WATER RESOURCES DEPARTMENT

MEMO December 1, 2015

TO: **Application G-** 18126

FROM: **GW:** Phillip Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES
The source of appropriation is within or above a Scenic Waterway
☒ NO

☐ YES
Use the Scenic Waterway condition (Condition 7J)
☒ NO

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **11/30/2015**

FROM: Groundwater Section **Phillip I. Marcy / Ivan K. Gall**
Reviewer's Name

SUBJECT: Application G- **18126** 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: **George and Dorothy Iida** County: **Malheur**

A1. Applicant(s) seek(s) **0.668** cfs from **1** well(s) in the **Malheur** Basin, _____ subbasin

A2. Proposed use **Irrigation (128.2 acres)** Seasonality: **March 1st to October 15th (228 days)**

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	MALH 54129	Y-1	Alluvium	0.668	18S/47E-20 NW-NE	148'S, 1895'W fr NE cor S 20
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	2198	19	8.5	05/07/2014	57	0-19	+2-20	None	20-40	375	35	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA well (MALH 54129) is constructed to produce from sand and gravel aquifer, likely unit **Qsbf** of Ferns and others (1993). No continuous confining layer exists above the production zone in this area. See attached well log.

A5. ☒ **Provisions of the** Malheur (690-510) 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: _____

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) _____;
   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:***
If a permit is issued, the following conditions shall apply:
7C – Seven Year Minimum Measurement Condition; "Large Water Use Reporting".

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	**Quaternary fluvial sands and gravels**	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: No confining layer exists above the production zone within the proposed POA well. Fine grained soil deposits noted on log are likely moderately permeable, and are not likely laterally extensive.

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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Snake River**	**2191**	**2150**	**7700**	☒	☐	☐	☐	☒
1	2	**Malheur River**	**2191**	**2156**	**23000**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Proposed POA well is in an area of groundwater discharge feeding local streams. The hydraulic connection may be diffuse and inefficient, however, as the overlying silt in some locations may impede the flux of baseflow to the Snake River (Gannett, 1990).

Water Availability Basin the well(s) are located within: Malheur R > Snake R – At Mouth (31011701)

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: No surface water sources within 1 mile.

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
1	**2**	**26.4 %**	**23.2 %**	**.97 %**	**5.4 %**	**10.9%**	**16.2 %**	**21.0 %**	**25.1 %**	**28.9 %**	**31.7 %**	**32.5 %**	**29.5 %**
Well Q as CFS				**0.668**	**0.668**	**0.668**	**0.668**	**0.668**	**0.668**	**0.668**	**0.668**		
Interference CFS		**.176**	**.155**	**.006**	**.036**	**.073**	**.108**	**.140**	**.168**	**.193**	**.212**	**.217**	**.197**
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													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.		**0.176**	**0.155**	**0.006**	**0.036**	**0.073**	**0.108**	**0.140**	**0.168**	**0.193**	**0.212**	**0.217**	**0.197**
(B) = 80 % Nat. Q		**154.0**	**267.0**	**467.0**	**780.0**	**524.0**	**324.0**	**150.0**	**99.9**	**83.8**	**106.0**	**135.0**	**132.0**
(C) = 1 % Nat. Q		**1.54**	**2.67**	**4.67**	**7.80**	**5.24**	**3.24**	**1.50**	**0.999**	**0.838**	**1.06**	**1.35**	**1.32**
(D) = (A) > (C)													
(E) = (A / B) x 100		**0.11%**	**.058%**	**.001%**	**.005%**	**.014%**	**.333%**	**.093%**	**.168%**	**.230%**	**.200%**	**.161%**	**.149%**

(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: Though considerably closer to the Snake River, the proposed right was evaluated here against the Malheur River water availability basin (WAB). There is no WAB associated with the Snake River and the proposed POA falls just outside the WAB for the Malheur River (31011701). Given the proximity to this WAB, I deem it appropriate to consider the potential impacts of issuing a permit to use groundwater at this location.

Expected stream depletion was calculated using the model of Hunt (2003), using parameters derived from local pump tests, well logs, and mapped geology (Ferns and others, 1993; Gannett, 1990). See attached results of model.

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:** The distance between the proposed POA and surface waters likely precludes substantial interference from pumping at this location.

