

Approved:



MEMO

To: Kristopher Byrd, Well Construction Manager
From: Tommy Laird, Well Construction Program Coordinator
Subject: Review of Water Right Application G-17937
Date: February 23, 2024

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Aurora Bouchier and Karl Wozniak reviewed the application. Please see Aurora's and Karl's Groundwater Review and the Well Report.

Applicant's Well #1 (MARI 6106): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

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

WATER WELL REPORT
STATE OF OREGON

MARION 6/106

RECEIVED

NOV 17 1982

State Well No. 75/100-6 bd

WATER RESOURCES DEPT.
SALEM, OREGON

State Permit No.

(1) OWNER:

Name Robert Schmidgall
Address 9923 Silverton Rd. N.E.
City Silverton, Oregon 97381 State

(2) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Air Driven
Rotary Mud Dug
 Bored

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other
Thermal Withdrawal ReInjection

(5) CASING INSTALLED:

Steel Plastic
Threaded Welded
10" Diam. from 1+ ft. to 140 ft. Gauge .250

(6) LINER INSTALLED:

none "Diam. from ft. to ft. Gauge

(6) PERFORATIONS:

Perforated? Yes No
Type of perforator used Mills Knife
Size of perforations 3/8 in. by 3 in.
636 perforations from 80 ft. to 133 ft.

(7) SCREENS:

Well screen installed? Yes No
Manufacturer's Name
Type Model No.
Diam. Slot Size Set from ft. to ft.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? Stettlers
240 gal./min. with 884 ft. drawdown after 2 hrs.
Air test gal./min. with drill stem at ft. hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water XX Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Special standards: Yes No
Well seal—Material used Cement
Well sealed from land surface to 20 ft.
Diameter of well bore to bottom of seal 16 in.
Diameter of well bore below seal 10 in.
Number of sacks of cement used in well seal 32 sacks
How was cement grout placed? Gravity pressure

Was pump installed? no Type HP Depth ft.
Was a drive shoe used? Yes No Plugs Size: location ft.
Did any strata contain unusable water? Yes No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? Yes No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:

County Marion Driller's well number
S.E. 1/4 N.W. 1/4 Section 6 T. 7 S. R. 1 W. W.M.
Tax Lot # Lot Blk Subdivision
Address at well location: same as item (1)

(11) WATER LEVEL: Completed well.

Depth at which water was first found approx. 65 ft.
Static level 41 ft. below land surface. Date 10/26/82
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing 0
Depth drilled 140 ft. Depth of completed well 140 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Top soil- brn.-	0	2	
Clay- brn.-	2	30	
Clay- greyish-brn.-	30	32	
Clay- grey & sticky-	32	38	
Clay-brn. & sandy-	38	56	
Med.conglom.-med.hd.-brn.-	56	62	
Clay- brn.-	62	64	
Med. conglom.- brn.-hd.-(W.b.)	64	127	
Clay-grey with streaks of gravel	127	130	
Med.conglom.grey-hd.-(W.b.)	130	133	
Clay- grey-	133	140	

Work started 10/6/82 19 Completed 10/29/82 19
Date well drilling machine moved off of well 11/8/82 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Ram Saubman Date 11-12-82
(Drilling Machine Operator)
Drilling Machine Operator's License No. 232

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 R. Stadel & Sons, Inc.
(Person, firm or corporation) (Type or print)
Address 11364 Evergreen Rd. N.E., Silverton, Or. 97381
[Signed] Paul R. Stadel
(Water Well Contractor)
Contractor's License No. 296 Date 11/10/82 19

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion. SP*12658-690

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date March 16, 2015

FROM: Groundwater Section Aurora C. Bouchier / Karl C. Wozniak
Reviewer's Name

SUBJECT: Application G- 17937 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: Robert J. and Eleanor E. Schmidgall County: Marion

A1. Applicant(s) seek(s) 0.487 cfs from 1 (MARI 6106) well(s) in the Willamette Basin,
Molalla-Pudding subbasin Quad Maps: Stayton NE, Silverton, and Salem East

A2. Proposed use irrigation, 38.93 acres Seasonality: April 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 6160	1	Alluvium	0.487	07S/01W-6 SE-NW	160' N, 505' W fr center S 6
2						
3						
4						
5						

* 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	200	64-127	41	10/26/1982	140	0-20	+1-140		80-133			

Use data from application for proposed wells.

