

**BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON**

In the Matter of Aquifer Storage and Recovery)
(ASR) Limited License Application #020,)
Umatilla County

ORDER APPROVING
RENEWED ASR TESTING

AUTHORITY

Oregon Revised Statute (ORS) 537.534 and Oregon Administrative Rule (OAR) 690-350-0020 establish the process by which an application for ASR testing under an ASR limited license may be submitted and approved. Oregon Administrative Rule (OAR) 690-350-0010 describes general provisions for ASR under Oregon law.

BACKGROUND

Madison Farms began ASR testing under ASR LL #007 in 2003 and expanded testing under ASR LL #014. On April 17, 2013, the Department issued ASR Limited License #020 from Madison Farms. That license authorized ASR testing for five years at up to two wells in a Columbia River Basalt Group aquifer. Condition 1 of ASR Limited License #020 provides for renewal pursuant to OAR 690-350-0020(5)(c), and describes the following terms for renewal: The limited license may be renewed if the licensee demonstrates to the Director's satisfaction that further testing is necessary and that the licensee complied with the terms of the license.

FINDINGS OF FACT

1. On December 20, 2017, Madison Farms submitted a request for a five-year renewal for ASR Limited License #020.
2. The Department provided public notice of the application in the Department's weekly public notice on December 26, 2017. A 30-day comment period followed.
3. The Department received no public comments related to the possible issuance of an ASR limited license.
4. The Department sought comments and recommendations from Oregon Department of Environmental Quality (DEQ) and Oregon Health Authority Drinking Water Program (OHA) related to the possible issuance. Comments were received from DEQ and OHA supporting the issuance of ASR LL #020.
5. The Department evaluated the application and comments and determined the proposed use is consistent with Condition 1 of the ASR Limited License and OAR 690-350-0020(5)(c). The licensee has demonstrated to the Director's satisfaction that further testing is necessary and that the licensee complied with the terms of the limited license. The request presented reasons for the renewal and also provided specific details that addressed compliance with the ASR limited license.

CONCLUSIONS OF LAW

The request to renew ASR Limited License #020 for five years is consistent with the requirements of OAR 690-350-0020(5)(c) and Condition 1 of ASR Limited License #020.

ORDER

Now, THEREFORE, it is ORDERED, ASR Limited License #020 shall be valid through the fifth anniversary of its renewal, pursuant to ORS 537.534 and OAR 690-350-0020(5)(c), and Condition 1 of the original ASR limited license.

Except as modified by other provisions of this license, the licensee is authorized to pursue the project schedule, monitoring, and other features noted in the ASR pilot test work plan dated October 8, 2012. That plan may be amended and approved pursuant to condition (4)(A)(iii). The project schedule in the ASR test plan may be reasonably adjusted by the licensee to reflect the license issuance date or other delays. Features of that ASR testing plan are provided in the application documents entitled:

Madison Farms Aquifer Storage and Recovery (ASR)
Limited License Application Supplemental Information and Testing Plan
Prepared by GSI Water Solutions, Inc.
October 8, 2012

Response to OWRD, DEQ, and OHA-DWP Comments on Madison Farms
Aquifer Storage and Recovery (ASR) Limited License Application
Prepared by GSI Water Solutions, Inc.
January 25, 2013

Madison Ranches request for a 5-year renewal of ASR Limited License #020:
Addendum to revise water quality monitoring plan
Prepared by GSI Water Solutions, Inc.
March 8, 2018

ASR testing must provide data and analysis that address the following: the appropriate target storage volume; loss of stored ASR water and natural water by virtue of ASR activities; water quality changes due to ASR activities; well construction sufficiency for ASR purposes; water level response in the ASR wells, aquifer, springs and nearby wells; accounting of ASR inputs, withdrawals, and storage; water quality testing needs; and well hydraulics at the ASR wells.

The licensee may divert up to 6,000 gallons per minute (gpm) from one alluvial well near Butter Creek, a tributary of the Umatilla River. This diversion may occur under Certificates 75107, 83692, and 83693; any order under T-11414, and any current LL for AR Recovery Testing held by Madison Farms authorizing recovery at the same alluvial well. The diversion rate shall not exceed the total diversion rate authorized for those sources.

The source water well (UMAT 57869) is located at 1,620 feet South, 1,060 feet West from North $\frac{1}{4}$ corner of Section 31, T3N/R28E.

The licensee may store up to 5,049 acre-feet (1.65 billion gallons) in a basalt aquifer. With the authorization of individual ASR well test plans, up to 2 injection wells are potentially authorized. The maximum combined injection rate is 6,000 gpm. The maximum combined recovery rate is 6,000 gpm at the same 2 wells. The maximum storage duration is the five-year duration of this license.

