

Groundwater Application Review Summary Form

Application # G- 18860

GW Reviewer Travis Brown Date Review Completed: 1/3/2020

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.

✓
1/15/20

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section
 FROM: Groundwater Section Travis Brown Date 1/3/2020
 Reviewer's Name
 SUBJECT: Application G- 18860 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: Oregon Department of Transportation County: MARION

A1. Applicant(s) seek(s) 0.15 cfs from 2 well(s) in the Willamette Basin,
Santiam River – Calapooia River subbasin

A2. Proposed use Irrigation (7.2 acres) / Commercial Seasonality: May 1- September 30 / Year-round

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	MARI 15381	SRA Well 1 SB	Alluvium	0.15	9S/3W-33 SE-SE	App: 790' N, 570' W fr SE cor S 33 ^a OWRD: 805' N, 490' W fr SE cor S 33
2	MARI 15382	SRA Well 2 NB	Alluvium	0.15	App: 9S/3W-33 SE-SE ^a OWRD: 9S/3W-34 SW-SW	App: 800' N, 5' W fr SE cor S 33 ^a OWRD: 800' N, 75' E fr SE cor S 33

* 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												
2												

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are ~2.3 miles northwest of the city of Jefferson, Oregon. The proposed annual volume is 18 af/year for Irrigation Use and 14.5 af/year for Commercial Use.

^a There appear to be discrepancies in the locations given for the proposed POA. The proposed POA locations marked on the Application Map are ~80 ft away from the metes-and-bounds-described locations using the Department PLSS projection. For proposed POA 2, the location marked on the Application Map falls within a different PLSS section based on the Department PLSS projection. The discrepancies are noted in the table above. For purposes of this review, the proposed POA locations indicated on the Application Map are considered the most reliable. Should the applicant choose to correct the proposed POA location descriptions to correspond with the Department's PLSS projection, an additional review should not be required.

A5. **Provisions of the** Willamette / Santiam River- Calapooia River 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 are completed in unconfined alluvium within ¼-mile of the Santiam River; therefore, per OAR 690-502-0240, the groundwater reservoir is presumed to be in hydraulic connection with the Santiam River and shall be classified the same as the surface source. OAR 690-502-0110(b) specifies that the Santiam River is classified for domestic, livestock, irrigation, municipal, industrial, agricultural, commercial, power, mining, recreation, fish life, wildlife, pollution abatement, wetland enhancement and public instream uses from September 1 – June 30, and **only for domestic, commercial use for customarily domestic purposes not to exceed 0.01 cfs**, livestock and public instream uses **from July 1 – August 31. The proposed Irrigation Use would therefore not be allowable from July 1 – August 31. Likewise, the proposed Commercial Use of 0.15 cfs would not be allowable from July 1 – August 31.**

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 measurements), medium water use reporting ;
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
- b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
- c. **Condition** to allow groundwater production only from the unconfined 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:** The proposed POA are completed in the relatively modern alluvium on the north bank of the Santiam River (Helm and Leonard, 1977). Because of the unconfined nature of the aquifer and its close proximity to a major river, recharge is anticipated to be rapid and the water level in the aquifer is anticipated to be approximately coincident with the river stage. Known nearby groundwater uses are less than 1 cfs each. Therefore, groundwater is not anticipated to be over-appropriated at this location, nor is the proposed use likely to exceed the capacity of the resource.

The nearest-known groundwater user is **Certificate 39798***, approximately 465 ft east of proposed POA 2. Due to the relatively low proposed pumping rate for POA 2, the unconfined nature of the aquifer, and the close proximity of the Santiam River – which acts a recharge boundary – the proposed groundwater use is not anticipated to prevent **Certificate 39798*** or similarly-located water rights from appropriating water to which they are legally entitled.

The conditions specified in B(1)(d)(i) and B(2)(c) 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	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: Well logs for the proposed POA and nearby wells do not indicate fine-grained saturated sediments of sufficient thickness to constitute a confining layer. Additionally, the proximity of the proposed POA to the Santiam River means that the shallow, tapped water-bearing zones are expected to be exposed along the river banks and/or subcrop beneath the river bed. Based on the available evidence, the local aquifer is unconfined.