A4. **Comments:** The application gives metes and bounds to the property boundary. The location of the well is shown in Table A3 and the attached map based on a comparison of tax lots, Google Earth images, and the application map. The application specifies a maximum rate of 0.535 cfs (240 gpm). Since the proposed use is irrigation of 38.93 acres, the maximum rate we will allow is 38.93 acres * 1/80 cfs per acre = 0.487 cfs (219 gpm). Therefore the review is based on a maximum rate of 0.487 cfs.

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 applicant's well is greater than ¼ mile from a surface water source, and produces from a confined aquifer, so the pertinent basin rules (OAR 690-502-0240) do not apply.

A6. Well(s) # _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: _____
 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) 7C, Seven Year Minimum Measurement;
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

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

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

B3. **Groundwater availability remarks:** The area around the applicant’s well is underlain by about 65 feet of Willamette Silt which is underlain by a series of sands and gravels that are interbedded with silts and clays. The water table occurs near land surface in the Willamette Silt which acts as a regional confining unit. The shallowest gravel bed (called a conglomerate in the well log) in the subject well, MARI 6106, was logged near the base of the Willamette Silt at depths of 56-62 feet below land surface. This corresponds to elevations of approximately 140-150 feet above mean sea level (amsl). The upper surface of the Willamette Silt forms a broad terrace, locally at an elevation of approximately 200 feet amsl. Local streams cut progressively through the terrace until they flow into the Willamette River at an elevation of about 55 feet amsl, well below the top of the upper gravel layer noted in MARI 6106. Water levels in nearby observation wells suggest that groundwater levels are reasonably stable in this area.

Because the productive sand and gravel beds are confined, the cone of depression from the well will spread over a broad area and may interact with multiple surface water bodies. However, more than 20 feet of saturated Willamette Silt occurs between the local surface water bodies and the productive sand and gravel beds at depth. These fine-grained sediments will decrease the efficiency of the groundwater/surface water connection.

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

Basis for aquifer confinement evaluation: Reports indicate that the Willamette Silt is a regional confining unit which hosts the water table at shallow depths. This is consistent with information on the well log for MARI 6106, which shows a static water level approximately 22 feet above the top of the first productive gravel at 64 feet below ground surface.

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	Putdng River	159	155-158	2,910	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Published water table maps and reports indicate that the groundwater flows towards, and discharges into, The Putdng River and other local perennial streams. Head data from MARI 6106 and nearby wells corroborate this.

Water Availability Basin the well(s) are located within: WAB 152 (Putdng R > Molalla R –AB Howell Prairie).

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"/>	MF 152A	10.00	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	<<25	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

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

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

Comments: The Pudding River stream depletion at 30 days was estimated using the Hunt 2003 model. The presence of low permeability Willamette Silt between the aquifer and the beds of streams results in an inefficient connection between the aquifer and the stream, therefore the stream depletion at 30 days is much less than 25%. However, stream depletion will increase over time until all of the pumped water is balanced by reduced stream flow.

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

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

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

Basis for impact evaluation: _____

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: Conlon, T. D., Wozniak, K. C., Woodcock, D., Herrera, N.B., Fischer, B.J. Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-Water Hydrology of the Willamette Basin, Oregon: U. S. Geological Survey Scientific Investigations Report 2005-5168, 83 p.

Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-A.

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: U. S. Geological Survey Scientific Investigations Report: 2014-5136.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, Justin, 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: Corvallis, Oregon, Oregon State University, M.S. thesis.

Woodward, Dennis B.G., Gannett, Marshall W., and Vaccaro, John J., 1998 Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-B.

The subject well (MARI 6106) and nearby well logs and water level data, especially MARI 17590, MARI 3510, MARI 58801, and MARI 6109.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: 1 Logid: MARI 6106