References Used:

Gannett, M.W. 1990, Hydrogeology of the Ontario Area, Malheur County, Oregon: Oregon Water Resources Department Groundwater Report No. 34.

Ferns. M.L., H.C. Brooks, J.G. Evans, M.L. Cummings. 1993. Geologic map of the Vale 30x60 minute quadrangle, Malheur County, Oregon and Owyhee County, Idaho. Oregon Dept. of Geology and Mineral Industries Geological Map Series 77.

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

Area well logs, nearby pump test results.

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

MALHEUR R > SNAKE R - AT MOUTH
Basin: MALHEUR

Watershed ID #: 31011701
Time: 9:29 AM

Exceedance Level: 80
Date: 11/30/2015

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	154.00	427.00	-273.00	0.00	0.00	-273.00
FEB	267.00	626.00	-359.00	0.00	0.00	-359.00
MAR	467.00	911.00	-444.00	329.00	0.00	-773.00
APR	780.00	1,060.00	-278.00	470.00	0.00	-748.00
MAY	524.00	957.00	-433.00	0.00	0.00	-433.00
JUN	324.00	857.00	-533.00	0.00	0.00	-533.00
JUL	150.00	686.00	-536.00	0.00	0.00	-536.00
AUG	99.90	540.00	-440.00	0.00	0.00	-440.00
SEP	83.80	376.00	-292.00	0.00	0.00	-292.00
OCT	106.00	209.00	-103.00	0.00	0.00	-103.00
NOV	135.00	223.00	-87.90	0.00	0.00	-87.90
DEC	132.00	297.00	-165.00	0.00	0.00	-165.00
ANN	338,000	432,000	29,500	48,200	0	0