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	Santiam River	~191	~188	~630	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	1	Santiam River	~192	~188	~520	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	Morgan Creek	~191	~184-204	~2,550	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Morgan Creek	~192	~184-204	~2,510	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The proposed POA are completed within unconfined alluvium within ¼-mile of SW 1 (Santiam River); therefore, per OAR 690-009-0040(2) and (4)(a), the proposed POA are assumed to be hydraulically connected to and have the Potential for Substantial Interference (PSI) with SW 1 (Santiam River).

Reported groundwater elevations in the proposed POA are within the range of surface water elevations estimated for SW 2 (Morgan Creek), which flows through modern alluvial sediments similar to those in which the proposed POA are completed (Helm and Leonard, 1977). Based on the available evidence, the proposed POA are hydraulically connected to SW 2 (Morgan Creek).

Water Availability Basin the well(s) are located within: SANTIAM R > WILLAMETTE R – AT MOUTH (WID #167)

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 checked="" type="checkbox"/>	<input type="checkbox"/>	MF167	320	<input type="checkbox"/>	923	<input type="checkbox"/>	~10%	<input checked="" type="checkbox"/>
2	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MF167	320	<input type="checkbox"/>	923	<input type="checkbox"/>	~11%	<input checked="" type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	923	<input type="checkbox"/>	<1%	<input type="checkbox"/>
2	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	923	<input type="checkbox"/>	<1%	<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?
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: The proposed POA are completed within unconfined alluvium within ¼-mile of SW 1 (Santiam River); therefore, per OAR 690-009-0040(2) and (4)(a), the proposed POA are assumed to be hydraulically connected to and have the Potential for Substantial Interference (PSI) with SW 1 (Santiam River).

The Hunt (1999) analytical model was used to assess potential depletion of (interference with) nearby surface waters due to the proposed use. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports, Conlon et al., 2003, 2005; Helm and Leonard, 1977; 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 (Freeze and Cherry, 1979; Domenico and Mifflin, 1965).

Model results indicate that the proposed use is unlikely to cause depletion of (interference with) either SW 1 or SW 2 greater than 25 percent of the proposed pumping within the first 30 days of pumping (see attached Stream Depletion Analyses). However, stream depletion will increase with additional pumping over time.

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:**

References Used:

Application File: G-18860

Pumping Test Reports: LINN 4469, 4525, 4615, 4640, 4646, MARI 15443

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, Ground-water 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.

Helm, D. C., and Leonard, A. R., 1977, Ground-water resources of the Lower Santiam River Basin, Middle Willamette Valley, Oregon, Ground-water Report No. 25, State of Oregon Water Resources Department, Salem, OR.

Hunt, B., 1999, Unsteady Stream Depletion from Ground Water Pumping: Ground Water, January-February, Vol 37, p 98-102.

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, Albany 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, Willamette Valley Phase I, Oregon: Portland, OR, December 21.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

