

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

In the Matter of Aquifer Storage and Recovery)
(ASR) Limited License Application #002,)
Washington 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. OAR 690-350-0010 describes general provisions for ASR under Oregon law.

BACKGROUND

Tualatin Valley Water District and the City of Beaverton began ASR testing under ASR LL #002 in 1998. The license was renewed in 2003, 2009 and 2013. Condition 1 of ASR Limited License #002 provides for renewal pursuant to OAR 690-350-0020(5)(c), and describes the following terms for renewal: The license may be renewed if the licensees demonstrate to the Director's satisfaction that further testing is necessary and that the licensees complied with the terms of the license. On August 6, 2018, the Department received application for renewal with modifications of ASR Limited License #002. The Department determined the renewal request was complete on August 8, 2018.

FINDINGS OF FACT

1. On August 6, 2018, Tualatin Valley Water District and the City of Beaverton submitted a request for renewal of ASR Limited License #002. The licensees also requested modifications to ASR Limited License #002, including ASR well name and location changes, an increase in the maximum storage volume and a change in the storage account system. The Department determined the application was complete on August 8, 2018.
2. The Department provided public notice of the application in the Department's weekly public notice on August 14, 2018. A 30-day comment period followed.
3. The Department received no comments related to the possible renewal of ASR Limited License #002.
4. The Department sought comments and recommendations from Oregon Department of Environmental Quality (DEQ) and Oregon Health Authority Drinking Water Services (OHA) related to the possible renewal. Comments were received from DEQ and OHA supporting the renewal of ASR LL #002.
5. The Department reviewed the proposed modifications provided by the applicant. The authorization of ASR LL #002 is conditioned accordingly.
6. The Department reviewed the renewal application 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 licensees have demonstrated to the Director's satisfaction that further testing is necessary and that the licensees have complied with the terms and conditions of the license.
7. The Department evaluated the application and comments and determined:
 - a. The proposed ASR testing will not impair or be detrimental to the public interest;
 - b. 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

- c. The proposed testing will not expand the use under an existing water right.

CONCLUSIONS OF LAW

The request to renew ASR Limited License #002 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 #002 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 licensees are authorized to pursue the project schedule, monitoring, and other features noted in the original and subsequent ASR pilot 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 licensees to reflect the license issuance date or other delays. Features of that ASR testing plan are provided in the application documents entitled:

CH2M HILL, June 1997. Aquifer Storage and Recovery Pilot Test Work Plan and Wellhead Facility Design: Prepared for Tualatin Valley Water District.

CH2M HILL, 1998. Aquifer Storage and Recovery Pilot Test Work Plan Addendum: Prepared for City of Beaverton.

Golder Associates, Inc., 2007. ASR Pilot Test Work Plan Addendum: Tualatin Valley Water District Grabhorn Reservoir Site.

Groundwater Solutions, Inc., November 15, 2005. Pilot Test Work Plan for the City of Beaverton ASR No. 4 Well and Request to Adjust ASR Limited License #002, City of Beaverton Aquifer Storage and Recovery Project.

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 licensees may divert up to 12.5 MGD from a combination of the following:

Source/ Water Right	Point of Diversion Location
Bull Run River/ ORS 538.420	T1S/R5E, SECTION 26 SE ¼ SE ¼
Tualatin River/ Certificate 85914	500 FEET NORTH, 410 FEET EAST FROM THE SW CORNER OF SECTION 8, T1S/R3W

The licensees may store up to 1.5 billion gallons in a basalt aquifer using 13 injection wells. The licensees may recover for MUNICIPAL USE a combined withdrawal of up to 14.4 MGD of stored water through the same 13 wells. The maximum storage duration is the five-year duration of this license.