Well Location Map

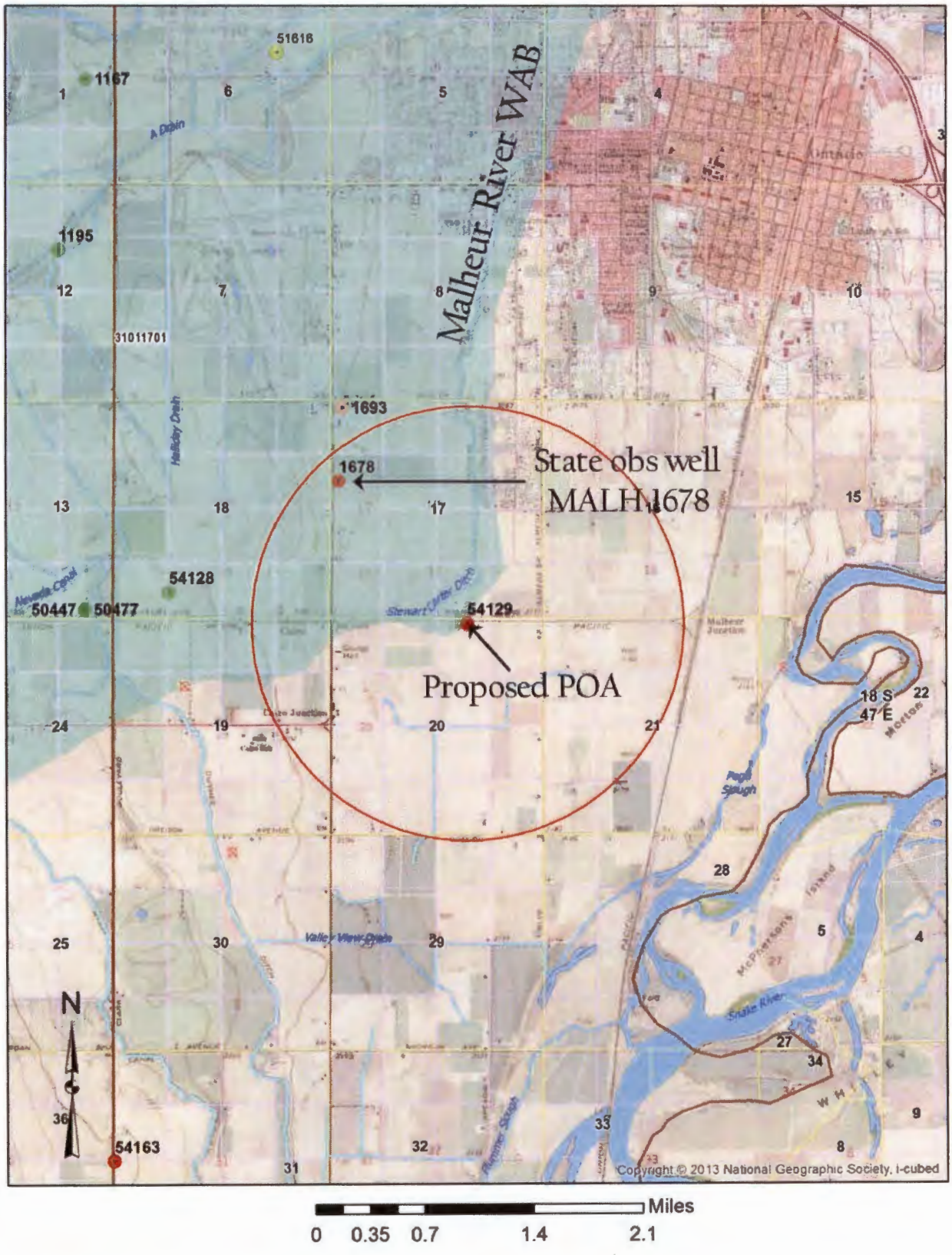


Figure 1: Location of proposed POA well MALH 54129, as compared to the Malheur River WAB and the Snake River to the east. Also shown is State Observation Well MALH 1678 less than 1 mile to the NW.