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

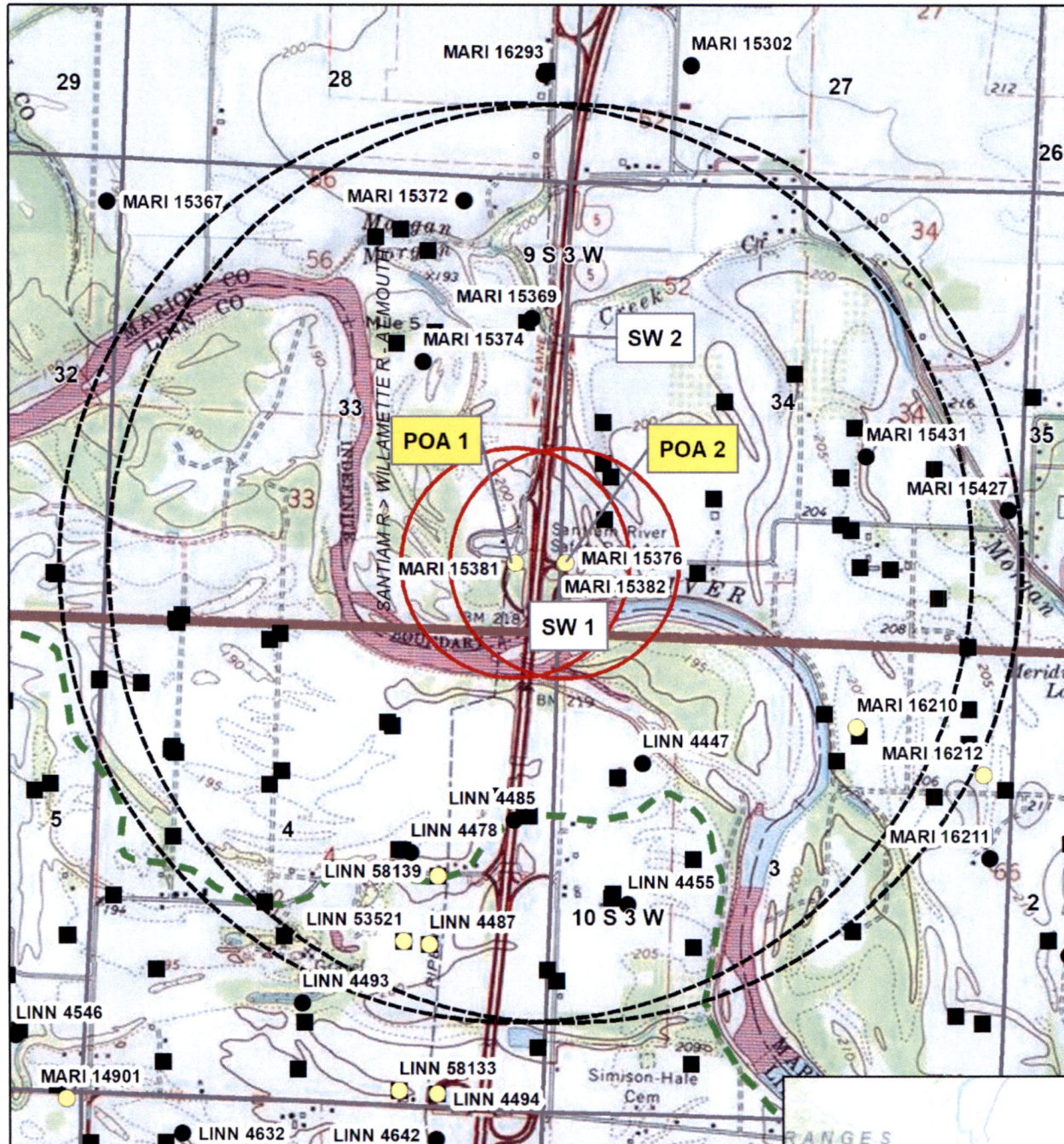
- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

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-18860 ODOT



Legend

Wells by Aquifer System

- Quaternary-Late Tertiary Sediment Aquifers
- Unknown
- POA_Qtrmi
- POA_1mi
- Groundwater Right
- Water Availability Basins

LLAMETTE R > O LUMBIA R - AB MILL CR AT GAGE 14191000

MARI 15114

LINN 4644

N

Feet

0 1,320 2,640 3,960 5,280

Main Map Scale = 1:24,000

Salem

Albany

Corvallis

4095 ft

Miles

0 10

Service Layer Credits: 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
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Water Availability Tables

Water Availability Analysis

Detailed Reports

SANTIAM R > WILLAMETTE R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 10/2/2019

Watershed ID #: 167 ([Map](#))

Exceedance Level: 80%

Date: 10/2/2019

Time: 12:51 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	5,860.00	1,060.00	4,800.00	0.00	320.00	4,480.00
FEB	6,590.00	3,330.00	3,260.00	0.00	320.00	2,940.00
MAR	5,870.00	2,900.00	2,970.00	0.00	320.00	2,650.00
APR	5,370.00	2,890.00	2,480.00	0.00	320.00	2,160.00
MAY	5,020.00	1,930.00	3,090.00	0.00	320.00	2,770.00
JUN	2,600.00	1,080.00	1,520.00	0.00	320.00	1,200.00
JUL	1,380.00	1,020.00	362.00	0.00	320.00	42.30
AUG	1,030.00	957.00	72.60	0.00	320.00	-247.00
SEP	923.00	847.00	75.60	0.00	320.00	-244.00
OCT	1,020.00	772.00	248.00	0.00	320.00	-71.90
NOV	2,820.00	726.00	2,090.00	0.00	320.00	1,770.00
DEC	5,940.00	719.00	5,220.00	0.00	320.00	4,900.00
ANN	4,380,000.00	1,090,000.00	3,280,000.00	0.00	232,000.00	3,060,000.00