THIRTEEN ASR wells are authorized for injection and recovery at a combined rate not to exceed 14.4 MGD per activity. The ASR wells are authorized as follows:

Licensee	Well Name	Well Log ID	Rate (MGD)	Well Location
TVWD/Beaverton	ASR #1	WASH 54507	1.5	1,250 FT SOUTH AND 1,170 FT WEST FROM CENTER OF SECTION 17, T1S/R1W
TVWD/Beaverton	Schuepbach	WASH 8862	1.5	1,600 FT SOUTH AND 1,200 FT WEST FROM CENTER OF SECTION 17, T1S/R1W
Beaverton	ASR #4	WASH 61319	3.0	480 FT NORTH AND 2,445 FT WEST FROM SE CORNER, SECTION 21, T1S/R1W
Beaverton	ASR #2	WASH 55918	3.0	235 FT NORTH AND 2,430 FT EAST FROM SW CORNER, SECTION 21, T1S/R1W
Beaverton	ASR #10	Not yet drilled	3.0	SECTION 29, SE1/4 SW1/4, T1S/R1W
Beaverton	ASR #9	Not yet drilled	3.0	SECTION 30, NW1/4 SW1/4, T1S/R1W
Beaverton	ASR #5	WASH 76834	3.0	540 FT NORTH AND 2,495 FT EAST FROM SW CORNER OF SECTION 21, T1S/R1W.
Beaverton	ASR #3	WASH 57952	3.0	1,640 FT SOUTH AND 60 FT EAST FROM NW CORNER, SECTION 5, T2S/R1W
TVWD	Jenkins Estate	WASH 10279	3.0	720 FT SOUTH AND 950 FT WEST FROM SE CORNER, SECTION 23, T1S/R2W
TVWD	Grabhorn	WASH 10148	3.0	200 FT NORTH AND 780 FT WEST FROM SE CORNER, SECTION 23, T1S/R2W
TVWD	189 th Ave	WASH 10200	3.0	1,500 FT NORTH AND 750 FT WEST FROM SE CORNER, SECTION 24, T1S/R2W
Beaverton/TVWD	ASR #8	Not yet drilled	3.0	SECTION 25, NE1/4 SE1/4, T1S/R2W
Beaverton	ASR #6	WASH 74133	3.0	1,520 FT NORTH AND 125 FT WEST FROM SE CORNER OF SECTION 30, T1S/R1W

The ASR testing project shall be operated according to the following conditions, pursuant to OAR 690-350-0020(5). Failure to comply with any of the provisions of this license may result in action including, but not limited to, revocation of the license.

- 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 licensees 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 licensees 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 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 licensees 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 Services (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 448.273) or OAR 340-40 (ORS 468B.165);
 - (iii) to address written request from the applicant for minor adjustments to the authorization in the limited license.
 - (B) The Director may revoke, suspend or modify the ASR limited 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 Certificate 12033 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 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). Likewise, for those ASR wells within the area covered by the DEQ National Pollution Discharge Elimination System (NPDES) MS4 Permit Number 101309, pilot test recovery discharges to the storm sewer system must be approved by the permittee, the Clean Water Services agency of Washington County, et al. For those wells outside the area covered by this NPDES Permit, the licensees may need to obtain a discharge permit directly from the DEQ.
- 7) **Detailed Testing Plans.** A licensee shall submit a detailed plan of testing for each injection well as the project develops. A 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 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 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 448.273) 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 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.

9) Water Quality Sampling.

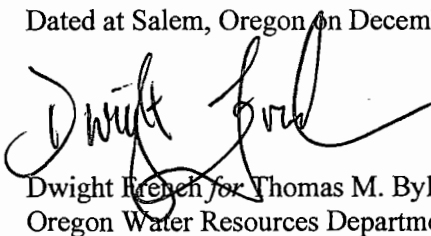
- (A) Injection Water. Prior to initiating injection, the licensees shall sample and analyze injection water for the constituents regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-40 (ORS 468B.165) as well as others constituents as described in the current approved test plan.
- (B) Wells. As each new ASR well is brought on-line, the licensees shall sample receiving aquifer water at the well prior to any storage at the well. The licensees shall sample for the constituents regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-40 (ORS 468B.165) as well as others constituents as described for wells in the current approved test plan. The licensees shall sample receiving aquifer water at ASR observation wells as described in the same pilot test plan. Sampling of the receiving water at ASR #4 is not required unless specifically directed by the Department.
- (C) Withdrawal of Stored Water. The licensees shall analyze water withdrawn from storage for the constituents regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-40 (ORS 468B.165) as well as others constituents as described in the current approved test plan and OAR 690-350-020(3)(b)(F)(iv). Sampling shall be conducted according to the frequencies established in OAR 333-61-0036.

