

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

In the Matter of Aquifer Storage and Recovery)
(ASR) Limited License Application #001,)
Marion County

SUMMARY 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

On March 6, 1997, the Department issued ASR Limited License # 001 to the City of Salem. That license authorized ASR testing for five years at up to fifteen wells in a Columbia River Basalt aquifer. Condition 1 of ASR Limited License # 001 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. ASR Limited License #001 was renewed March 5, 2002 and again on March 7, 2007.

FINDINGS OF FACT

1. On April 4, 2012, the City of Salem submitted a request for a five-year time extension (renewal) for ASR Limited License #001.
2. The Department provided public notice of the application in the Department's weekly public notice on April 10, 2012. A 30-day comment period followed.
3. The Department received no public comments related to the possible renewal of an ASR limited license.
4. The Department sought comments and recommendations from Oregon Department of Environmental Quality and Oregon Health Authority Drinking Water Program related to the possible renewal. Comments were received from Oregon Department of Environmental Quality and Oregon Health Authority Drinking Water Program supporting renewal of ASR LL #001.
5. The Department evaluated the renewal request and comments and determined the proposed renewal 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 letter 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 #001 for five years is consistent with the requirements of OAR 690-350-0020(5)(c) and Condition 1 of ASR Limited License #001.

ORDER

Now, THEREFORE, it is ORDERED, ASR Limited License #001 shall be valid through the fifth anniversary of its renewal, pursuant to ORS 537.534, OAR 690-350-0020(5)(c), and Condition 1 of the original ASR limited license.

Except as modified by other provisions of this limited license, the licensee is authorized to pursue the project schedule, monitoring, and other features noted in the original and subsequent ASR test plans. 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 the ASR testing plan are provided in the application documents and amendments entitled:

City of Salem
Department of Public Works
Aquifer Storage and Recovery
Draft Implementation Plan.
June 1996

Appendix A
Letter Subject: Updated Water Quality Testing Requirements for ASR Projects
To: Oregon Department of Water Resources
From: Groundwater Solutions, Inc.
December 17, 2003

The ASR testing must provide data 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 well, aquifer, springs and nearby wells; accounting of ASR inputs, withdrawals, and storage; water quality testing needs; and well hydraulics at the ASR well.

The licensee may divert up to 26 cfs from the North Santiam River, tributary of the Willamette River, using authorization of water right Certificate 12033.

The point of diversion is located in SW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 13, T9S/R1W, W.M.

The licensee may store up to one billion gallons in a basalt aquifer. The maximum storage duration is the five-year duration of this limited license. With the authorization of individual ASR well test plans, up to 15 ASR wells are potentially allowed at a combined withdrawal of rate up to 13,800 gpm. These wells consist of the following:

<i>Well Name</i>	<i>Capacity (gpm)</i>	<i>Well Location in T8S/R3W W.M.</i>
ASR #1 (MARI 19624)	1000	730 ft south and 730 feet east from center of Section 10
ASR #2 (MARI 50075)	1800	730 ft south and 760 ft east from center of Section 10
ASR #3 (MARI 53673)	2000	500 ft south and 375 ft east from center of Section 10
ASR #4 (MARI 53675)	2000	360 ft south and 800 ft east from center of Section 10
ASR #5 (MARI 53674)	2000	830 ft south and 1100 ft east from center of Section 10
ASR #6 (MARI 55655)	2000	250 ft south and 80 ft east from center of Section 10
ASR #7 (proposed)	2000	Section 9, NW ¼ SE ¼
ASR #8 (proposed)	2000	Section 9, NW ¼ SE ¼
ASR #9 (proposed)	2000	Section 9, NW ¼ NE ¼
ASR #10 (proposed)	2000	Section 10, NE ¼ SW ¼
ASR #11 (proposed)	2000	Section 10, NW ¼ NW ¼
ASR #12 (proposed)	2000	Section 10, NW ¼ NW ¼
ASR #13 (proposed)	2000	Section 10, SE ¼ NW ¼
ASR #14 (proposed)	2000	Section 10, SE ¼ SW ¼
ASR #15 (proposed)	2000	Section 10, SE ¼ SW ¼

In the event the wells listed above cannot produce the estimated quantities or cannot be built, the licensee may develop wells at the following optional locations to bring about the total authorized production rate:

Opt #1	2000	Section 9, NW ¼ SE ¼
Opt #2	2000	Section 9, NE ¼ SE ¼
Opt #3	2000	Section 9, SE ¼ SE ¼

Other 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 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 limited license or recovering stored water. The licensee shall give verbal notice to the watermaster within 2 days of initiating recovery of stored water for emergency demand. 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. The recovery 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 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 limited license.