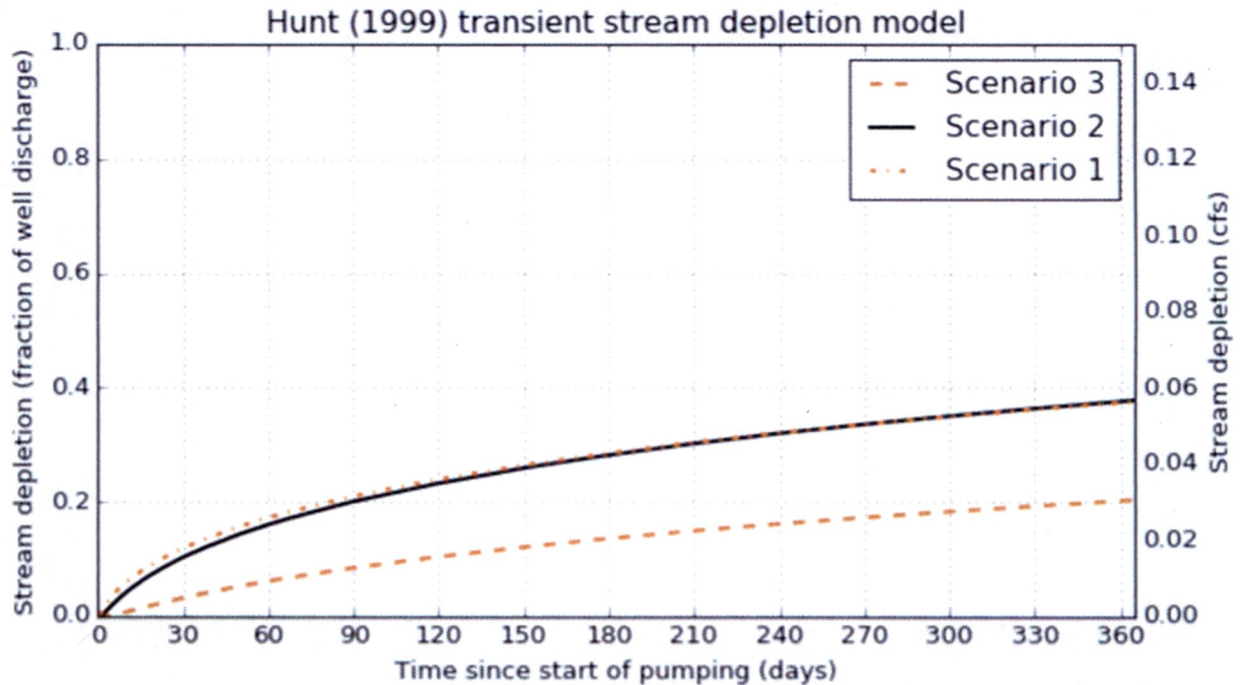
Stream Depletion Analysis
POA 1 – SW 1

Application type:	G
Application number:	18860
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.15
Pumping duration (days):	365.0
Pumping start month number (3=March)	1.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	630	630	630	ft
Aquifer transmissivity	T	42000.0	10000.0	2000.0	ft ² /day
Aquifer storativity	S	0.22	0.19	0.15	-
Aquitard vertical hydraulic conductivity	Kva	0.1	0.05	0.01	ft/day
Not used		0.0	0.0	0.0	
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Not used		0.0	0.0	0.0	
Stream width	ws	160.0	160.0	160.0	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	4	10	16	20	23	26	28	30	32	34	35	36	38
Depletion (cfs)	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06



