

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date 3 December 2009

FROM: Ground Water/Hydrology Section Gerald H. Grondin
Reviewer's Name

SUBJECT: Application G- 17265 Supersedes review of None
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 ground water 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: Brad & Connie Mastre County: Harney

A1. Applicant(s) seek(s) (2500 gpm) 5.57 cfs from 2 well(s) in the Malheur Lakes Basin,
North Basin watershed in Harney-Malheur Lakes subbasin Quad Map: Ninemile Slough

A2. Proposed use: Irrigation (primary 320.0 acres) Seasonality: 1 March – 31 October (245 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	Not drilled	1	Basin Fill	2.79	23S/32E-sec 36 DDD	304' N, 264' W fr SE cor S 36
2	Not drilled	2	Basin Fill	2.79	23S/32E-sec 36 DCB	840' N, 2640' W fr SE cor S 36
3						
4						

* 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	4121	Prop 300	Prop 50		Prop 350	Prop 20	Prop 0-300	?	Prop 200-250	Prop 1250		
2	4123	Prop 300	Prop 50		Prop 350	Prop 20	Prop 0-300	?	Prop 200-250	Prop 1250		

Use data from application for proposed wells.

A4. Comments: _____

The proposed rate of 5.57 cfs (2500 gpm) total is more than the 1/80 cfs per acre typically allowed. For 320 acres, the typical maximum rate is 4.00 cfs (1795 gpm) total.

The proposed wells will likely produce ground water from basin fill sediments.

A5. Provisions of the Malheur Lake Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water are, or are not, activated by this application. (Not all basin rules contain such provisions.)

Comments: OAR 690-512 is not activated given the surface water drainages are identified as seasonal, intermittent.

A6. Well(s) # N.A., _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: _____

Comments: Currently, no administrative area.

B. GROUND WATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. Based upon available data, I have determined that ground water* 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 ground water 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 ground water 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 ground water resource; or
- d. will, if properly conditioned, avoid injury to existing ground water rights or to the ground water resource:
 - i. The permit should contain condition #(s) 7B, 7F, 7N;
 - 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 ground water production from no deeper than _____ ft. below land surface;
- b. Condition to allow ground water production from no shallower than _____ ft. below land surface;
- c. Condition to allow ground water production only from the _____ ground water 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 Ground Water 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. Ground water availability remarks: Recommend conditions 7B, 7F, and 7N

The proposed well sites are located within Harney Valley in an area southeast of Burns, about 7 miles southeast of the Burns airport. It is within the North Basin watershed of the Harney-Malheur Lakes sub-basin. The area is surficially mapped as Qal by Piper and others (1939), Qal by Leonard (1970), and Qs by Greene and others (1972).

Available data, including Piper and others (1939), Leonard (1970), and water well reports indicate ground water in the basin fill is generally unconfined and hydraulically connected to Malheur and Harney Lakes. Some local confinement can occur where discontinuous low permeability layers are present. Leonard (1970) indicates confined ground water occurs at depth in the basin in deep basin fill sediments and underlying Tertiary volcanic and sedimentary rocks. Hubbard (1975) indicates the ground water contribution to flow into Malheur Lake is small with the lake perched above ground water in most areas.

There is a general and increasing local about ground water availability in the Harney Valley.

The closest wells with ground water level trend data are HARN 440 and HARN 441 located less than 50 feet apart and are about 8 miles northwest of the proposed wells. The 120 foot deep HARN 440 represents shallower ground water and the 561 foot deep HARN 441 represents deeper ground water conditions. The ground water level at HARN 440 is generally higher and seasonally fluctuates much less than at HARN 441. No long term decline is apparent. Other wells with ground water level data are located more than 12 miles southeast of the proposed wells and are distributed north-south on each side of Crane-Buchanan Road. They include HARN 1046 and HARN 50751 in township T24S/R33E, HARN 1061, HARN 1067, and HARN 1065 in township T24S/R34E, and HARN 1245 in township T25S/R34E. They all show annual ground water level declines. They are located within a ground water sub-area Leonard (1970) distinguished as the “East-Side Subarea” where ground water was identified as limited and in need of monitoring for overdevelopment. The proposed wells are on the west side of an adjoining sub-area Leonard (1970) distinguished as the “Central-Valley Subarea”. The two sub-areas are likely hydraulically connected, but how and whether the ground water level trends within “East-Side Subarea” extend to the west side of the “Central-Valley Subarea” is currently uncertain. It needs to be monitored.

C. GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	Basin fill sediments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Basin fill sediments	<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"/>

Basis for aquifer confinement evaluation: _____

Available data, including Piper and others (1939), Leonard (1970), and water well reports indicate ground water in the basin fill is generally unconfined and hydraulically connected to Malheur and Harney Lakes. Some local confinement can occur where discontinuous low permeability layers are present. Leonard (1970) indicates confined ground water occurs at depth in the basin in deep basin fill sediments and underlying Tertiary volcanic and sedimentary rocks. Hubbard (1975) indicates the ground water contribution to flow into Malheur Lake is small with the lake perched above ground water in most areas.

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	Ninemile Slough	4108	4119	3000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Embree Slough-Silvies River E Fk	4108	4119	25500	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	3	Malheur & Harney Lakes	4108	4098	52700	<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"/>
2	1	Ninemile Slough	4108	4119	4400	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Embree Slough-Silvies River E Fk	4108	4119	23400	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	3	Malheur & Harney Lakes	4108	4098	53800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: _____

The ground water elevation for the proposed wells was obtained from Leonard (1970), the ground water level measured at a well located at T24S/R32E-sec 1 ADA which is the closest well to the proposed wells. The elevation is higher than the ground water level contours on the map found in Piper and others (1939).

Ninemile Slough is identified as seasonal, intermittent. The nearest reaches appear to be perched above ground water.

Embree Slough-East Fork Silvies River are identified as perennial. The nearest reaches appear to be perched above ground water.

Malheur Lake is the basin outlet for ground water flow (through evaporation). The lake elevation above is for 1983 obtained from USGS 1:24,000 quadrangle maps. Maps in Greene and others (1972) and Leonard (1979) show a lake elevation of 4085 feet. The distance is to the 1983 shoreline. The shoreline location can significantly vary. Hubbard (1975) indicates the ground water contribution to flow into Malheur Lake is small with the lake perched above ground water in most areas.

Water Availability Basin the well(s) are located within: NINEMILE SL > MALHEUR SL - AT MOUTH
W FK SILVIES R . MALHEUR L - AT MOUTH
No WAB for Harney & Malheur Lakes

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?
		<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"/>
		<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"/>
			<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: _____

The distance from the proposed wells to Ninemile Slough is less than 1 mile. However, ground water is not considered hydraulically connected to the slough which is identified as seasonal, intermittent despite water availability estimates for all 12 months. The nearest reaches appear perched above ground water.

The distance from the proposed wells to Embree Slough-East Fork Silvies River and to Malheur and Harney Lakes is more than 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
		%	%	%	%	%	%	%	%	%	%	%	%
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													
		%	%	%	%	%	%	%	%	%	%	%	%
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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: _____

The distance from the proposed wells to Embree Slough-East Fork Silvies River and to Malheur and Harney Lakes is more than 1 mile.

This analysis was not done for Embree Slough-East Fork Silvies River given ground water is not considered hydraulically connected. The reaches of concern appear to be perched above ground water.

This analysis was not done for Malheur and Harney Lakes given there is no WAB for Malheur and Harney Lakes.

Drawdown at Malheur and Harney Lakes was estimated using the Theis drawdown equation. The calculations used a transmissivity of 1,100 ft²/day which is at the lower end of the 1,000 to 15,000 ft²/day transmissivity range for Eastern Oregon basin fill noted by Gonthier (1985). The value used was derived from specific capacity data from irrigation wells in adjoining sections: HARN 659, HARN 885, and HARN 886. Additionally, the calculation used an assumed intermediate storage coefficient (0.001).

The estimated drawdown for both continuous pumping at the full proposed rate and for a lower pro-rated pumping rate for 245 days was less than 0.80 and 0.70 feet respectively.

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 ground water 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: _____

Recommend conditions 7B, 7F, and 7N

The proposed well sites are located within Harney Valley in an area southeast of Burns, about 7 miles southeast of the Burns airport. It is within the North Basin watershed of the Harney-Malheur Lakes sub-basin. The area is surficially mapped as Qal by Piper and others (1939), Qal by Leonard (1970), and Qs by Greene and others (1972).

Available data, including Piper and others (1939), Leonard (1970), and water well reports indicate ground water in the basin fill is generally unconfined and hydraulically connected to Malheur and Harney Lakes. Some local confinement can occur where discontinuous low permeability layers are present. Leonard (1970) indicates confined ground water occurs at depth in the basin in deep basin fill sediments and underlying Tertiary volcanic and sedimentary rocks. Hubbard (1975) indicates the ground water contribution to flow into Malheur Lake is small with the lake perched above ground water in most areas.