The ASR wells are located as follows:

<i>Well Name</i>	<i>Well Location</i>
UMAT 1166	50 feet North, 1270 feet West from the SE corner of Section 25, T3N/R27E
Proposed ASR	2050 feet South and 1530 feet East of NW corner of Section 31, T3N/R28E

Other Conditions:

- 1) **License Renewal.** The license may be renewed if the licensee demonstrates to the Director's satisfaction that further testing is necessary and that the licensee complied with the terms of the license.
- 2) **Notice Prior to Injection and Recovery.** The licensee shall give notice, in writing, to the watermaster not less than 15 days in advance of either initiating any injection under the license or recovering stored water. The injection notice shall include the license number, the location of the injection source water diversion, the quantity of water to be diverted from that source, the time of injection, and the place of injection. The recovery notice shall include the license number, the location of the recovery well(s), the time of recovery, and the quantity of water to be recovered.
- 3) **Record of Use.** The licensee shall maintain a record of injection and recovery, including the total number of hours and times of injection and recovery, the total metered quantity injected and recovered and metered power to the well pump. The record of use may be reviewed by Department staff upon request. The licensee shall track this information on a form available from the Department.
- 4) **Modification/Revocation.** The Department shall notify the licensee in writing and allow the licensee to respond when considering the following actions:
 - (A) The Director may modify the ASR license for any of the following reasons:
 - (i) to reflect changes in Oregon Health Authority Drinking Water Program (OHA) and Oregon Department of Environmental Quality (DEQ) water quality or treatment standards;
 - (ii) to address needed technological changes as requested by DEQ or OHA to minimize constituents regulated under OAR 333-61-030 (ORS 448.131 and .273) or OAR 340-40 (ORS 468B.165);
 - (iii) upon written request from the applicant for minor adjustments to the authorization in the license.
 - (B) The Director may revoke, suspend or modify the ASR license for any of the following reasons:
 - (i) to prevent or mitigate injury to other water rights, instream water rights, minimum perennial streamflows or aquifer water quality;
 - (ii) to address any other unintended, injurious effects of the ASR activity; or

(iii) failure to maintain compliance with all conditions of this license.

(C) The Department may offer an additional public comment opportunity consistent with the notice and comment provisions of OAR 690-350-020 prior to modifying the license.

- 5) **Priority/Protection.** This license does not receive a priority date and is not protected under ORS 540.045. The diversion of water for this ASR testing under the authority of Certificates 75107, 83692, and 83693; T-11414, and any current LL for AR Recovery Testing retain the priority dates and protections of those water rights.
- 6) **Compliance with Other Laws.** The injection of acceptable water into the aquifer as well as its storage and recovery under this license shall comply with all applicable local, state or federal laws. This shall include but not be limited to compliance with the Oregon Department of Environmental Quality's Underground Injection Control registration program as authorized under the Safe Drinking Water Act (40 CFR 144.26). Also, all pilot test discharges to waterways must be covered by a DEQ National Pollution Discharge Elimination System (NPDES) permit.
- 7) **Water Quality Conditions and Limits.**
 - (A) The licensee shall minimize, to the extent technically feasible, practical and cost-effective, the concentration of constituents in the injection source water that are not naturally present in the aquifer;
 - (B) Except as otherwise provided in (C) of this condition, if the injection source water contains constituents regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-40 (ORS 468B.165) that are detected at greater than 50 percent of the established levels (MCLs or MMLs in the cited rules), the licensee shall employ technically feasible, practical and cost-effective methods to minimize concentrations of such constituents in the injection source water;
 - (C) Constituents that have a secondary contaminant level or constituents that are associated with disinfection of the injection source water may be injected into the aquifer up to the standards established under OAR 333-61-030 (ORS 448.131 and 448.273);
 - (D) The Department may, based upon valid scientific data, further limit certain constituents in the injection source water if the Department finds that those constituents will interfere with or pose a threat to the maintenance of the water resources of the state for present or future beneficial uses;
 - (E) If during the course of ASR testing, a constituent which is regulated under OAR 333-61-030 (ORS 448.131 and .273) or OAR 340-40 (ORS 468B.165) is detected above the 50% level prescribed in condition (7)(B) or the 100% level prescribed in condition (7)(C) or the level prescribed in condition (9)(A), the licensee shall immediately stop injection activities upon receipt of lab data and notify the Department within five days. Injection may recommence after constituent levels return to acceptable levels pursuant to (B) or (C) of this condition or condition (9)(A).
- 8) **Water Quality Monitoring.** The licensee shall sample and analyze water quality in the manner described in the current, approved ASR work plan.

9) **Nitrate Monitoring Program.**

(A) The maximum concentration of nitrate in the injection source water shall not exceed 9.5 mg/l.