(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.

(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.
- 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 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) **Detailed Testing Plans.** The licensee shall submit a detailed testing plan for each injection well as the project develops. The plan shall include precise well location and construction information, in addition to other testing features, and shall be sealed and signed by a professional(s) registered or allowed, under Oregon law, to practice geology. The licensee shall obtain Departmental approval of a detailed plan before injection testing at a well may begin. The Department may approve, condition, or reject a detailed plan.
- 8) **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) The licensee shall be in compliance with treatment requirements and performance standards for source water identified in OAR 333-61-032;
- (F) 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 (8)(B) or the 100% level prescribed in condition (8)(C), the licensee shall stop injection activities immediately upon receipt of lab data and notify the Department within five days;
- (G) The licensee shall minimize to the satisfaction of OHA the use of water from the infiltration gallery at the North Santiam River as a source of injection water.

9) Water Quality Sampling.

(A) ASR Activities Outside Woodmansee Park. The following provisions apply to ASR activities that are located outside Woodmansee Park.

(i) Injection Water. Each year, prior to initiating injection in any well or group of wells, the licensee shall analyze a single injection water sample for the constituents included in Appendix A dated December 17, 2003. No more than one sample of injection water will be analyzed during a calendar year.

(ii) New Wells. As each new ASR well is brought on-line, the licensee shall sample the receiving aquifer water at the well prior to any storage at the well. The sample shall be analyzed for the compounds listed in Appendix A dated December 17, 2003. For each new well, a single sample will be collected immediately after well construction and preferably at the time of pump testing.

(iii) Background for Wells Prior to Injection. Approximately one month prior to injection to a well, the licensee shall analyze a single sample from the well for the constituents included in Appendix A dated December 17, 2003. [Note: The one month time period is needed in order to obtain laboratory results prior to initiating injection.] In the case of a new well which has not received injection water yet, this sample is required in addition to the sample described above for New Wells. Sampling will be conducted prior to the first scheduled withdrawal of the calendar year and no more than a single background sample prior to injection will be collected from a single well in the calendar year.

(iv) Background for Wells Prior to Withdrawal. Approximately one month prior to withdrawal from a well, the licensee shall analyze a single sample from the well for the constituents included in Appendix A dated December 17, 2003. [Note: The one month period is needed in order to obtain laboratory results prior to initiating withdrawal.]

(v) Withdrawal of Stored Water. The licensee shall analyze water withdrawn from storage for the constituents included in Appendix A dated December 17, 2003. The sample will be collected during the initial 48 hours of withdrawal from the well which is placed in service for withdrawal.

(vi) Background for Wells in Service. The licensee shall analyze wells which are operational but which are not being used for injection or withdrawal, annually for general physical parameters and inorganic constituents as identified in Appendix A dated December 17, 2003. The objective of the sampling is to evaluate spatial and temporal variances in water quality in ASR wells which are not otherwise being sampled.

(B) ASR Activities Inside Woodmansee Park. The following provisions apply to ASR activities that are located inside Woodmansee Park as they are considered to be a single system.

(i) New ASR Wells. Prior to a new ASR well being brought on-line, the licensee shall sample the receiving aquifer water at the new ASR well prior to any storage at the well. The list of constituents to be tested for is presented in Appendix A dated December 17, 2003. A single water sample will be collected from the new ASR well immediately after well construction (preferably at the time of aquifer testing).

(ii) Native Ground Water Conditions Prior to Injection. Each year, the licensee shall collect a single water sample from the receiving aquifer approximately one month prior to the anticipated start of injection. [Note: The one month time period is needed in order to obtain laboratory results prior to initiating injection.] The water sample will be analyzed for the geochemical constituents, as listed in Appendix A dated December 17, 2003, and may include testing for other constituents deemed necessary to track the spatial and temporal variations in native groundwater geochemistry, such as disinfection by-products and radon. The sample shall be collected from an operational ASR well and not from a new ASR well, which has not yet received injection water.

(iii) Injection Water. Each year, approximately one month prior to the anticipated start of injection, the licensee shall collect a single sample of the injection source water and analyze the sample for the constituents listed in Appendix A dated December 17, 2003. [Note: The one month time period is needed in order to obtain laboratory results prior to initiating injection.]

(iv) Withdrawal of Stored Water. Each year, approximately one month prior to the anticipated start of recovery, the licensee shall collect a single sample of the stored water from the receiving aquifer and analyze the sample for the constituents listed in Appendix A dated December 17, 2003. The sample must be collected from an operational ASR well and not from a new ASR well, which has not yet received injection water. [Note: The one month time period is needed in order to obtain laboratory results prior to initiating injection.]

