BEFORE THE WATER RESOURCES DEPARTMENT
OF THE STATE OF OREGON

In the Matter of Aquifer Storage and Recovery (ASR) Limited License Application #026, CROOK County	))	FINAL ORDER APPROVING 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

On October 16, 2018, the Water Resources Department (Department) received an application for ASR Limited License #026 from the City of Prineville. The Department determined the application was incomplete on December 4, 2018. The application was resubmitted on December 21, 2018 and determined complete on January 18, 2019.

FINDINGS OF FACT

1. On October 16, 2018, the City of Prineville submitted an application for ASR Limited License #026. After re-submission, the Department determined it was complete on January 18, 2019.
2. The Department provided public notice of the application in the Department's weekly public notice on January 22, 2019. A 30-day comment period followed.
3. The Department sought comments and recommendations from the Oregon Department of Environmental Quality (DEQ) and the Oregon Health Authority's Drinking Water Services (OHA) related to water quality standards. Comments were received from DEQ and OHA supporting the issuance of ASR LL #026, and the license is conditioned accordingly.
4. The Department reviewed the groundwater information included with the application and found it met the application requirements as described in OAR 690-350-0020(3).
5. The Department reviewed the ASR application and testing plan. The authorization of ASR LL #026 is conditioned accordingly.
6. 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.

APPEAL RIGHTS

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

7. The Department evaluated the application and comments and determined that the proposed use is consistent with ORS 537.534 and OAR 690-350-0020.

CONCLUSIONS OF LAW

The request to issue ASR Limited License #026 to allow ASR testing for five years is consistent with the requirements of ORS 537.534 and OAR 690-350-0020.

ORDER

Now, THEREFORE, it is ORDERED, ASR Limited License #026 shall be valid for five years from issuance of this Final Order, pursuant to ORS 537.534 and OAR 690-350-0020(5).

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 accepted ASR testing plan. The plan may be modified and approved pursuant to condition (3)(A). The project schedule in the ASR testing plan may be reasonably adjusted by the licensee to reflect the license issuance date or other delays. Features of the testing plan are provided in the application documents entitled:

> GSI Water Solutions, Inc. (October 2018). Prineville Airport Area Aquifer Storage and Recovery (ASR) Limited License Application and Pilot Test Work Plan.
>
> GSI Water Solutions, Inc. (December 21, 2018). Response to Completeness Review of ASR LL #026 Application: City of Prineville.

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
- Well hydraulics at the ASR wells

The licensee may divert up to 3,000 gallons per minute (gpm) from wells in the Ochoco Creek Basin. The diversion rate shall not exceed the total diversion rate authorized for each source.

Source/ Certificate	**Point of Diversion**
One well/ Certificate 86337	CROO 1540/ Lamonta: SOUTH 58 DEGREES 13 MINUTES EAST, 1447 FEET FROM NW CORNER, SECTION 31, T14S/R16E,W.M.
One well/ Certificate 22839	CROO 50181/Yancey: 1070 FEET NORTH, 1370 FEET EAST AND 55 DEGREES AND 0 MINUTES EAST FROM S¼ CORNER, SECTION 31, T14S/R16E, W.M.

Two wells/ Certificate 83993	CROO 3132/Barney Well: 1315 FEET SOUTH AND 1370 FEET EAST FROM N ¼ CORNER, SECTION 4, T15S/R16E, W.M. CROO 2083/Stearns #2: 1810.2 FEET SOUTH AND 1151.5 FEET EAST FROM N ¼ CORNER, SECTION 4, T15S/R16E, W.M.
One well/ Certificate 87714	CROO 184/Stadium Well: 2122 FEET NORTH AND 461 FEET WEST FROM SE CORNER, SECTION 5, T15S/R16E, W.M.
One well/ Certificate 86889	CROO 2121: 375 FEET NORTH AND 370 FEET EAST FROM W ¼ CORNER, SECTION 5, T15S/R16E , W.M.
Up to 25 wells/Permit G-18154	Wells located within Section 8, T15S/R16E, W.M. : CROO 54593/D-1: 422 FEET SOUTH AND 400 FEET EAST FROM NW CORNER CROO 54587/S-1: 471 FEET SOUTH AND 406 FEET EAST FROM NW CORNER CROO 54592/D-2: 585 FEET SOUTH AND 793 FEET EAST FROM NW CORNER POD 4/D-3: 516 FEET SOUTH AND 438 FEET EAST FROM NW CORNER POD 5/S-2: 561 FEET SOUTH AND 466 FEET EAST FROM NW CORNER POD 6/D-4: 601 FEET SOUTH AND 509 FEET EAST FROM NW CORNER POD 7/S-3: 621 FEET SOUTH AND 564 FEET EAST FROM NW CORNER POD 8/D-5: 657 FEET SOUTH AND 611 FEET EAST FROM NW CORNER POD 9/S-4: 694 FEET SOUTH AND 654 FEET EAST FROM NW CORNER POD 10/D-6: 717 FEET SOUTH AND 700 FEET EAST FROM NW CORNER POD 11/S-5: 789 FEET SOUTH AND 731 FEET EAST FROM NW CORNER POD 12/D-7: 840 FEET SOUTH AND 759 FEET EAST FROM NW CORNER POD 13/S-6: 888 FEET SOUTH AND 784 FEET EAST FROM NW CORNER POD 14/D-8: 952 FEET SOUTH AND 799 FEET EAST FROM NW CORNER POD 15/S-7: 1004 FEET SOUTH AND 809 FEET EAST FROM NW CORNER POD 16/D-9: 1061 FEET SOUTH AND 815 FEET EAST FROM NW CORNER POD 17/S-8: 1116 FEET SOUTH AND 808 FEET EAST FROM NW CORNER POD 18/D-10: 1179 FEET SOUTH AND 796 FEET EAST FROM NW CORNER POD 19/S-9: 1232 FEET SOUTH AND 800 FEET EAST FROM NW CORNER