Water-Level Trends in Nearby Wells

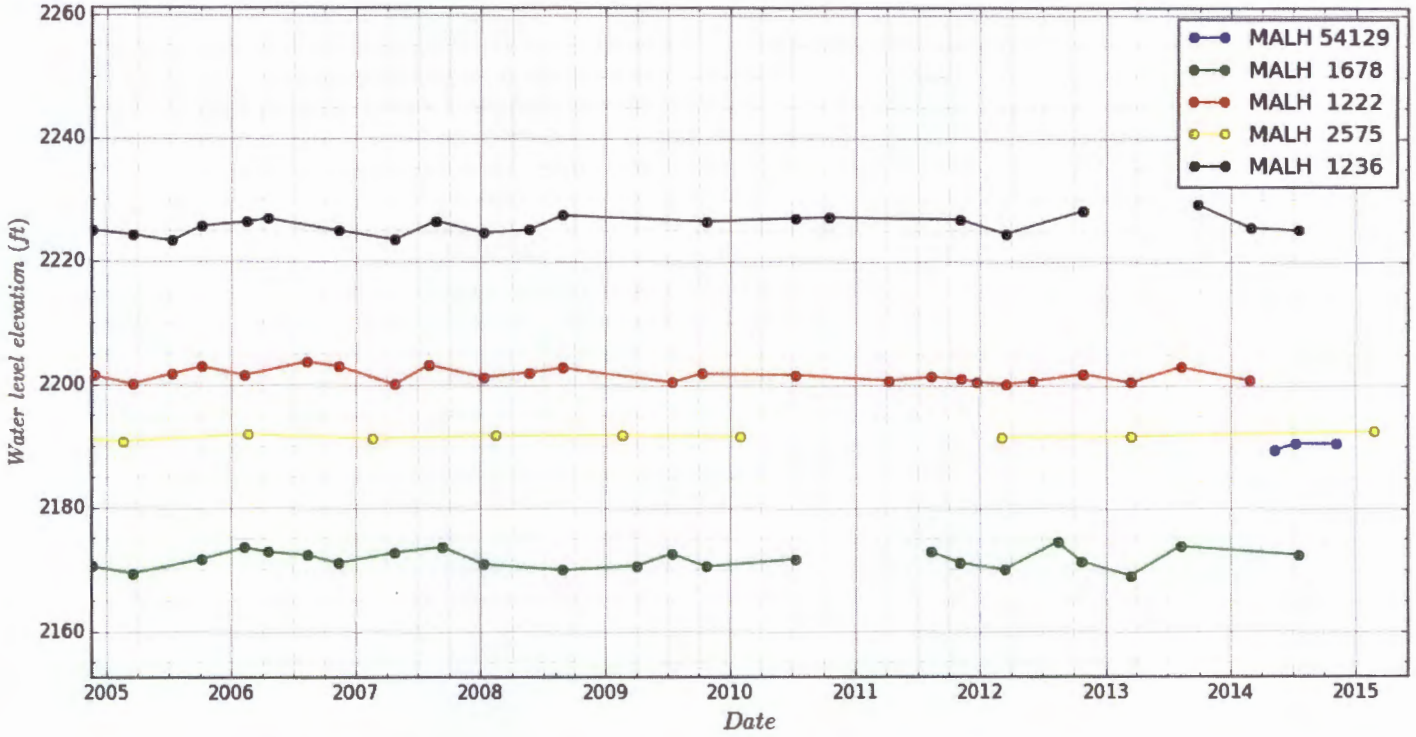
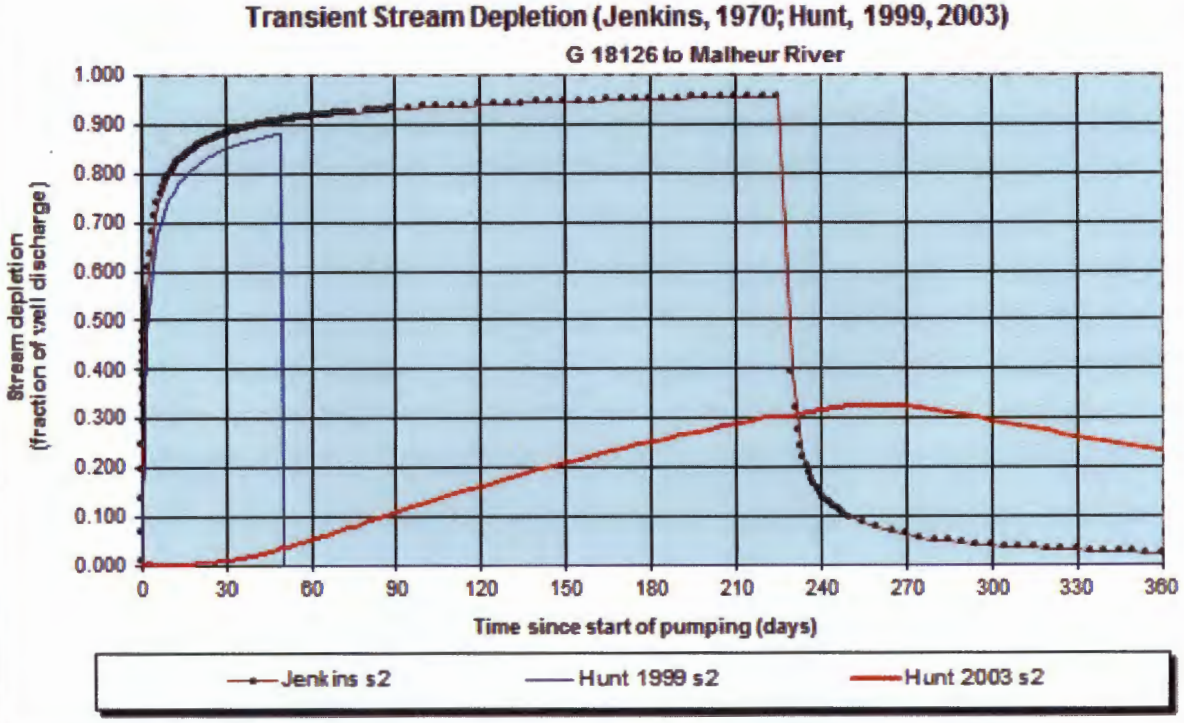


Figure 2: Groundwater elevations are shown here from local wells during the past decade, including recent measurements of the proposed POA (MALH 54129). MALH 1678 is less than one mile NW of the proposed POA, and is constructed to produce from the same shallow sand and gravel aquifer. MALH 2575 and MALH 1236 are located 3.4 miles and 4.4 miles to the west, respectively.