(v) Wells in Service. At the discretion of the licensee, periodic water samples will be collected from the ASR wells in service and analyzed for the general physical parameters and inorganic (geochemical) constituents as listed in Appendix A dated December 17, 2003. The analytical results will be used to evaluate spatial and temporal variances in water quality.

10) Water Level Monitoring.

- (A) The licensee shall monitor water levels in wells in the manner described on page 3-10 in the ASR testing plan dated June 1996. Monitoring shall occur at ASR wells, ASR monitoring wells, and, to the extent possible, at the Tiedeman, Arlene, and Friendship wells.
- (B) The licensee shall attempt to measure static water levels, if possible, in the following wells as referenced on Plate 1 of the application's September 1995 report entitled Technical Memorandum on Hydrogeology for Aquifer Storage and Recovery Pilot Project:

<u>Report ID</u>	<u>Well Log ID</u>
2da or 2dc	MARI 11348 or MARI 11349
3ad	MARI 11356
3da(cb)	MARI 11357
4cb	MARI 11360
11a	MARI 11705/11697
11bd	MARI 11715
16a	MARI 11999
33ad	MARI 8155

- 11) **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, wells drilled after the issuance of this renewed limited license 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 open only 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.
- 12) **Streamflow Monitoring.** The licensee shall monitor streamflows biweekly in July, August, and September on Croissan, Clark, and Pringle Creeks. This monitoring shall seek to detect base flow which may be the result of leakage of stored water. Conditions may preclude some monitoring events since certain flows may be strongly influenced by recent rains.
- 13) **Recovery.** The availability of stored water for recovery is based on the following factors:
 - (A) Available stored water is determined on a well-field/aquifer basis. The licensee may recover up to 95% of the quantity injected under this limited license during the year that the water was injected. After that year, the availability of stored water shall be further diminished each year such that the licensee may only recover up to 95% of any year-to-year storage carryover.

For example, water year 2013 lasts from October 1, 2012 through September 30, 2013. Data collected by the licensee may be useful in consideration of proposed 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. This limited license does not authorize withdrawal of more water than was available from injection.
- (C) The licensee may not recover any stored water when static water levels at ASR wells become lower than the pre-injection baseline elevation. It is currently assumed that this elevation is 189 feet msl. However, the Department will approve a different value for the pre-injection baseline annual low static water level elevation if the licensee provides data and analysis during the license period which supports a different value than the currently assumed value.
- (D) The availability of stored water is a running account which is subject to determination at any time.

14) Annual Reporting.


- (A) Except as otherwise noted, the licensee shall provide the Department a written report of the results of ASR testing for each water year by February 15th of the following water year. The report shall detail the several kinds of data collected during the water year (including the water quality results in condition 9, in a DEQ-specified format), analyze those data to show the ASR project impacts on the aquifer, analyze for loss, 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. Annual reports shall be sealed and signed by a professional(s) registered or allowed, under Oregon law, to practice geology.
- (B) As pertinent, annual reporting shall include the formatting and additional information cited in Condition 15 below.

15) 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 locations) 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 limited 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.
- 16) **Well Tag Condition for Licensee Wells.** 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.
- 17) **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.
- 18) **Use of Recovered Water.** The licensee shall use any recovered water for municipal purposes as described in the water right certificate 12033.
- 19) **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.
- 20) **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.
- 21) **Other Measures.** The licensee shall take any 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. The licensee shall resolve these issues prior to submittal of an ASR permit application.
- 22) **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.

Dated at Salem, Oregon on June 11, 2012.


Dwight French for Phillip C. Ward, 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: Ground Water Section, Oregon Water Resources Department, 725 Summer St NE, Suite A, Salem OR 97301-1266, Fax: 503-986-0902.

Mailing List for FO

Scheduled Mailing Date:

Application:

ASR Limited License #001 - RENEWAL

Original mailed to Applicant:

City of Salem ✓
c/o Jason Pulley
Public Works Dept.
555 Liberty St SE
Salem, OR 97301

<p>Copies Mailed</p> <p>by: <u>Connie Vance</u> (STAFF)</p> <p>on: <u>6/12/2012</u> (DATE)</p>

Copies of FO sent to WRD:

1. Mike McCord, Watermaster District 16 ✓ via email 6/11/2012
2. Bill Ferber, Region Manager ✓ via email 6/11/2012
3. File - Jan Woody

Copies of FO sent to other interested persons (CWRE, Agent, Commenter, etc.):

1. Tom Pattee, Oregon Health Authority Drinking Water Program ✓
2. Jack Arendt, Oregon Department of Environmental Quality ✓
3. Ted Ressler, GSI Water Solutions, Inc. ✓

via
email 6/11/2012