

**AQUIFER STORAGE and RECOVERY (ASR) LIMITED LICENSE #007**

The Oregon Water Resources Commission issues this limited license for ASR TESTING to:

Kent Madison  
Madison Farms  
29299 Madison Road  
Echo, OR 97826

Telephone: (541) 376-8107

This limited license allows diversion of up to 400 gpm from one alluvial well near Butter Creek, a tributary of the Umatilla River, using the authorization of Permit G-7612.

The alluvial source water well is located at T3N/R28E, Section 31, SE1/4 NW1/4.

The licensee may store up to 70 million gallons using one injection well. The maximum injection rate is 400 gpm.

The basalt aquifer injection well is located at T3N/R27E, Section 25, SE1/4 SE1/4.

The licensee may recover up to 500 gpm of stored water through the same basalt well.

The maximum storage duration is the five-year duration of this limited license.

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

Echo Junction ASR Monitoring Plan  
Prepared by CH2MHILL, October 26, 2000

Water Sampling Assurance/Quality Control Plan  
Prepared by Groundwater Solutions, Inc., September 2002

Madison/McCarty ASR Monitoring Program  
Prepared by Groundwater Solutions, Inc., October 22, 2002

Memorandum  
Continuous Nitrate Monitoring – Madison ASR Project  
Prepared by Groundwater Solutions, Inc., November 1, 2002

**This is a final order in other than contested case.** Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-01-005 you may either petition the Director for reconsideration of this order or petition for judicial review of this order. As provided in ORS 536.075, this order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2).

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This limited license is issued with the following conditions:

1) License 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 limited license.

2) Notice Prior to Injection, Recovery, and Baseline Aquifer Testing. The licensee shall give notice, in writing, to the watermaster not less than 15 days in advance of either initiating any injection under the limited license, recovering stored water or performing baseline aquifer testing. The injection notice shall include the limited 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. For any water year, injection shall not begin before December 5<sup>th</sup>. The recovery (or testing) notice shall include the limited 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 of injection and recovery and the total metered quantity injected and recovered. The record of use may be reviewed by Department staff upon request.

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 limited license for any of the following reasons:

(i) to reflect changes in Oregon Department of Human Services (DHS) and Oregon Department of Environmental Quality (DEQ) water quality or treatment standards;

(ii) to address needed technological changes as requested by DEQ or HDS 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 limited license. (For purposes of this license, a well location change to an adjacent 1/4 1/4 section is a minor adjustment.)

(B) The Director may revoke or modify the ASR limited license for any of the following reasons:

(i) to prevent or mitigate injury to other 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 limited license.

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(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 limited license.

5) Priority/Protection. This limited 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 Permit G-7612 retains the priority date and protection of that water right.

6) Compliance with Other Laws. The injection of acceptable water into the aquifer as well as its storage and recovery under this limited 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 (DEQ's) Underground Injection Control registration program as authorized under the Safe Drinking Water Act (40 CFR 144.26).

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 .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 .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), the licensee shall immediately stop injection activities upon receipt of lab data and notify the Department within five days. Injection may commence after constituent levels return to acceptable levels pursuant to (B) or (C) of this condition.

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**8) Water Quality Sampling.**

(A) Injection Water. The licensee shall sample and analyze injection water for the constituents regulated under OAR 333-61-030 (ORS 448.131 and .273) or OAR 340-40 (ORS 468B.165) as well as other constituents as described in the pilot test program documents.

(B) Wells. The licensee shall sample receiving aquifer water at the repaired injection well per condition 19 prior to any storage at the well. The licensee shall sample for the constituents regulated under OAR 333-61-030 (ORS 448.131 and .273) or OAR 340-40 (ORS 468B.165) as well as other constituents as described for wells in the pilot test program documents. The licensee shall analyze the data and demonstrate that the source and receiving aquifer waters are compatible prior to any storage at the well.

(C) Withdrawal of Stored Water. The licensee shall analyze water withdrawn from storage for the constituents regulated under OAR 333-61-030 (ORS 448.131 and .273) or OAR 340-40 (ORS 468B.165) as well as other constituents as described in the pilot test program documents and OAR 690-350-020(3)(b)(F)(iv).

**9) Nitrate Monitoring Program.** The licensee shall install a continuous nitrate monitoring device on the recharge line in general accordance with the nitrate monitoring memorandum dated November 1, 2002, with the following exceptions:

(A) Licensee shall perform an assessment of the accuracy and precision of the nitrate monitoring instrument in the field prior to initiating recharge in order to evaluate the variation in the instrument's readings. The assessment will be used to determine the appropriate nitrate sampling frequency and it will be used to develop an appropriate response procedure in the event of a nitrate threshold exceedence. The assessment will include the following steps:

(i) Licensee shall monitor and record nitrate values for the recharge water under field conditions using the field testing equipment on an hourly basis for a period of 24 hours.

(ii) Licensee shall collect a total of three samples: one at the beginning, one in the middle, and one at the end of the 24 hour test period, and submit all three samples to a laboratory for nitrate analysis.