Up to 25 wells/Permit G-18154	POD 20/D-11: 1267 FEET SOUTH AND 836 FEET EAST FROM NW CORNER POD 21/S-10: 1320 FEET SOUTH AND 869 FEET EAST FROM NW CORNER POD 22/D-12: 1372 FEET SOUTH AND 879 FEET EAST FROM NW CORNER POD 23/S-11: 1420 FEET SOUTH AND 896 FEET EAST FROM NW CORNER POD 24/D-13: 1479 FEET SOUTH AND 909 FEET EAST FROM NW CORNER POD 25/S-12: 1527 FEET SOUTH AND 949 FEET EAST FROM NW CORNER
Certificate 86558/ T-13030	CROO 1577/Ochoco Heights Well 1: 1711 FEET NORTH AND 650 FEET EAST FROM SE CORNER SECTION 32, T14S/R16E, W.M. The following 4 proposed POAs are pending approval of T-13030: NEW OCHOCO HEIGHTS WELL/ NOT YET DRILLED: 1677 FEET NORTH AND 680 FEET EAST FROM SW CORNER SECTION 32, T14S/R16E, W.M. INDUSTRIAL PARK WELL/NOT YET DRILLED: 298 FEET NORTH AND 1908 FEET WEST FROM NW CORNER SECTION 31, T14S/R15E, W.M. STRYKER PARK WELL/NOT YET DRILLED: 277 FEET SOUTH AND 812 FEET EAST FROM SW CORNER SECTION 32, T15S/R16E, W.M. JUNIPER WELL/NOT YET DRILLED: 97 FEET NORTH AND 2493 FEET EAST FROM SW CORNER SECTION 32, T14S/R16E, W.M.

The licensee may store up to 870 million gallons in an aquifer within the Deschutes Formation. With the approval of individual ASR well testing plans, up to five wells may be authorized. The maximum injection rate is 1,100 gallons per minute (gpm) per well. The maximum recovery rate is 1,400 gpm per well at the same five wells. The maximum storage duration is five years under this license.

Five ASR wells may be authorized at the following locations:

Well Name	**Well Log ID**	**Well Location**
ASR 1-Heliport Production Well	CROO 54191	1070 FEET NORTH AND 1710 FEET EAST FROM THE SW CORNER OF SECTION 11, T15S/R15E
ASR 2	(not yet drilled)	1691 FEET NORTH AND 462 FEET EAST FROM THE SW CORNER OF SECTION 11, T15S/R15E
ASR 3	(not yet drilled)	2569 FEET NORTH AND 327 FEET EAST FROM THE SW CORNER OF SECTION 11, T15S/R15E
ASR 4	(not yet drilled)	1141 FEET SOUTH AND 83 FEET EAST FROM THE NW CORNER OF SECTION 11, T15S/R15E

Well Name	Well Log ID	Well Location
ASR 5	(not yet drilled)	442 FEET NORTH AND 86 FEET WEST FROM THE SE CORNER OF SECTION 3, T15S/R15E

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) **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.

2) **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 and the total metered quantity injected and recovered. The record of use may be reviewed by Department staff upon request.

3) **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 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 a 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.

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 date and protection of the source 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.

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 locations 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 the Department's approval of a detailed plan before injection testing at any 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.

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.

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.

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.

10) **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 according 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; and,

(E) If during the course of ASR testing, a constituent regulated under OAR 333-61-030 (ORS 448.131 and 448.273) or OAR 340-40 (ORS 468B.165) is detected above the 50 percent level prescribed in condition (10)(B), 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.

11) **Water Quality Monitoring.** The licensee shall sample and analyze injection, receiving and recovered water as described in the currently approved testing plan.

12) **Water Level Monitoring.**
(A) The licensee shall monitor water levels in wells in the manner described in the currently approved testing 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, 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.

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.

(D) 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 groundwater, thereby 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.

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

15) **Annual Reporting**.
(A) Except as otherwise noted, the licensee shall provide the Department a written report of the results of ASR testing for the previous water year by February 15th. The first report shall be due in 2020 and include results from water year 2019. Annual reports shall be sealed and signed by a professional(s) registered or allowed, under Oregon law, to practice geology. The report shall:

- Include the data collected during the water year
- Analyze those data to show the ASR project impacts on the aquifer
- Evaluate loss of stored ASR water and natural water by virtue of ASR activities
- Indicate the testing and development progress made under the terms of the license
- Account for the injection of stored water, withdrawals of stored and natural water, and the storage account balance at the ASR well(s)

(B) The licensee shall provide the following to the Department:

(i) 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.

(ii) 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.

(iii) 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).

(iv) Notification in the annual report of any changes in well construction.

(v) 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) **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.

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) **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.

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.

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 and conditions of the license.

Dated at Salem, Oregon on April 24, 2019.

Dwight French
Water Rights Services Division Administrator
for Thomas M. Byler, Director
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 or 503-986-0810. 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.