

ASR Limited License No. 26




APPLICATION FOR RENEWAL OF  
AQUIFER STORAGE AND RECOVERY (ASR) LIMITED LICENSE

Applicant: City of Prineville, Attn: Casey Kaiser  
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Authorized Agent: GSI Water Solutions, Inc. Attn: Bruce Brody-Heine  
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Per OAR 690-350-020(5)(c), an ASR LL may be renewed upon request from the licensee if the applicant demonstrates to the Department's satisfaction that further testing is necessary and that the licensee complied with the terms of the current ASR LL. The applicant may also request modifications to an ASR LL at the time of renewal. Please consult the current ASR LL and provide as attachments the following:

- Explanation of why further testing is necessary
- Summary of compliance with ASR LL
- Request for changes, as needed
- ASR LL Renewal Fee. Consult current fee schedule at:  
<http://www.oregon.gov/owrd/pages/pubs/forms.aspx#fees>
- Submit one hard copy in person or by mail to: Oregon Water Resources Department, 725 Summer St NE, Suite A, Salem, OR 97301
- Submit a digital copy to: [Jennifer.L.Woody@oregon.gov](mailto:Jennifer.L.Woody@oregon.gov)
- Questions? Contact Jen Woody, OWRD Hydrogeologist, at 503-986-0855

Signature of Applicant  Date 10/10/23  
Title Public Works Director



## MEMORANDUM

### City of Prineville ASR Limited License #026 Request for a 5-Year Renewal

**To:** Jen Woody, RG, Oregon Water Resources Department

**From:** Trevor Grandy, RG, CWRE, GSI Water Solutions, Inc.  
Bruce Brody-Heine, RG, CWRE, GSI Water Solutions, Inc.

**CC:** Casey Kaiser, Public Works Director, City of Prineville

**Date:** October 10, 2023

The City of Prineville (City) requests a 5-year renewal of Aquifer Storage and Recovery (ASR) Limited License #026, which will expire on April 24, 2024. We understand that certain criteria must be met to grant a renewal of the limited license as outlined under Condition 20, License Renewal, in ASR Limited License #026. A discussion of the key points pertinent to Condition 20 is provided below.

#### Reason for Renewal

The City requests a renewal of ASR limited license #026 so that it may continue to monitor the dynamic response of the airport aquifer to ASR activities and continue the important pilot testing work needed as the City continues the buildout of the ASR system. To date, the City's ASR pilot testing program has been successful and no adverse impacts to the aquifer resource have been identified because of ASR activities. The ongoing monitoring and testing are key to helping the City continue to expand the program towards full build-out and optimize long-term ASR operations.

City ASR injection occurs between November and April. The source water for ASR is alluvial groundwater from the City's Ochoco Valley Wellfield and other alluvial groundwater wells. ASR Limited License #026 authorizes the City to divert up to 3,000 gallons per minute (gpm) for injection. The City holds 7 water rights that authorize groundwater pumping from the Prineville Valley alluvial aquifer. ASR Limited License #026 authorizes the City to inject up to 1,100 gpm per well in up to in five ASR wells and store up to 870 million gallons (MG) in the airport aquifer. Recovery occurs between May and October to supplement the City's summer demand. ASR Limited License #026 authorizes up to 2,000 gpm of recovery per well from up to five ASR wells. To date, the City has constructed one ASR well and completed four years (cycles) of pilot testing. Each cycle the City has increased the injected/storage volume while monitoring the response in the aquifer system. To date, Cycle 4 injected the largest volume of water at 158.7 MG in one cycle (< 20% of the authorized volume).

The City has identified building out the ASR program towards the authorized limits in their limited license as part of their long-term strategy to meet future municipal water supply demands. The City has not fully determined the storage capacity of the aquifer system and how many additional ASR wells are needed to optimize the operation of the City's ASR program allowed under the limited license. Renewal of ASR Limited License #026 will allow the City to continue the ASR pilot testing program as the City increases the capacity of the ASR program.

