

Approved:



MEMO

To: Kristopher Byrd, Well Construction Section Manager
From: Tommy Laird, Well Construction Program Coordinator
Subject: Review of Water Right Application LL-1947
Date: August 8, 2023

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Darrick Boschmann reviewed the application. Please see Darrick's Groundwater Review.

Applicant's Well #1 (Proposed Well): Applicant's Well #1 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

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

Applicant's Well #2 (Proposed Well): Applicant's Well #2 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of applicant's proposed Well #2 may not satisfy hydraulic connection issues.

Groundwater Application Review Summary Form

Application # LL- 1947

GW Reviewer Darrick E. Boschmann Date Review Completed: 05/08/2023

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.

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).

WATER RESOURCES DEPARTMENT

MEMO

05/08/2023

TO: Application LL - 1947

FROM: GW: Darrick E. Boschmann
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES The source of appropriation is hydraulically connected to a State Scenic
☒ NO Waterway or its tributaries

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

☐ 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 [Enter] 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 05/08/2023
 FROM: Groundwater Section Darrick E. Boschmann
 Reviewer's Name
 SUBJECT: Application **LL - 19147** 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: Solv Energy, LLC County: Lake

A1. Applicant(s) seek(s) 0.45 cfs from 2 well(s) in the Goose & Summer Lake Basin,
Summer Lake (Fort Rock Valley) subbasin

A2. Proposed use General Construction or Maintenance* Seasonality: Year-Round

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

We ll	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	Proposed	1	Main GW Reservoir	0.45	26.00S-16.00E-9-NE NE	660 FEET SOUTH AND 640 FEET WEST FROM NE CORNER, SECTION 9
2	Proposed	2	Main GW Reservoir	0.45	26.00S-16.00E-21-NW NE	890 FEET SOUTH AND 1410 FEET WEST FROM NE CORNER, SECTION 21
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	4325	NA	NA	NA	1000	0-18.5	+2-18.5	none	none	NA	NA	NA
2	4322	NA	NA	NA	1000	0-18.5	+2-18.5	none	none	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** _____

The proposed wells are located in Fort Rock Valley (Fort Rock classified area), about 8 miles northwest of the unincorporated community of Christmas Valley. The area immediately underlying the proposed wells was mapped by Walker and others (1967) as Qs (lacustrine, fluvialite, and aeolian tuffaceous sedimentary rocks, some ash-fall deposits, an ash flow tuff on northwest edge of area, and unconsolidated ash, pumice, clay, sand, silt, and gravel). These sedimentary deposits are underlain at variable depth by QTb (Basalt flows) and/or Tsb (tuffaceous sandstone, siltstone, conglomerate, ash-flow deposits, tuff, and interbedded basalt or andesite flows) (Walker and others, 1967).

Groundwater in the Fort Rock Valley-Christmas Valley area (Fort Rock Classified Area) is identified as a single groundwater system. Groundwater is found in both a shallower predominantly basin-fill sediment unit and a deeper predominantly volcanic rocks and sediments unit below. The predominantly basin fill sediment unit and the predominantly volcanic rocks and sediment unit both readily yield groundwater, and the two units are hydraulically connected.

Miller (1986) describes the groundwater source as the main groundwater reservoir. That reservoir includes groundwater in different geologic units. The reservoir has three characteristics. First, the "natural" groundwater level changes less than 1.5 feet annually, indicating the system is highly modulated. Second, the 1980s potentiometric surface was approximately 4292 feet elevation amsl basin-wide with Silver Lake an exception. Third, the reservoir consists of numerous water producing zones in several formations, all having an essentially common potentiometric level, and all being very transmissive in general.

*The application lists the proposed source aquifer as "basalt". The most likely aquifer given the proposed well construction is the "main groundwater reservoir" of the Fort Rock Basin (Miller, 1986), which is classified under OAR 690-513-0060(2)(n).

This application proposes mitigation by forbearance of certificate 91585 (specifically a 36.1 acre portion of irrigation use – the rate being 0.45 cfs, the volume being 108.3 acre-feet per year).

Note: This review does not evaluate the viability of the mitigation by forbearance proposal, the change of use from seasonal irrigation to year-round construction/maintenance use*, or the associated rate/duty conversion.

*The intended uses of water listed on the application include road construction or maintenance, general construction, dust control, soil management, fire suppression, re-seeding, and re-vegetation.

- A5. ☒ **Provisions of the** Goose and Summer Lakes 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 wells would produce groundwater from the "main ground water reservoir" of the Fort Rock Basin.

690-513-0060(2)(n) Ground water from the main ground water reservoir of the Fort Rock Basin is classified for stockwater, watering any lawn or noncommercial garden not exceeding one-half acre in area, watering any lawn or noncommercial garden not exceeding three acres in area for public uses, quasi-municipal, single or group domestic, down-hole heat exchange, industrial, and commercial uses only.