(B) Nitrate monitoring using a nitrate meter will be performed in accordance with the following guidelines:

(i) Licensee shall calibrate the nitrate meter in accordance with manufacturer's recommendation.

(ii) Licensee shall collect and submit a recharge water sample for nitrate testing by a laboratory weekly during the first two weeks of the injection cycle. Lab testing may be discontinued for the duration of the injection cycle unless the on-site meter results indicate that injection water nitrate concentrations are equal to or greater than 7.0 mg/L. Weekly lab tests would then be required as a verification measure until nitrate concentrations dropped below 7.0 mg/L.

(iii) Licensee shall measure and store nitrate concentrations of recharge water using the field instrument at a frequency of once per hour during the recharge period.

(iv) Licensee shall compare field nitrate measurements to laboratory measurements to check the accuracy and precision of the field instrument. If the allowable variation exceeds the upper limit established in Groundwater Solutions' September 2004 report "Nitrate Meter Accuracy and Precision Evaluation for Madison Farms ASR Limited License #007" for two consecutive weekly comparisons between the nitrate meter and laboratory results, the deviation will be corrected. If the laboratory measured nitrate concentrations are greater than 8.5 mg/l, the recharge will be immediately terminated until the deviation between the field and laboratory measurements is corrected.

(C) Licensee shall program the nitrate monitoring instrumentation to automatically shut down recharge if the nitrate concentration exceeds 9.5 mg/l.

(D) If recharge is shut down by an exceedance of the nitrate criteria, the licensee shall demonstrate to DEQ and OHA through field measurement that the recharge water does not exceed 9.25 mg/l or through the submittal of laboratory results that the recharge water does not exceed the 9.5 mg/l limit prior to restarting recharge.

(E) After each season of recharge, the licensee may present information to WRD for re-evaluation of allowable variation of the field instrument and maximum nitrate values.

10) **Water Level Monitoring.**

(A) The licensee shall monitor water levels in wells in the manner described in the approved ASR monitoring plan.

(B) The licensee shall submit a detailed water level monitoring plan for testing at each additional injection well as the project develops. The licensee shall obtain Department approval of a detailed plan before injection testing at a well may begin. If observation wells do not adequately describe the project's impact to the aquifer, the Department may require dedicated observation wells. The Department may approve, condition, or reject a plan.

(C) Transducer data shall be verified with quarterly manual measurements if an e-tape can be lowered past obstructions to the water level. In the event a pump is pulled, wells shall be equipped with an unobstructed, dedicated measuring tube pursuant to figure 200-5 in OAR 690-200.

11) **Recovery.** The availability of stored water for recovery is based on the following factors:

(A) Available stored water is determined on a well-by-well basis, unless the conditions of 11(D) are met. The licensee may recover up to 98% of the quantity injected under this license during the water year that the water was injected. After that water year, the availability of stored water shall be further diminished each water year such that the licensee may only recover up to 98% of any water year-to-water year storage carryover. For example, water year 2018 lasts from October 1, 2017 through September 30, 2018. Data collected by the licensee may be useful in consideration of modifications to this recovery provision under the license.

(B) Any water withdrawn from an ASR well identified in this license shall first be debited against the quantity available in the aquifer by virtue of ASR storage. When the ASR storage is depleted at an ASR well, any water withdrawn from an ASR well shall be considered a draft of natural ground water, requiring separate or additional authorization. At no time does this license authorize withdrawal of more water than was credited by injection.

(C) The availability of stored water is a running account that is subject to determination at any time.

(D) After the licensee drills the proposed second ASR well, well construction and hydrogeologic data may be presented to the Department to substantiate a well field storage accounting system. These data shall illustrate that the existing ASR well (UMAT 1166) and the proposed ASR well are hydraulically connected, storing and recovering water in the same aquifer within the Columbia River Basalts. Based on technical review, the Department may approve, condition or deny a proposal for well field storage accounting.

12) **Reporting.**

(A) Annual Water Year ASR Report. Except as otherwise noted, the licensee shall provide the Department a written report of the results of ASR testing for each water year by April 15th of the following water year. The first report shall be due in 2014 and include results from water year 2013. The report shall detail the several kinds of data collected during the water year (including the water quality results in a DEQ-specified format), analyze those data to show the ASR project impacts on the aquifer, indicate the testing/development progress made under the terms of the license, and account for the injection of stored water, withdrawals of stored and natural water, and the new-year carryover storage at the ASR well. Annual reports shall be sealed and signed by a professional(s) registered or allowed, under Oregon law, to practice geology.

(B) Annual Water Year Use Report. To integrate ASR and critical ground water area administrations, the licensee shall submit data collected per Condition 3 by December 1st each year on a form available from the Department.