## Compliance with Terms and Conditions of the Current Limited License

Several terms and conditions are defined in ASR Limited License #026, such as groundwater monitoring, surface water monitoring, water quality sampling, and rate limits for injection and pumping. The City has complied with the terms and conditions of the current limited license and has worked in good faith to report ASR pilot testing data to the Oregon Water Resources Department (OWRD) regularly.

Each condition outlined in ASR Limited License #026 is listed below with specific details that demonstrate the City's compliance with the conditions:

- 1) **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 the 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.*
  - The City has notified the Watermaster in writing each year at least 15 days before initiating injection and recovery.
- 2) **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.*
  - The City has kept records of the injection and recovery volumes and summarizes this data to the Department in the City's ASR annual reports. The City also submits digital copies of all electronically recorded water level to the Department as part of the annual reports.
- 3) **Modification/Revocation.** *The Department shall notify the licensee in writing and allow the licensee to respond when considering [modifying or revoking the ASR limited license, and opportunity for additional public comment].*
  - The City understands the Department will provide written notice of any changes that may be made to the ASR limited license. Requests by the City to modify the limited license have been reviewed and approved by the Department.
- 4) **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 retains the priority dates and protections of the source water rights.*
  - The City understands that the limited license does not receive a priority date like other Oregon water rights.
- 5) **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.*
  - The City has complied with all federal, state, and local permits with regard to injection of water into the aquifer and pumping to waste.
- 6) **Detailed Testing Plans.** *The Licensee shall submit a detailed testing plan for each injection well as the project develops. The plan shall include, but is not limited to, water quality and water level monitoring activities, precise well location and well construction information. The plan shall be sealed and signed*

by a professional(s), registered or allowed under Oregon law, to practice geology. 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. As the project installs new ASR wells, the Department will evaluate the water level monitoring plan's adequacy to describe the project's impact to the aquifer. If the Department determines the monitoring network is insufficient at that time, identification or installation of a dedicated observation well of similar depth and construction to the ASR well(s) will be required before approval of further testing.

- The City has submitted testing plans to OWRD for the ASR program before the start of pilot testing, and addenda outlining proposed changes to the approved testing plans. Prior to injecting at a new ASR well, the City will submit a new testing plan for ASR pilot testing at the new well.
- 7) **Well Construction.** *Injection and recovery wells shall be continuously cased and continuously sealed into a competent layer directly above the target aquifer. The wells shall meet applicable well construction standards (e.g., OAR 690-200 and OAR 690-210). Following well drilling to total depth, the wells shall be thoroughly developed to remove cuttings and drilling fluids. The licensee or their agent shall consult with a Department Hydrogeologist and the Department's Well Construction and Compliance Section before well completion to obtain approval of the proposed final casing and seal depth. The wells shall be designed to limit the irretrievable loss of injected water to unsaturated zones.*
- All well logs for the only ASR well (CROO 54191) have been submitted to OWRD, and the Department has approved the use of the well for ASR operations.
- 8) **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 provide a split of the cuttings to the Department.*
- Since the issuance of ASR Limited License #026, the City has drilled a pilot hole that will be converted into a new ASR well in the near future. The City submitted a split of the cuttings from the City's future ASR well to the Department in the summer of 2023.
- 9) **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 City's ASR program wells have Well ID Numbers that are found at each wellhead.
- 10) **Water Quality Conditions and Limits.**
- In the five years since the limited license was issued, the injection source water quality has met all state and federal drinking water standards and has not exceeded regulatory criteria for ASR, with the exception of turbidity during one source water sample (Cycle 2 pre-injection), two storage samples (Cycles 1 & 2), and one recovery sample (Cycle 2 – 100% recovery). The City's ASR system includes constant monitoring of turbidity and initiates an automatic shut-down of the system if turbidity is detected above 1 NTU.
- 11) **Water Quality Monitoring.** *The licensee shall sample and analyze water quality in the manner described in the currently approved testing plan.*
- Water quality samples were collected during each of the five years since the limited license was issued, and these results were submitted to OWRD. The City has developed a tracking table to ensure that future water quality sampling will be performed in the manner approved by OWRD.

