18849
Well number:	1
Stream Number:	1
Pumping rate (cfs):	3.1056
Pumping duration (days):	245.0
Pumping start month number (3= March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3900.0	3900.0	3900.0	ft
Aquifer transmissivity	T	840.0	1700.0	2500.0	ft ² /day
Aquifer storativity	S	0.0005	0.0005	0.0005	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.01	0.01	ft/day
Aquitard saturated thickness	ba	30.0	30.0	30.0	ft
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	5.0	5.0	5.0	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00



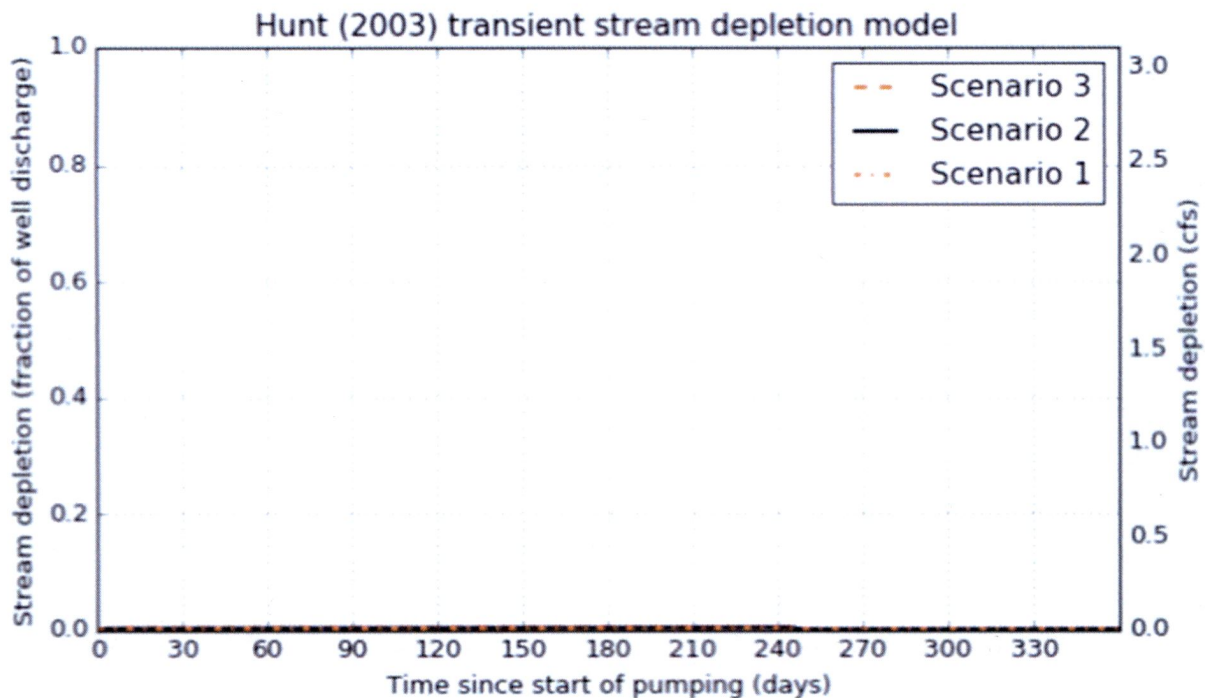
Stream Depletion Analysis – SW 2 (Mission Creek)

Application type:	G
Application number:	18849
Well number:	1
Stream Number:	2
Pumping rate (cfs):	3.1056
Pumping duration (days):	245.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2900.0	2900.0	2900.0	ft
Aquifer transmissivity	T	840.0	1700.0	2500.0	ft ² /day
Aquifer storativity	S	0.0005	0.0005	0.0005	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.01	0.01	ft/day
Aquitard saturated thickness	ba	30.0	30.0	30.0	ft
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	5.0	5.0	5.0	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00





MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18849
Date: December 10, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Travis Brown reviewed the application. Please see Travis's review and the well log.

Applicant's Well #2 (MARI 51725) Based on a review of the Well Report, Applicant's Well #2 seems to protect the groundwater resource.

The construction of Applicant's Well #2 may not satisfy hydraulic connection issues.

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

APR 25 1997

WELL: D.# _____ TO2416

WATER RESOURCES DEPT.

(START CARD) # 78623

Instructions for completing this report are on the last page of this form.

(1) OWNER: Well Number _____
Name Ernst Nursery & Farms
Address 20863 Riverside Dr. NE
City St. Paul State OR Zip 97137

(2) TYPE OF WORK
 New Well Deepening Alteration (repair/recondition) Abandonment

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable Auger
 Other _____

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other _____

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes No Depth of Completed Well 347 ft.
Explosives used Yes No Type _____ Amount _____

HOLE		SEAL		Material		Sacks or pounds	
Diameter	From To	From	To	From	To	From	To
20"	0 40'	holeplug	0 40'	0	40	40	sacks
		bentonite					
16"	40 347'						

How was seal placed: Method A B C D E
 Other QAR 690-210-340

Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 16"	+2'	298'	375'	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) 298'

(7) PERFORATIONS/SCREENS:

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
+3	299'			12"	pipe	<input checked="" type="checkbox"/>	<input type="checkbox"/>
299	319	.070		12"	screen	<input type="checkbox"/>	<input type="checkbox"/>
319	339	.080		12"	screen	<input type="checkbox"/>	<input type="checkbox"/>
339	347'			12"	pipe	<input checked="" type="checkbox"/>	<input type="checkbox"/>
347	Bottom				plate & lift bail	<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem at	Time
800	138		6 hr. S

Temperature of water 54 Depth Artesian Flow Found _____
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
Depth of strata: _____

(9) LOCATION OF WELL by legal description:
County Marion Latitude _____ Longitude _____
Township 4 S N or S Range 2W E or W. WM. _____
Section 4 SW 1/4 NE 1/4
Tax Lot 0110 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 6177 Gearin Rd.
St. Paul, OR 97137

(10) STATIC WATER LEVEL:
62' ft. below land surface. Date 4/17/97
Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
Depth at which water was first found 20'

From	To	Estimated Flow Rate	SWL
20	32	20 gpm	8'
297'	341'	800 gpm	62'

(12) WELL LOG:
Ground Elevation _____

Material	From	To	SWL
Topsoil	0	1	
Clay brown	1	36	
Clay gray brown	36	46	
Clay silty gray	46	75	
Sand-silt	75	87	
Clay gray	87	115	
Sand & clay gray	115	126	
Clay gray	126	144	
Clay with sand & gravel	144	175	
Clay gray	175	212	
Clay w/sand	212	224	
Clay gray, part sticky	224	276	
Clay w/sand, gravel gray	276	281	
Clay sandy, brown-gray	281	292	
Clay silty brown	292	297	
Sand brown	297	304	62'
Sand black	304	315	62'
Gravel & sand, black	315	341	62'
Clay gray	341	347	

Date started 12/24/96 Completed 4/17/97

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

Signed Kermit Martin WWC Number 1391 Date 4/23/97

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

Signed Ivan Gossen WWC Number 783 Date 4/21/97