(C) As pertinent, data shall be submitted as described in Special Reporting Condition 22.

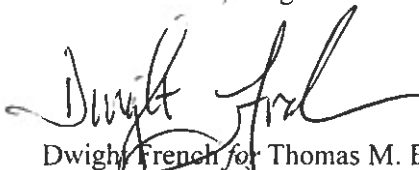
- 13) **Protection for Existing Users.** In the event of conflicts with existing appropriators, the licensee shall conduct all testing so as to mitigate the injurious effects. In addition, the licensee shall cooperate with the efforts of the Department to protect existing water rights and the water quality of existing users that rely upon the receiving aquifer and the injection source water.
- 14) **Use of Recovered Water.** The licensee shall use any recovered water for the purposes described in the appropriate diversion authorization.
- 15) **Additional Conditions on an Informal Basis.** The Department may suggest additional conditions to the licensee. Provided that those conditions are agreed to and undertaken by the licensee, the Department may forego formal changes to this license. This informal process does not extend to condition reductions. These additional conditions may be part of any license renewal or permit.
- 16) **Access.** The licensee shall allow reasonable access to ASR facilities to the watermaster and other state officials with an oversight role in this ASR project.
- 17) **Other Measures.** The licensee shall take additional measures, as appropriate, to address ASR-related issues such as landslide activation, seepage, streamflow increases, interference with nearby wells, aquifer storage limitations, and water quality protection. Further, the licensee shall notify the Department upon resolution of such issues. The licensee shall resolve these issues prior to submittal of an ASR permit application.
- 18) **Carryover Storage.** At the end of testing under this license, the licensee shall provide an accounting to the Department of the residual stored water based on the methods of determination given in this license. The Department shall consider this residual for carryover to a permanent ASR permit based on information which discloses the aquifer's ability to retain stored water.
- 19) **Detailed Testing Plans.** The licensee shall submit a detailed plan of testing for each injection well as the project develops. The plan shall include precise well location and construction data, water quality testing plans, and other testing features. The licensee shall obtain Department approval of a detailed plan before injection testing at a well may begin. The Department may approve, condition, or reject a plan.
- 20) **Well Construction.** Injection and recovery wells shall be open to a single aquifer in the Columbia River Basalt Group and shall meet applicable well construction standards (e.g., OAR 690-200 and OAR 690-210). Following well completion, the wells shall be thoroughly developed to remove cuttings and drilling fluids. A video log of the wells shall be collected to demonstrate to the satisfaction of the Department that each well is only open to a single aquifer. Additional data that help characterize the water bearing zone characteristics, including water quality and temperature, may also be provided to the Department. The wells shall be designed to limit the irretrievable loss of injected water to unsaturated zones.
- 21) **Cuttings.** During drilling of new project wells, the licensee shall collect cuttings at a minimum of 10- foot intervals and at major formation changes. A professional(s) registered or allowed, under Oregon law, to practice geology shall describe and analyze them to the degree necessary to determine the formation, member and flow unit within the Columbia River Basalt of the water bearing zone, and provide a split of the washed cuttings to the Department.

22) **Special Reporting Condition.** The licensee shall provide the following information to the Department:

- (A) Submission of any and all hydrogeologic data collected and reports developed for the project, including but not limited to cuttings analysis, video logs, geophysical logs, aquifer tests and step tests.
- (B) Submission of digital water level data for all ASR wells and any other wells measured in conjunction with the project (in a Department specified format), including annual report data.
- (C) Submission of annual reports with locations and elevations for all project wells (actual locations of built wells and proposed locations for proposed wells) and locations and elevations for all non-project wells that have been used for collecting water levels or other data pertinent to the project (in a Department specified format).
- (D) Notification in the annual report of any changes in well construction to the ASR license file.
- (E) Associating all project well data with the Department Well Identification Number (Well ID Number), the Department Well Log ID, if available, and the project Well Name.

23) **Well Tag Condition for Licensee Wells.** Prior to testing, the licensee shall ensure that their wells have been assigned a Department Well Identification Number (Well ID Number). A tag showing the Well ID Number shall be permanently attached to the well. If a well does not have a Well ID Number, the licensee shall apply for one from the Department and attach it to the well. The Well ID Number shall be used as a reference in any correspondence regarding the well, including any reports of water use, water level, or pump test data.

Dated at Salem, Oregon on March ~~22~~ 23, 2018.



Dwight French for Thomas M. Byler, Director
Water Resources Department

This order was produced by Jen Woody. If you have other questions about the Department or any of its programs please contact our Customer Service Group at 503-986-0801. Address all other correspondence to: Groundwater Section, Oregon Water Resources Department, 725 Summer St NE, Suite A, Salem OR 97301-1266, Fax: 503-986-0902.