There is a general and increasing local about ground water availability in the Harney Valley.

The closest wells with ground water level trend data are HARN 440 and HARN 441 located less than 50 feet apart and are about 8 miles northwest of the proposed wells. The 120 foot deep HARN 440 represents shallower ground water and the 561 foot deep HARN 441 represents deeper ground water conditions. The ground water level at HARN 440 is generally higher and seasonally fluctuates much less than at HARN 441. No long term decline is apparent. Other wells with ground water level data are located more than 12 miles southeast of the proposed wells and are distributed north-south on each side of Crane-Buchanan Road. They include HARN 1046 and HARN 50751 in township T24S/R33E, HARN 1061, HARN 1067, and HARN 1065 in township T24S/R34E, and HARN 1245 in township T25S/R34E. They all show annual ground water level declines. They are located within a ground water sub-area Leonard (1970) distinguished as the "East-Side Subarea" where ground water was identified as limited and in need of monitoring for overdevelopment. The proposed wells are on the west side of an adjoining sub-area Leonard (1970) distinguished as the "Central-Valley Subarea". The two sub-areas are likely hydraulically connected, but how and whether the ground water level trends within "East-Side Subarea" extend to the west side of the "Central-Valley Subarea" is currently uncertain. It needs to be monitored.

Ground water is not considered hydraulically connected to Ninemile Slough which is identified as seasonal, intermittent despite water availability estimates for all 12 months. The nearest reaches appear perched above ground water.

Ground water is not considered hydraulically connected to Embree Slough-East Fork Silvies River which are identified as perennial. The nearest reaches appear to be perched above ground water.

Malheur Lake is the basin outlet for ground water flow (through evaporation). The shoreline location can significantly vary. Hubbard (1975) indicates the ground water contribution to flow into Malheur Lake is small with the lake perched above ground water in most areas.

References Used:

Oregon Administrative Rules: OAR 690-512

Piper, A.M., Robison, T.W., and Park C.F. 1939. Geology and Ground Water Resources of the Harney Basin, Oregon. USGS Water Supply Paper 841.

Leonard, A.R. 1970. Ground-Water Resources in Harney Valley, Harney County, Oregon. Ground Water Report 16, Oregon Water Resources Department, Salem, Oregon.

Greene, R.C., Walker, G.W., and Corcoran, R.E. 1972. Geologic Map of the Burns Quadrangle, Oregon. USGS Miscellaneous Geologic Investigations Map I-680.

Hubbard, Larry. L. 1975. Hydrology of Malheur Lake, Harney County, Southeastern Oregon. USGS Water Resources Investigation 75-21.

Walker, G.W. 1979. Revisions to the Cenozoic Stratigraphy of Harney Basin, Southeastern Oregon. USGS Bulletin 1475.

Gonthier, J.B. 1985. A Description of Aquifer Units in Eastern Oregon. USGS Water Resources Investigations Report 84-4095.

OWRD water well reports and/or hydrographs: HARN 440, HARN 441, HARN 1046, HARN 50751, HARN 1061, HARN 1067, HARN 1065, HARN 1245, HARN 885, and HARN 886

D. WELL CONSTRUCTION, OAR 690-200

D1. Well(s) #: 1 and 2 Logid: Both wells are not drilled yet

D2. **THE WELL does not 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:**

- a. constitutes a health threat under Division 200 rules;
- b. commingles water from more than one ground water reservoir;
- c. permits the loss of artesian head;
- d. permits the de-watering of one or more ground water reservoirs;
- e. other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

- D5. **THE WELL**
- a. was, or was not constructed according to the standards in effect at the time of original construction or most recent modification.
 - b. I don't know if it met standards at the time of construction.