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) _____

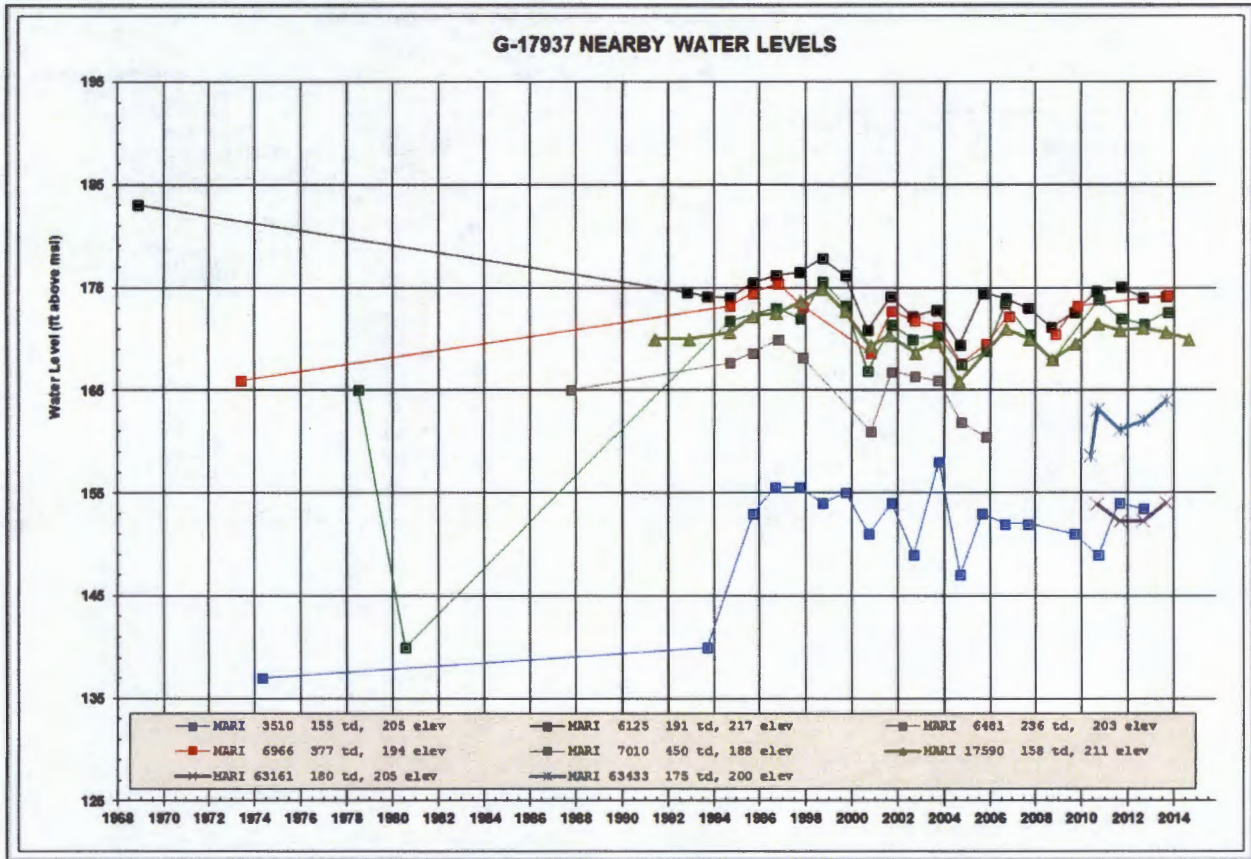
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