Output for Stream Depletion, Scenerio 2 (s2):	Time pump on (pumping duration) = 228 days											
Days	30	60	90	120	150	180	210	240	270	300	330	360
JSD	88.1%	91.6%	93.1%	94.1%	94.7%	95.1%	95.5%	14.4%	6.1%	3.9%	2.9%	2.2%
HSD 1999	85.1%	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
HSD 2003	0.97%	5.38%	10.93%	16.19%	#####	25.10%	28.91%	31.74%	#####	29.51%	#####	#####
Qw, cfs	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668	0.668
HSD 99, cfs	0.569	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
HSD 03, cfs	0.006	0.036	0.073	0.108	0.140	0.168	0.193	0.212	0.217	0.197	0.176	0.155

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.67	0.67	0.67	cfs
Time pump on (pumping duration)	tpon	228	228	228	days
Perpendicular from well to stream	a	23000	23000	23000	ft
Well depth	d	57	57	57	ft
Aquifer hydraulic conductivity	K	12000	12000	12000	ft/day
Aquifer saturated thickness	b	33	33	33	ft
Aquifer transmissivity	T	396000	396000	396000	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	5	5	5	ft/day
Aquitard saturated thickness	ba	14	14	14	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.25	0.25	0.25	
Stream width	ws	90	90	90	ft
Streambed conductance (lambda)	sbc	150.000000	150.000000	150.000000	ft/day
Stream depletion factor	sdf	1.335859	1.335859	1.335859	days
Streambed factor	sbf	8.712121	8.712121	8.712121	
input #1 for Hunt's Q_4 function	t'	0.748582	0.748582	0.748582	
input #2 for Hunt's Q_4 function	K'	477.092352	477.092352	477.092352	
input #3 for Hunt's Q_4 function	epsilon'	0.004000	0.004000	0.004000	
input #4 for Hunt's Q_4 function	lamda'	8.712121	8.712121	8.712121	

Figure 3: Results of the Hunt (2003) model were used to assess potential impacts to the Malheur River to the north.

MALH 54129 MALH 54129

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 112759
START CARD # 1022731

(1) LAND OWNER Owner Well I.D.
First Name George Last Name Iida
Company
Address 580 Railroad Ave.
City Ontario State OR Zip 97914

(2) TYPE OF WORK [X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD
[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud [ ] Reverse Rotary [ ] Other

(4) PROPOSED USE [ ] Domestic [X] Irrigation [ ] Community [ ] Industrial/ Commerical [ ] Livestock [ ] Dewatering [ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION Special Standard [ ] Attach copy
Depth of Completed Well 57 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
16	0	57	Bentonite Chips	0	19	37	S

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other Slow pour from top
Backfill placed from ft. to ft. Material
Filter pack from 19 ft. to 57 ft. Material Gravel Size 3/8
Explosives used: [ ] Yes Type Amount 3 Yards

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
◉	○	12	X	2	20	250	◉	○	X	
◉	○	12		40	57	250	◉	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)
Temp casing [X] Yes Dia 16 From 0 To 35

(7) PERFORATIONS/SCREENS
Perforations Method
Screens Type Wire Wrap Material SS

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Screen		12	20	40	04			

(8) WELL TESTS: Minimum testing time is 1 hour
(●) Pump ( ) Bailer ( ) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
375	35	45	1

Temperature 58 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County MALHEUR Twp 18 S N/S Range 47 E E/W WM
Sec 20 NE 1/4 of the NE 1/4 Tax Lot 2600
Tax Map Number Lot
Lat ° ' " or 43.995655 DMS or DD
Long ° ' " or -116.985632 DMS or DD
( ) Street address of well (●) Nearest address
1/2 Mile East of 201 on Railroad Ave

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening				
Completed Well	05-07-2014			8.5

Flowing Artesian? [ ] Dry Hole? [ ]
WATER BEARING ZONES Depth water was first found 19

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
05-07-2014	19	42	300			8.5

(11) WELL LOG Ground Elevation

Material	From	To
Topsoil	0	5
Clayey Soil	5	19
Sand and Gravel	19	42
Cemented Pea Gravel & Sand	42	57

RECEIVED BY OWRD
JUN 1 4 2014
SALEM, OR

Date Started 04-17-2014 Completed 05-07-2014

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, 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.
License Number Date
Password : (if filing electronically) JUN 09 2014
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, 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.
License Number 1714 Date 05-09-2014
Password (if filing electronically)
Signed Dave Iglesias
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK
Form Version 0 95