- A6. ☒ **Well(s) #** 1 , 2 , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: **Fort Rock Classified Area**

Comments: _____

The proposed wells would produce groundwater from the "main ground water reservoir" of the Fort Rock Basin. The proposed uses are not explicitly listed as a classified use for the "main ground water reservoir" of the Fort Rock Basin.

*The intended uses of water listed on the application include road construction or maintenance, general construction, dust control, soil management, fire suppression, re-seeding, and re-vegetation.

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; 7K; 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 _____ 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:** _____

17 active State Observations wells are monitored in the Fort Rock Classified Area, indicating that groundwater levels in the have been declining about 0.25 to 0.5 feet per year since 1985 (see hydrograph below). However, the available water level record does not meet the Division 8 definition of excessively declining or declined excessively (for the storage portion of the source of water to wells).

The nearest authorized groundwater POD to the proposed wells is approximately 0.5 miles away. Any seasonal interference would be unlikely to meet the standard for substantial or undue interference.

The proposed POA locations are within the Fort Rock Classified Groundwater area (OAR 690-513-0060 (2)(n) where ongoing declines have been occurring since the early 1980s due to the groundwater resource capacity being exceeded. The proposed use would exacerbate the groundwater capacity exceedance problem. Additional groundwater development in this area will contribute to the ongoing declines. Therefore, the new use is found to be not within the capacity of the resource as defined in OAR 690-400-0010**.

**Note: This review does not evaluate the viability of the mitigation by forbearance proposal, the change of use from seasonal irrigation to year-round construction/maintenance use*, or the associated rate/duty conversion.

If a permit is issued the following conditions are recommended:

7N Static Water Level Condition

7K Well Construction Condition: The proposed wells shall be constructed to develop groundwater only from the predominantly volcanic rocks and sediments unit underlying the predominantly basin-fill sediment unit. The wells shall be continuously cased and continuously sealed a minimum of five (5) feet into the predominantly volcanic rocks and sediments unit. The wells may not be completed in such a manner that they allow groundwater to be developed from the overlying predominantly basin fill sediment unit. If any alternative from this well construction requirement is proposed, the permittee shall contact the Department Groundwater Section to request approval of such construction. The request shall be in writing and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the well is constructed first and then the request made, the requested modification will not be approved. If approved, the new well construction specifications will be incorporated into any certificate issued for this permit.

Medium 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	Main GW Reservoir	☒	☐
2	Main GW Reservoir	☒	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: _____

Miller (1986) describes groundwater in the “main groundwater reservoir” as occurring under both confined and unconfined conditions. It is likely that confined to semi-confined conditions will be encountered at the proposed depth.

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 (mi)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Paulina Marsh	4282	4314	>10	☒	☐	☐	☐	☒
2	1	Paulina Marsh	4282	4314	>10	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: _____

Groundwater in the alluvium and basin-fill overlying the deposits comprising the “main ground water reservoir of the Fort Rock Basin” is in hydraulic connection with surface water given shallower static groundwater elevations are similar to surface water elevations. Additionally, groundwater in the alluvium and basin-fill is in hydraulic connection (downward gradient) with groundwater within the deposits comprising the “main ground water reservoir of the Fort Rock Basin” meaning all groundwater in the area is in hydraulic connection with surface water.

The groundwater elevation cited above is from the May 2017 static water level measured at LAKE 504. Although the hydraulic gradient between the proposed wells and Paulina Marsh is away from the marsh, this does not preclude a finding of hydraulic connection in this situation. Note that Millers 1986 plate also appears to indicate groundwater flow from the marsh toward the location of the proposed wells.

Water Availability Basin the well(s) are located within: No WAB data available.

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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 #		Q _w > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Q _w > 1% ISWR?	80% Natural Flow (cfs)	Q _w > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: _____

C3a./C3b. This section does not apply.

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	1	%	%	%	%	%	%	%	%	%	%	%	%
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													
(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: _____

No evaluation here. Given the great distance between the proposed wells and the surface water source interference will be well under the threshold for PSI under this section. Additionally, no WAB data is available.

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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** _____

C1. 690-09-040 (1)

It is determined that all wells will produce water from a confined to semi-confined aquifer.

C2. 690-09-040 (2) (3)

It is determined that all wells are hydraulically connected with Paulina Marsh.

C3a./C3b. 690-09-040 (4)

This section does not apply. The proposed wells are located greater than 1 mile from Paulina Marsh

C4a. 690-09-040 (5)

No analysis here given the great distance between the proposed wells and Paulina Marsh.