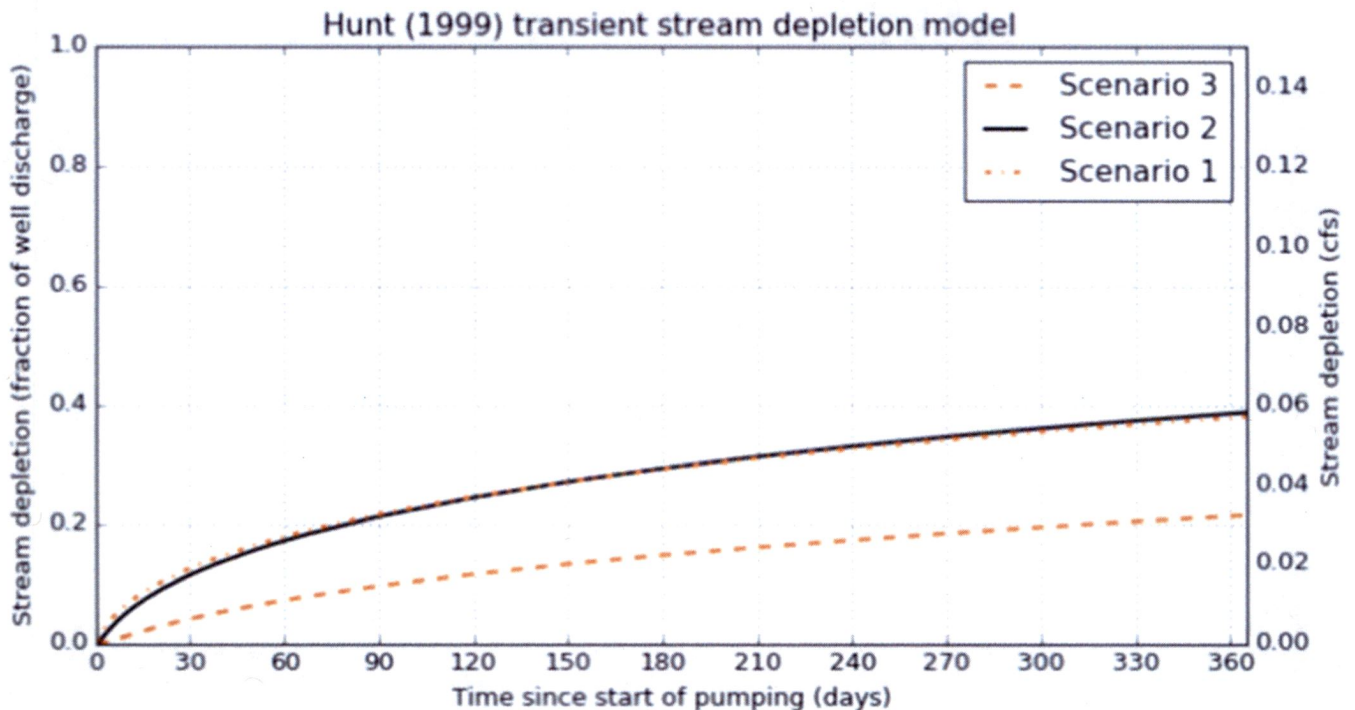
Stream Depletion Analysis (cont.)
POA 2 – SW 1

Application type:	G
Application number:	18860
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.15
Pumping duration (days):	365
Pumping start month number (3=March):	1

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	500	500	500	ft
Aquifer transmissivity	T	42000	10000	2000	ft ² /day
Aquifer storativity	S	0.22	0.19	0.15	-
Aquitard vertical hydraulic conductivity	Kva	0.1	0.05	0.01	ft/day
Not used		0	0	0	
Aquitard thickness below stream	babs	3	3.0	3	ft
Not used		0	0	0	
Stream width	ws	160	160	160	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	5	11	17	21	24	27	29	31	33	35	36	37	39
Depletion (cfs)	0.01	0.02	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06



Stream Depletion Analysis (cont.)

