

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date May 31, 2016
 FROM: Groundwater Section Aurora C Bouchier
Reviewer's Name
 SUBJECT: Application G- 18261 Supersedes review of na
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: Jay Thompson County: Marion

A1. Applicant(s) seek(s) 0.557 cfs from 1 well(s) in the Willamette Basin,
Molalla-Pudding subbasin

A2. Proposed use irrigation (95.0 acres) Seasonality: March 1 – Oct 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	17948	CRB	0.557 (250 gpm)	7S/2W-25 SE-NE	2400' S, 1000' W fr NE cor S 25
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	225	90*	30	7/8/1992	146	0-76	+1-78	66-146	90-144	60	55	A

Use data from application for proposed wells.

A4. **Comments:** *The well log lists water from 3 to 10 feet in clay and sand, and lists that water was first found at 90 feet within the basalts.

The applicant is requesting 250 gpm (0.557 cfs) to irrigate 95 acres. Based on the estimated yield reported on the well log it is not certain the well will be able to produce the requested amount.

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 well produces from a confined basalt 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) 7N, 7I, 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 _____ 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 beneath the proposed well is underlain by a thin veneer of sediments which is underlain by a thick sequence (up to 300 feet) of Columbia River Basalt (Conlon and others, 2005). Thick basalt flow interiors generally have very low vertical permeability which leads to thin, tabular aquifers that are generally isolated from one another under natural conditions. Based upon the well log for MARI 17948, the applicant's well is likely open to multiple water-bearing zones in the basalts. The water-bearing zone listed from 90-100 feet is correlated with the base of the Silver Falls basalt, the porous basalt listed from 136-140 feet may be correlated with the Sentinel Bluffs basalt. **The Silver Falls basalt (as well as the underlying Sentinel Bluffs basalt) is exposed in (and hydraulically connected to) nearby reaches of both the Pudding River to the northeast of the applicant's well and the unnamed tributary of the Pudding River to the southwest of the applicant's well.** This shallow water-bearing zone is also the source aquifer for many domestic wells in the area. Water level trends are not currently monitored in any of the domestic wells, but a least 40 wells have been deepened and 7 wells have been abandoned out of a total 306 wells in sections 23, 24, 25, 26, 35, and 36 of township 7S, range 2W, and sections 19, 30, and 31 of township 7S, range 1W. This suggests that the shallow water-bearing zones are already subject to undue interference.

Because the aquifers are confined (storativity is estimated to be 0.0001 for the CRBG), pumping impacts will propagate outward at rapid rates and are likely to reach aquifer boundaries (streams, faults, and truncated basalt flow margins) within a few hours. Using aquifer parameters appropriate for the basalts, it can be shown that the cone of depression from a pumped well will produce measurable impacts at a distance of 1 mile within several hours. Therefore, hydraulic interference with nearby wells, springs, and streams will occur rapidly once pumping begins. The presence of local aquifer boundaries will increase the degree of interference with nearby wells that are completed in the same water-bearing zones.

In general, water levels in nearby basalt irrigation wells show stable water levels over the last twenty years. Limited data (primarily from MARI 53069, MARI 53068, and MARI 736) indicate that seasonal fluctuations are on the order of 10-20 feet. Many basalt irrigation rights have been issued in the area over the last 30 years but the extent to which all of these rights

are exercised in any given year is unknown. However, stable water levels suggest some additional capacity for development. Well logs for nearby basalt wells show a median yield of 250 gpm and a range from 10-850 gpm. The well log for MARI 17948 reports a yield of 43-60 gpm (air test). Water may be available in the amount requested, although multiple wells may be required to obtain the amount.

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	CRBG	<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: In general, the Columbia River Basalt aquifers are confined by the dense interflow zones which restrict vertical movement of groundwater. The well log for MARI 17948 lists a static water level of 30 feet, some 60 feet above the zone at which it was encountered, corroborating the confined nature of the water-bearing zone of the CRBG at this location.

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 Trib to Pudding River	~190-195	185-260	1240	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Pudding River	~190-195	187-225	3000	<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"/>

Basis for aquifer hydraulic connection evaluation: The July static water level provided by the driller indicates a water elevation of approximately 195 feet msl. The hydrograph of nearby MARI 6328 show the water level fluctuating around approximately 192 feet in elevation since 1992, supporting the groundwater elevation. At the nearest reach (~1240 feet), the unnamed tributary to the Pudding River has an elevation of approximately 197 feet, within a mile of the well the elevation ranges from ~185-270 feet msl. At the nearest reach (~2950 feet), the Pudding River has an elevation of approximately 189 feet msl, within a mile of the well the elevation ranges from ~187-225 feet msl.