If a permit is issued, the following conditions are recommended:

7N Static Water Level Condition

7K Well Construction Condition: The proposed wells shall be constructed to develop groundwater only from the predominantly volcanic rocks and sediments unit underlying the predominantly basin-fill sediment unit. The wells shall be continuously cased and continuously sealed a minimum of five (5) feet into the predominantly volcanic rocks and sediments unit. The wells may not be completed in such a manner that they allow groundwater to be developed from the overlying predominantly basin fill sediment unit. If any alternative from this well construction requirement is proposed, the permittee shall contact the Department Groundwater Section to request approval of such construction. The request shall be in writing and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the well is constructed first and then the request made, the requested modification will not be approved. If approved, the new well construction specifications will be incorporated into any certificate issued for this permit.

Medium Water Use Reporting

References Used: _____

Walker, G.W., Peterson, N.V., Greene, R.C., 1967. Reconnaissance geologic map of the east half of the Crescent quadrangle, Lake, Deschutes, and Crook Counties, Oregon. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-493. Scale 1:250,000.

Miller, D.W., 1986. Ground water conditions in the Fort Rock Basin, Northern Lake County, Oregon. Oregon Water Resources Department Ground Water Report No. 31.

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) _____

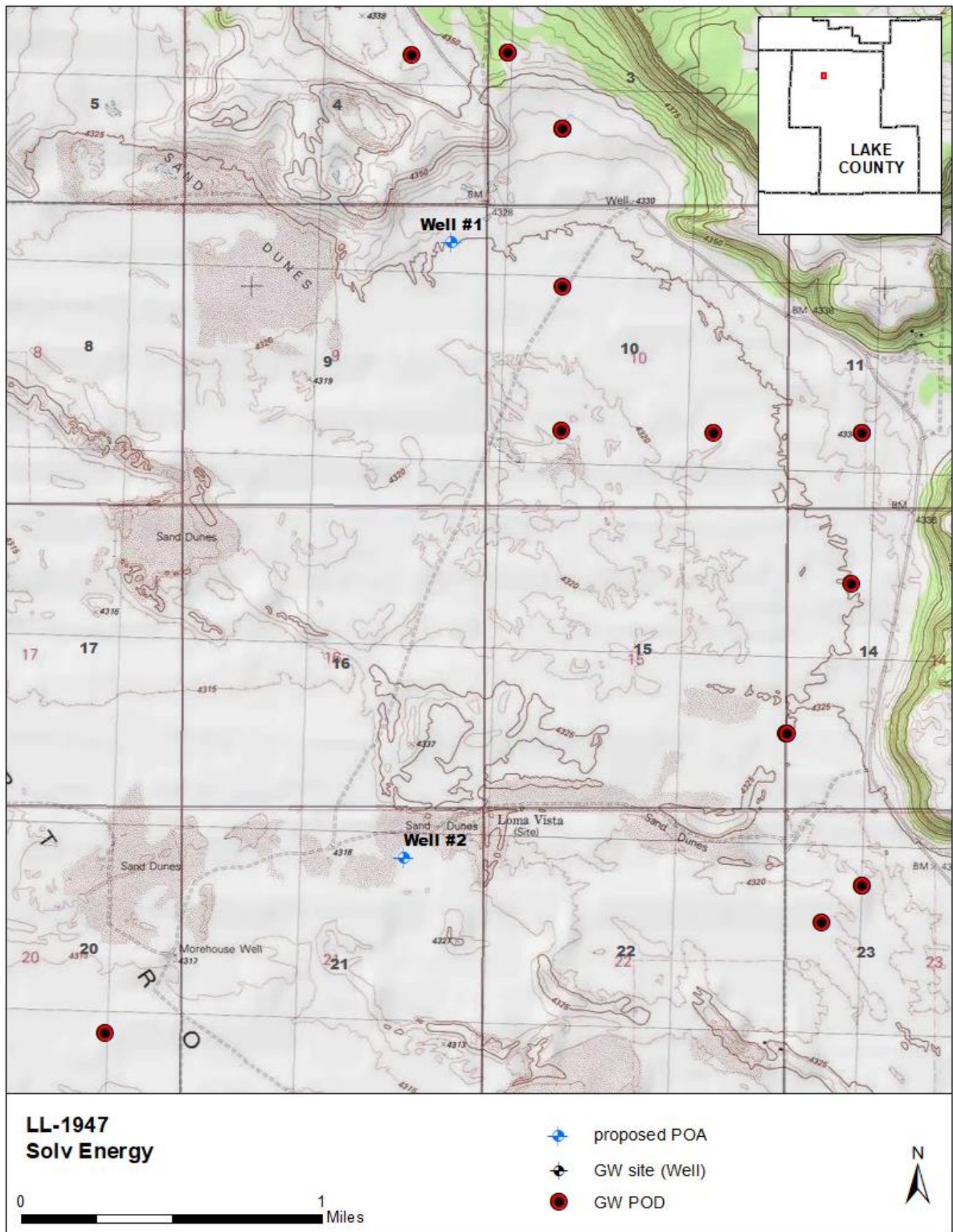
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

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

Water Availability Tables

No WAB data available.

Well Location Map



Water-Level Measurements in Nearby Wells