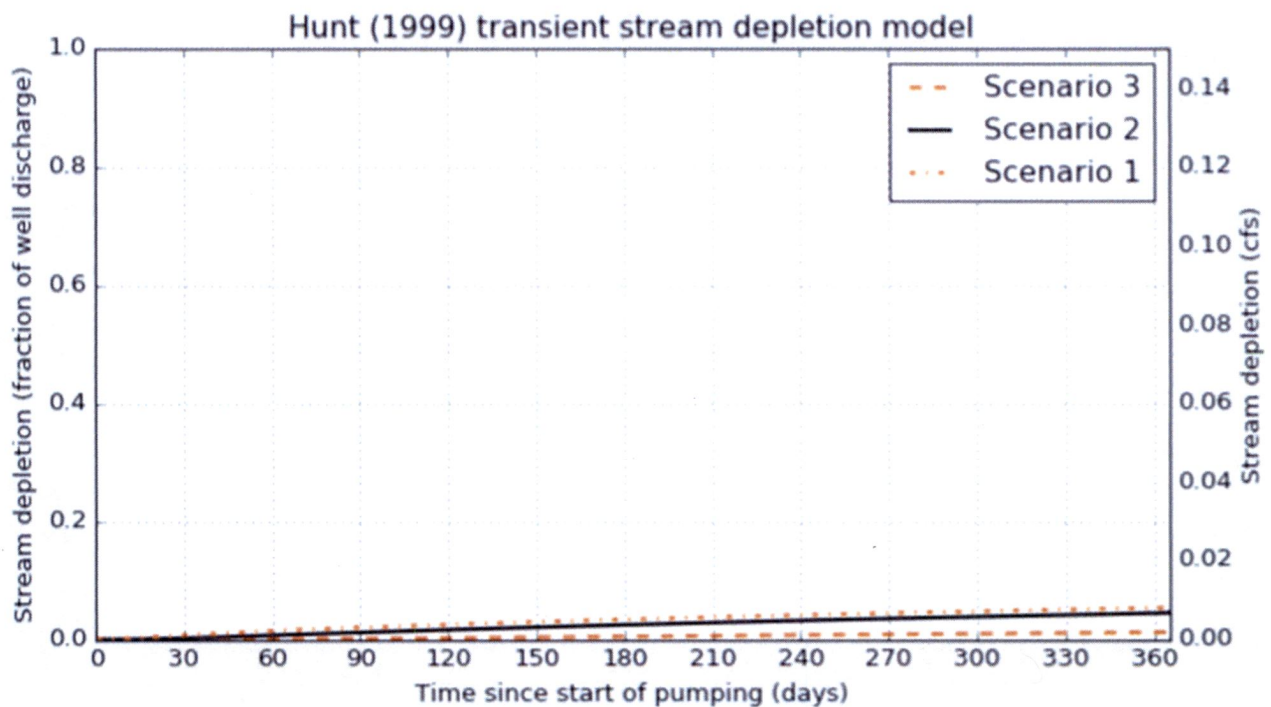
POA 1 – SW 2

Application type:	G
Application number:	18860
Well number:	1
Stream Number:	2
Pumping rate (cfs):	0.15
Pumping duration (days):	365.0
Pumping start month number (3=March)	1.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2550.0	2550.0	2550.0	ft
Aquifer transmissivity	T	42000.0	10000.0	2000.0	ft ² /day
Aquifer storativity	S	0.22	0.19	0.15	-
Aquitard vertical hydraulic conductivity	Kva	0.1	0.05	0.01	ft/day
Not used		0.0	0.0	0.0	
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Not used		0.0	0.0	0.0	
Stream width	ws	20	20	20	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	1	1	2	2	2	3	3	3	4	4	4
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01



Stream Depletion Analysis (cont.)