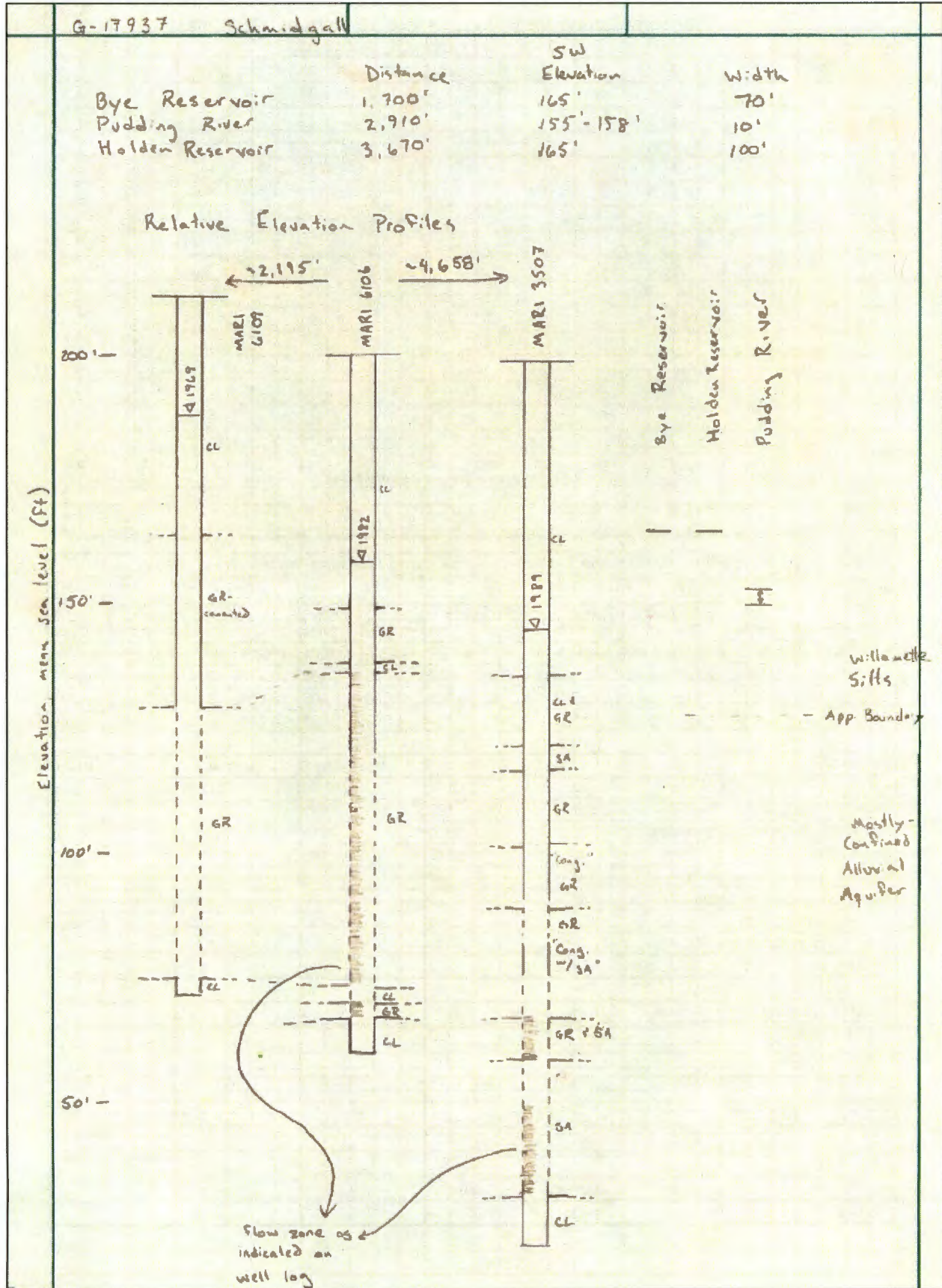
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 152		PUDDING R > MOLALLA R - AB HOWELL PRAIRIE			Exceedance Level: 80	
Time: 3:27 PM		Basin: WILLAMETTE			Date: 03/09/2015	
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	603.00	69.60	533.00	0.00	10.00	523.00
FEB	649.00	60.80	588.00	0.00	10.00	578.00
MAR	587.00	42.90	544.00	0.00	10.00	534.00
APR	451.00	24.40	427.00	0.00	10.00	417.00
MAY	235.00	17.10	218.00	0.00	10.00	208.00
JUN	111.00	32.20	78.80	0.00	10.00	68.80
JUL	43.60	47.80	-4.17	0.00	10.00	-14.20
AUG	24.70	40.20	-15.50	0.00	10.00	-25.50
SEP	22.70	25.30	-2.58	0.00	10.00	-12.60
OCT	38.90	7.35	31.50	0.00	10.00	21.50
NOV	233.00	18.50	214.00	0.00	10.00	204.00
DEC	608.00	63.60	544.00	0.00	10.00	534.00
ANN	385,000	27,100	359,000	0	7,240	352,000