(iii) Licensee shall compute the deviation between the laboratory measurements and the field measurement and assess the variability between the field measurements and the laboratory measurements.

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- (iv) Based on the results of the accuracy and precision assessment described in (A)(i), (A)(ii) and (A)(iii), the licensee shall submit for approval to WRD, DEQ and DHS a nitrate sampling frequency, a maximum sample limit for nitrate (i.e., a single value that causes immediate cessation of recharge), an upper limit of acceptable variance between field and lab measurements, and appropriate response procedures in the event of a nitrate threshold exceedence, taking into consideration the natural variability in field measurements. The response procedures will include a discussion on how the water will be handled if a trigger level is exceeded and how the recharge system will be brought back online after exceeding a trigger level.
  - (v) Within 30 days of receiving the information required in (A)(iv), DHS and DEQ will provide comments to WRD regarding the acceptability of the proposed limits and response procedures. WRD must provide approval prior to injection by the licensee.
- (B) Once the sample frequency and response procedures have been accepted by DEQ and DHS, recharge may be initiated. The nitrate monitoring will be performed in accordance with the following guidelines:
- (i) Licensee shall calibrate the nitrate meter in accordance with manufacturer's standards and procedures including a two point calibration once per week (using two known concentrations) and a three point calibration once every three weeks (using three known concentrations at two temperatures at least 10 degrees C apart).
  - (ii) Licensee shall collect and submit a recharge water sample for nitrate testing by a laboratory within one week prior to starting recharge and once per week during the recharge season. Once the variability of the field nitrate monitoring is established over at least one recharge season, and after consultation with DEQ and DHS, WRD may approve less frequent laboratory testing.
  - (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 or as defined in (A)(iv).
  - (iv) Licensee shall compute a 4-point moving average of the field measured nitrate concentrations using the sample frequency identified in (A)(iv).
  - (v) Licensee shall compare field nitrate measurements to weekly laboratory measurements on a monthly basis to check the accuracy and precision of the field instrument. If the allowable variation exceeds the upper limit established in (A)(iv) then 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 4-point moving average nitrate concentration computed in (B)(iv) exceeds 7 mg/L.

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(D) If recharge is shut down by an exceedance of the nitrate criteria, the licensee shall demonstrate to DEQ and DHS through laboratory testing that the recharge water does not exceed the 7 mg/L limit prior to restarting recharge.

10) Water Level Monitoring. The licensee shall monitor water levels in wells in the manner described in the pilot test program documents. The licensee shall submit a detailed water level monitoring plan for testing at any subsequent injection well.

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. The licensee may recover up to 98% of the quantity injected under this limited 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 2003 lasts from October 1, 2002 through September 30, 2003.) (Data collected by the licensee may be useful in consideration of modifications to this recovery provision under the limited license.)

(B) Any water withdrawn from an ASR well identified in this limited 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 limited 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.

12) Reporting. Except as otherwise noted, the licensee shall provide the Department a written report of the results of ASR testing for each water year by December 1st of the following water year. The first report shall be due in 2003 and include results from water year 2003. The report shall detail the several kinds of data collected during the water year (including the water quality results in conditions 8 and 9), analyze those data to show the ASR project impacts on the aquifer, indicate the testing/development progress made under the terms of the limited license, and account for the injection of stored water, withdrawals of stored and natural water, and the new-year carryover storage at each well.

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.

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14) Use of Recovered Water. The licensee shall use any recovered water for the use allowed in the diversion authorization. Specifically, the licensee shall use any recovered water for the purposes described in Permit G-7612.

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) Publicity. The licensee shall maintain a public information program about the ASR project, which may include press releases, neighborhood meetings, brochures, or other activities. This program shall include information on potential project impacts and how to report possible impacts to the licensee. The licensee shall share such reports with the watermaster within five days of receipt.

17) Other Measures. The licensee shall take any additional measures appropriate to address the ASR-related issues of aquifer boundary determination, aquifer storage efficiency, and water quality protection so that these issues can be addressed during review of the ASR permit application.

18) Carryover Storage. At the end of testing under this limited 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) Well Repairs. The licensee must repair the basalt aquifer injection well before any injection may take place. Prior to commencing any repair on the well, the licensee shall submit, in writing, a proposal for reconstruction of the well. The proposal shall be approved by the Department prior to well repair. The repair shall stop the leakage around the casing from the shallow aquifer that currently exists.

20) Testing and Well Repair. The well shall be repaired prior to beginning baseline aquifer testing and monitoring.


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This license is issued with proper conditions upon finding that:

- i) The proposed ASR testing will not impair or be detrimental to the public interest;
- ii) The proposed ASR testing will produce information that will adequately describe the water quality and quantity response in the aquifer and at nearby wells and springs due to ASR activities; and
- iii) The proposed use will not expand use under an existing water right.

This license shall be in effect beginning June 24, 2003, and shall expire June 24, 2008.

WITNESS my hand this 24<sup>th</sup> day of June, 2003.

  
Water Resources Department  
Paul R. Cleary  
Director