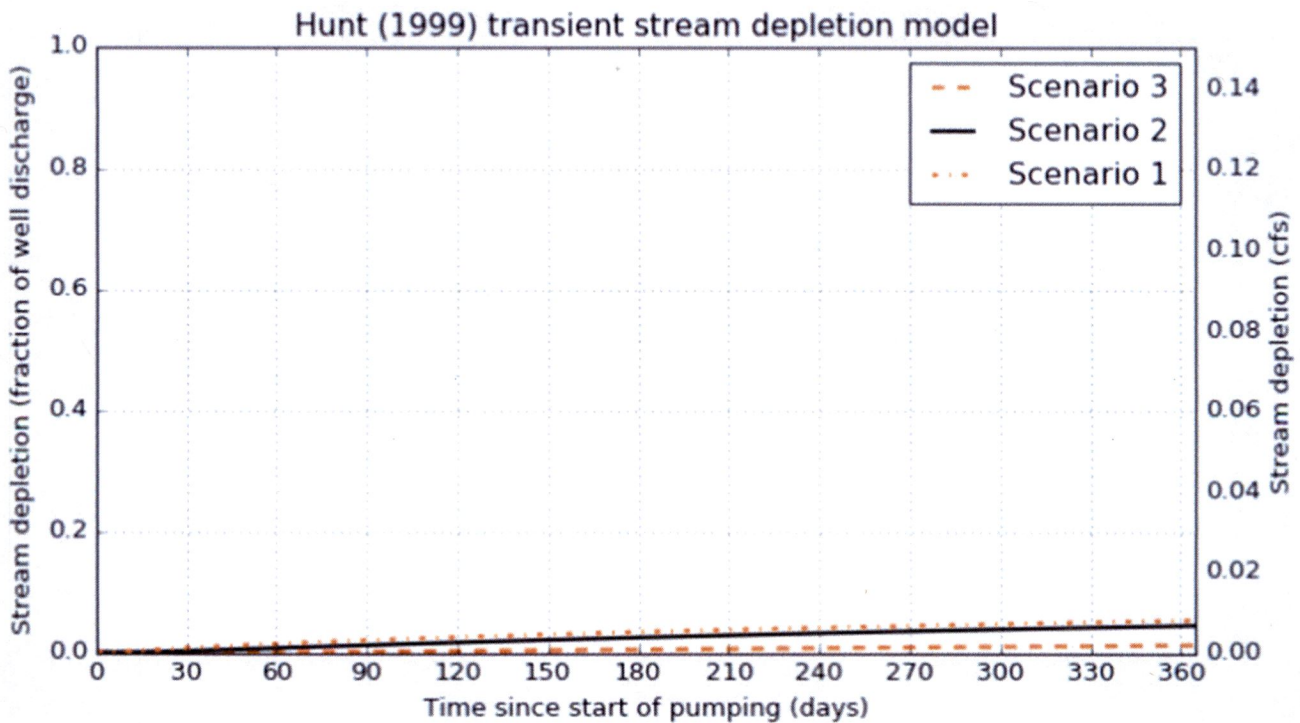
POA 2 – SW 2

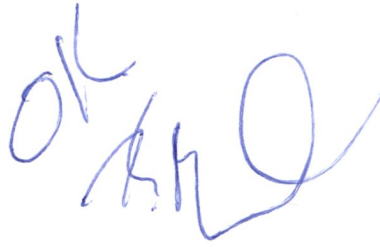
Application type:	G
Application number:	18860
Well number:	4
Stream Number:	2
Pumping rate (cfs):	0.15
Pumping duration (days):	365.0
Pumping start month number (3=March)	1.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	2510	2510	2510	ft
Aquifer transmissivity	T	42000.0	10000.0	2000.0	ft ² /day
Aquifer storativity	S	0.22	0.19	0.15	-
Aquitard vertical hydraulic conductivity	Kva	0.1	0.05	0.01	ft/day
Not used		0.0	0.0	0.0	
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Not used		0.0	0.0	0.0	
Stream width	ws	20	20	20	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	1	1	2	2	2	3	3	4	4	4	4
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01





MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18860
Date: January 17, 2020

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

Applicant's Well #SRA Well 1 SB (MARI 15381): Based on a review of the Well Report, Applicant's Well # SRA Well 1 SB seems to protect the groundwater resource.

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

Applicant's Well #SRA Well 2 NB (MARI 15382): Based on a review of the Well Report, Applicant's Well # SRA Well 2 NB seems to protect the groundwater resource.

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

MARI....

1538

RECEIVED

NOTICE TO WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

AUG 9 1966 WATER WELL REPORT

State Well No. 9/36-33 R

STATE ENGINEER, SALEM, OREGON 97310 ENGINEER STATE OF OREGON (Please type or print)

State Permit No.

(1) OWNER:

Name ORIE. STATE PARKS
Address SALEM ORE.

(2) LOCATION OF WELL: INTERSTATE 5

County MARION Driller's well number
Bearing and distance from section or subdivision corner

Well No. (P)
WEST SIDE

(3) TYPE OF WORK (check):

New Well [x] Deepening [] Reconditioning [] Abandon []

(4) PROPOSED USE (check):

Domestic [] Industrial [] Municipal [] Rotary [] Driven []
Irrigation [] Test Well [] Other [] Cable [x] Jetted []
Dug [] Bored []

(6) CASING INSTALLED:

6" Diam. from 7.5 ft. to 52 ft. Gage .280

(7) PERFORATIONS:

Type of perforator used MILLS KNIFE
Size of perforations 3/8 in. by 2 1/2 in.
77 perforations from 435 ft. to 49 ft.

(8) SCREENS:

Well screen installed? [] Yes [x] No
Manufacturer's Name
Model No.