Water Availability Basin the well(s) are located within: 152: Pudding 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 checked="" type="checkbox"/>	<input type="checkbox"/>	--	--	<input type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	See Below	<input checked="" type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>	MF 152	10.0	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	See Below	<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"/>

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

Comments: An appropriate model for calculating stream interference is not readily available for the basalt aquifer system. Therefore, no estimate of stream interference as 30 days was included in table C3a.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: _____

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:** _____

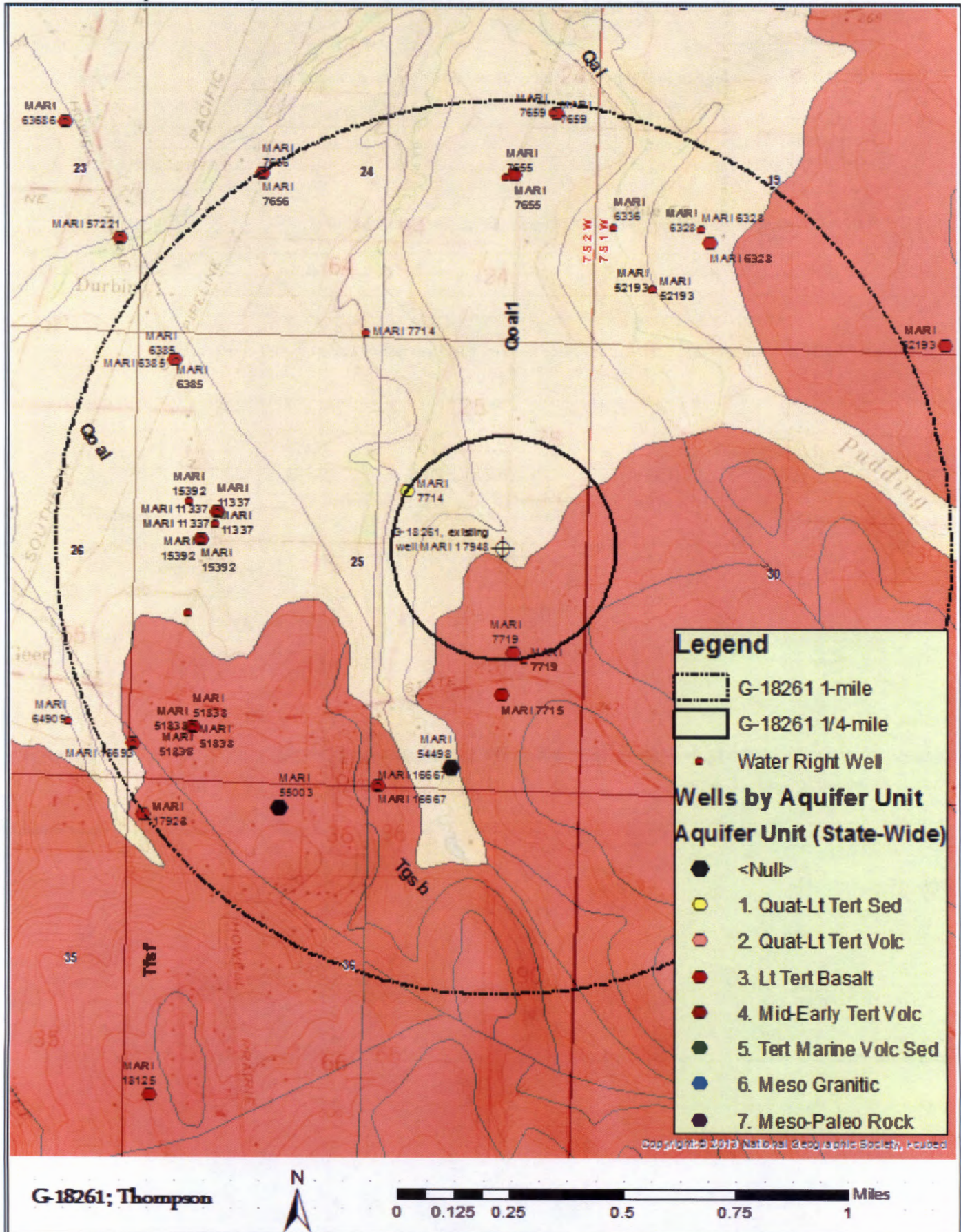
D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 152 Time: 12:14 PM		PUDDING R > MOLALLA R - AB HOWELL PRAIRIE Basin: WILLAMETTE			Exceedance Level: 80 Date: 05/31/2016	
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	69.80	533.00	0.00	10.00	523.00
FEB	649.00	61.00	588.00	0.00	10.00	578.00
MAR	587.00	43.10	544.00	0.00	10.00	534.00
APR	451.00	24.60	426.00	0.00	10.00	416.00
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	215.00	0.00	10.00	205.00
DEC	608.00	63.80	544.00	0.00	10.00	534.00
ANN	385,000	27,200	358,000	0	7,240	352,000

DETAILED REPORT OF INSTREAM REQUIREMENTS													
Watershed ID #: 152 Time: 12:14 PM		PUDDING R > MOLALLA R - AB HOWELL PRAIRIE										Basin: WILLAMETTE Date: 05/31/2016	
Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly values are in cfs.													
MF152A	CERTIFICATE	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.00	10.0
IS73535A	CERTIFICATE	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.70	6.7
IS73536A	CERTIFICATE	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.00	5.0
MAXIMUM		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Well Location Map



Water-Level Trends in Nearby Wells