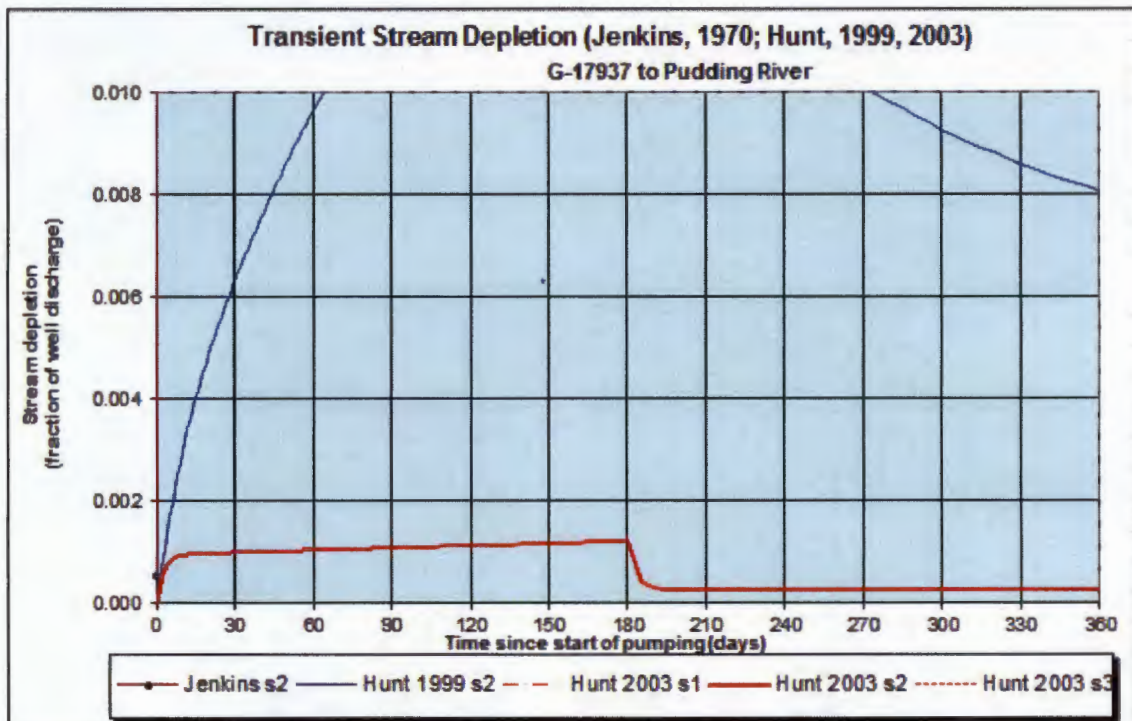
Water Level Trends



Elevation Profile for Well, Nearby Wells and Local Surface Water Bodies



Stream Depletion Model Results



Output for Stream Depletion, Scenerio 2 (s2):												Time pump on (pumping duration) = 180 days				
Days	30	60	90	120	150	180	210	240	270	300	330	360				
J SD	84.1%	88.7%	90.8%	92.0%	92.8%	93.5%	9.9%	5.6%	3.9%	2.9%	2.3%	1.9%				
H SD 1999	0.6%	1.0%	1.2%	1.4%	1.6%	1.8%	1.3%	1.1%	1.0%	0.9%	0.9%	0.8%				
H SD 2003	0.10%	0.10%	0.11%	0.11%	0.12%	0.12%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%				
Qw, cfs	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488	0.488				
H SD 99, cfs	0.003	0.005	0.006	0.007	0.008	0.009	0.006	0.006	0.005	0.005	0.004	0.004				
H SD 03, cfs	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000				

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	219.00	219.00	219.00	gpm
Time pump on (pumping duration)	tpon	180	180	180	days
Perpendicular from well to stream	a	2910	2910	2910	ft
Well depth	d	140	140	140	ft
Aquifer hydraulic conductivity	K	50	50	50	ft/day
Aquifer saturated thickness	b	70	70	70	ft
Aquifer transmissivity	T	3500	3500	3500	ft ² /day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	0.01	0.01	0.01	ft/day
Aquitard saturated thickness	ba	30	30	30	ft
Aquitard thickness below stream	babs	20	20	20	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	10	10	10	ft
Streambed conductance (lambda)	sbc	0.005000	0.005000	0.005000	ft/day
Stream depletion factor	sdf	2.419457	2.419457	2.419457	days
Streambed factor	sbf	0.004157	0.004157	0.004157	
input #1 for Hunt's Q_4 function	t'	0.413316	0.413316	0.413316	
input #2 for Hunt's Q_4 function	K'	0.806486	0.806486	0.806486	
input #3 for Hunt's Q_4 function	epsilon'	0.005000	0.005000	0.005000	
input #4 for Hunt's Q_4 function	lamda'	0.004157	0.004157	0.004157	

Application Review Map