(9) CONSTRUCTION:

Well seal—Material used in seal CEMENT + BENTONITE
Depth of seal 20 ft. Was a packer used? NO
Diameter of well bore to bottom of seal 10 in.
Was any loose strata cemented off? [] Yes [x] No
Was a drive shoe used? [x] Yes [] No
Was well gravel packed? [] Yes [x] NO Size of gravel:
Gravel placed from ft. to ft.
Did any strata contain unusable water? [] Yes [x] NO
Type of water? depth of strata
Method of sealing strata off

(10) WATER LEVELS:

Static level 14 1/2 ft. below land surface Date 7-22-66
Artesian pressure lbs. per square inch Date

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? [x] Yes [] No If yes, by whom? MILLER
Yield: 53 gal./min. with 31 ft. drawdown after 3 hrs.

(12) WELL LOG:

Diameter of well below casing 6
Depth drilled 52 ft. Depth of completed well 52 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

Table with columns MATERIAL, FROM, TO. Rows include MEDIUM GRAVEL + SILT, BROWN CLAY + MEDIUM GRAVEL, SMALL TO MEDIUM GRAVEL WITH SAND, BLUE CLAY.

Work started 7-15-66 Completed 7-22-66
Date well drilling machine moved off of well 11-11-66

(13) PUMP:

Manufacturer's Name
Type: H.P.

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-ROBINSON + WEST
Address 5545 JOSEPH ST. S.E. SALEM

Drilling Machine Operator's License No.
[Signed] HAROLD B. MILLER (Water Well Contractor)

Contractor's License No. 37 Date 8-5-66, 19.

RECEIVED

MARI 15382

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

AUG 9 1966

WATER WELL REPORT

State Well No. 9/3W-33R
State Permit No.

(1) OWNER:

Name ORG. STATE PARKS
Address SALIEM ORG.

(2) LOCATION OF WELL: WATER STATE 5

County MARION Driller's well number
1/4 Section S.E. 33T. 9, S, R. 3, W, W.M.
Bearing and distance from section or subdivision corner
North No. (2)
EAST SIDE

(3) TYPE OF WORK (check):

New Well [X] Deepening [] Reconditioning [] Abandon []
Abandonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic [] Industrial [X] Municipal []
Irrigation [] Test Well [] Other []

(5) TYPE OF WELL:

Rotary [] Driven []
Cable [X] Jetted []
Dug [] Bored []

(6) CASING INSTALLED:

6" Diam. from 7.2 ft. to 50 ft. Gage 28.0
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS:

Perforated? [X] Yes [] No
Type of perforator used MILLS KNIFE
Size of perforations 3 in. by 25 in.
49 perforations from 44 ft. to 48 ft.
161 perforations from 25 ft. to 38 ft.

(8) SCREENS:

Well screen installed? [] Yes [X] No
Manufacturer's Name
Model No.
Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Well seal—Material used in seal CEMENT & BENTONITE
Depth of seal 20 ft. Was a packer used? NO
Diameter of well bore to bottom of seal 10 in.
Were any loose strata cemented off? [] Yes [X] No Depth
Was a drive shoe used? [X] Yes [] No
Was well gravel packed? [] Yes [X] NO Size of gravel:
Gravel placed from ft. to ft.
Did any strata contain unusable water? [] Yes [X] NO
Type of water? depth of strata
Method of sealing strata off

(10) WATER LEVELS:

Static level 16 1/2 ft. below land surface Date 7-29-66
Artesian pressure lbs. per square inch Date

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [] No If yes, by whom? MILLER & ROBINSON
Yield: 265 gal./min. with 3 in. drawdown after 3 hrs.
" " " "
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? [] Yes [X] No

(12) WELL LOG:

Diameter of well below casing 6
Depth drilled 48 1/2 ft. Depth of completed well 48 1/2 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

Table with columns MATERIAL, FROM, TO. Rows include Top Soil, Medium GRAVEL WITH SILT + SAND, MEDIUM GRAVEL & SAND, SILT - SAND & GRAVEL, SMALL MEDIUM GRAVEL, BLUE CLAY.

Work started 7-25-66 19 Completed 7-29-66 19
Date well drilling machine moved off of well 11-11-11 19

(13) PUMP:

Manufacturer's Name
Type: H.P.

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-Robinson & West
(Person, firm or corporation) (Type or print)

Address 5545 So. 9th St. S.E. SALIEM

Drilling Machine Operator's License No.

[Signed] Healan B. Miller (Water Well Contractor)
Contractor's License No. 37 Date 8-5-66 19