**12) Water Level Monitoring.**

- (A) *The Licensee shall monitor water levels in wells in the manner described in the currently approved testing Plan.*
- The City monitors the water level response in the regional aquifer to ASR activities in compliance with the approved monitoring plan.
- (B) *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, or in the case of a newly drilled project well, the well shall be equipped with an unobstructed, dedicated measuring tube pursuant to Figure 200-5 in OAR 690-200.*
- The City is completing quarterly manual measurements of the monitoring well network to verify transducer data. All new ASR project wells, including monitoring wells, will be equipped with a dedicated measuring tube.

**13) 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.*
- (B) *The following two-step accounting method applies to each annual cycle:*
- (i.) *The licensee may recover up to 95 percent of the quantity injected during the same water year.*
  - (ii.) *At the end of each water year, 95 percent of the storage account balance is carried over to the next year. The storage account balance consists of the sum of water not recovered within the water year and water carried over from previous testing cycles.*
- (C) *Any water withdrawn from an ASR well identified in this license shall first be against the quantity available in the aquifer by virtue of ASR storage. When the AR storage is depleted at an ASR well, any water withdrawn from an ASR well shall be considered a draft of natural groundwater, thereby requiring separate or additional authorization. At no time does this license authorize withdrawal of more water than was credited by injection.*
- (D) *The availability of stored water us a running account that is subject to determination at any time.*
- To date, one ASR well has been installed under the City's Limited License #026.
  - The City has recovered no more than 95 percent of the stored volume each year since 2018. As required by this condition, water withdrawn from the ASR well is first debited against the quantity available by virtue of ASR storage before being considered a draft of natural groundwater. Annual reports submitted to OWRD document the total volumes of water injected, recovered, and remaining carryover storage in the aquifer each year.

**14) Use of Recovered Water.** *The licensee shall use any recovered water for the purposes described in the appropriate diversion authorization.*

- The recovered water has been put to beneficial municipal use as described in the water rights associated with the injection source water.

**15) Annual Reporting.**

- An annual report from each year of ASR pilot testing has been submitted to OWRD and have included all required data related to water quality and water level monitoring. The City has also submitted digital water level data for all ASR program wells as part of the annual reports.

**16) Protection for Existing Users.** *In the event of conflicts with existing appropriators, the licensee shall conduct all testing 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.*

- No injuries to existing groundwater users have been reported since the start of ASR activities.

17) **Other Measures.** *The licensee shall take additional measures, as appropriate, to address ASR-related issues such as landslide activation, seepage, streamflow increases, interferences 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.*

- No adverse effects have been observed, such as new seeps or landslide activation, since the start of ASR. Overall, the City continues to monitor for adverse effects resulting from ASR activities based on the approach and monitoring outlined in the approved ASR work plan.

18) **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.*

- The City has and will continue to grant access to their ASR facilities to Department staff as requested.

19) **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.*

- A running account of the volume of residual stored water has been submitted to the Department as part of the City's ASR Annual Reports.

20) **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.*

- This letter requests a renewal of ASR limited license #026 in order to extend the license for five more years.
- The reasons that further testing is necessary are discussed above, under "Reason for Renewal." The City's compliance with the terms of the license is documented in this section.

## New ASR Well Construction

The limited license authorizes five ASR wells to be used for ASR. To date, the City has only constructed and used one of those authorized wells, ASR 1 - Heliport Well Production Well (CROO 54191). The City intends to construct and bring on-line an additional authorized ASR well, ASR 2, under the limited license within the next five years.

The City understands that OWRD approval of a detailed testing plan is required before injection testing may begin at ASR 2, and that the Department may approve, condition, or reject the detailed testing plan for a given well.

## Closing

Thank you for considering this request for a five-year renewal of ASR Limited License #026. The fee of \$575 for renewal and modification of a limited license for ASR testing purposes is attached.

Please contact Bruce Brody-Heine at (971) 200-8519 with any questions.