Remark: _____

D6. **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

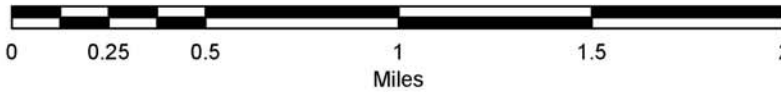
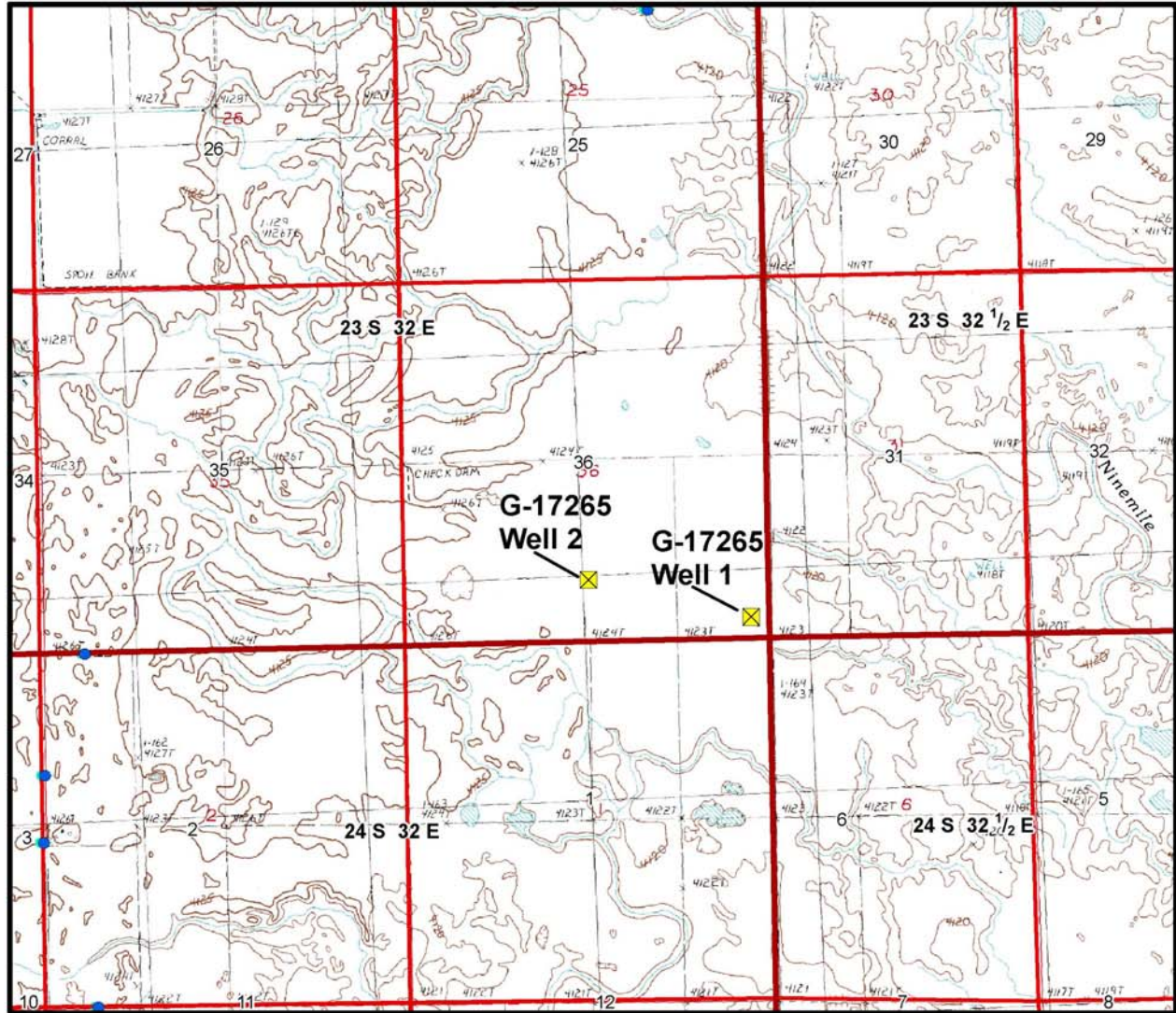
D7. Well construction deficiency has been corrected by the following actions: _____

_____, 200____.

(Enforcement Section Signature)

D8. **Route to Water Rights Section (attach well reconstruction logs to this page).**

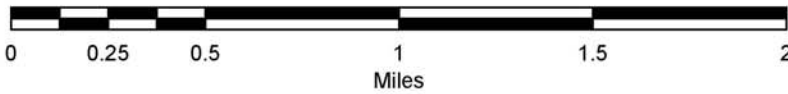
Water Right Application G-17265 Brad & Connie Mastre



Yellow = Proposed Wells
Red = Proposed or Existing Wells for Other Rights
Other Colors = Surface Water Diversions



Water Right Application G-17265 Brad & Connie Mastre



Yellow = Proposed Wells
Red = Proposed or Existing Wells for Other Rights
Other Colors = Surface Water Diversions