- (D) **Well-field Sampling.** Water-quality sampling at Beaverton's ASR #1, #2, and #4 will be based on a well-field approach, unless otherwise specified by the Department. ASR compliance water samples may come from any of these wells and need not come from all of them.
- 10) **Water Level Monitoring.** The licensees shall monitor water levels in wells according to the current approved test plan. Monitoring shall include shallow groundwater monitoring in the vicinity of Johnson Creek. A licensee shall submit a detailed water level monitoring plan for testing at each injection well. The Department shall approve, condition or reject the plan.
- 11) **Injection.** Due to the shallow and aged seals at the Schuepbach and Hanson Road wells, the licensees shall apply no hydraulic pressure to the seals at these wells during injection.
- 12) **Recovery.** The amount of stored water available for recovery is based on the following factors:
- (A) Available stored water is determined on a well-by-well basis. The licensees 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 licensees may only recover up to 98% of any year-to-water year storage carryover. Data collected by the licensees may be useful in consideration of modifications to this recovery provision under the license. If the injected source water is lost through migration or other means, or groundwater otherwise present in the aquifer is irretrievable or displaced as a result of ASR, the Department may revise the recoverable percentage to protect the groundwater resource and other users.
- (B) Any water withdrawn from an ASR well identified in this limited license shall be debited against the quantity available in the aquifer by virtue of ASR storage or considered a draft on natural groundwater under existing groundwater rights. Simultaneous withdrawals of natural groundwater and stored water may occur, but at no time shall the total withdrawal rate exceed that which is authorized in this limited license. The licensee shall report monthly amounts debited against the ASR storage account and the amount of natural groundwater withdrawn. This limited license does not authorize withdrawal of more water than was available from injection. In the event that static water levels at project wells drop below pre-ASR groundwater elevations or other unforeseen issues occur, the Department may review, modify or revoke this condition and re-evaluate the storage account balance.
- (C) The availability of stored water is a running account that is subject to determination at any time.
- 13) **Reporting.**
- (A) **Annual Water Year ASR Report.** Except as otherwise noted, the licensees 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 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) Data shall be submitted as described in Condition 20.

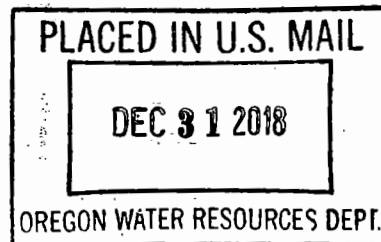
- 14) **Protection for Existing Users.** In the event of conflicts with existing appropriators, the licensees shall conduct all testing so as to mitigate the injurious effects. In addition, the licensees shall cooperate with the efforts of the Department to protect existing water rights and the water quality of existing users that rely upon the receiving aquifer and the injection source water.
- 15) **Use of Recovered Water.** The licensees shall use any recovered water for municipal purposes as described in ORS 538.420 and water right permit S-45455 (Certificate 85914). This use includes storm water discharges authorized in the ASR testing program.
- 16) **Additional Conditions on an Informal Basis.** The Department may suggest additional conditions to the licensees. Provided that those conditions are agreed to and undertaken by the licensees, 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.
- 17) **Publicity.** The licensees 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 licensees. The licensees shall share such reports with the watermaster within five days of receipt.
- 18) **Other Measures.** The licensees 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.
- 19) **Carryover Storage.** At the end of testing under this license, the licensees 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.
- 20) **Special Reporting Condition.** The licensees 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 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.

- 21) **Well Tag Condition for Licensee Wells.** Prior to testing, the licensees 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 wells. 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.
- 22) **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.
- 23) **Cuttings.** During drilling of new project wells, the licensee shall collect cuttings at a minimum of 10- foot intervals and at major formation changes. The licensee 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.

Dated at Salem, Oregon on December 20, 2018.



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



This order was produced by Jen Woody. If you have 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.