# Eastside Milton-Freewater Alluvial MAR and/or ASR

## Proposal Preparer(s):
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- Jim Mathieu, Northwest Land & Water

### General Description of Proposal:
Identify the category(s) and briefly explain the proposed project (e.g. location, infrastructure requirements, maintenance requirements, connection to other new, ongoing or past projects, other stakeholders, various sizing or phasing, etc.).

- **a. Water Conservation & Infrastructure**
- **X b. Aquifer Recharge & Aquifer Storage and Recovery**
- **□ c. Surface – Groundwater Source Switch**
- **□ d. Surface Water Storage**
- **□ e. Pump Exchange**
- **□ f. Water Right Transactions**
- **□ g. Point of Diversion Transfers**
- **□ h. Other**

This proposed MAR and/or ASR project entails diverting WWR water from winter to early spring (up to 10 cfs for 100 days) via the existing Eastside (Milton-Freewater) pipeline at Nursery Bridge. This water would be conveyed to a site or sites that feature a combination of infiltration galleries, spreading basins, and/or other aquifer recharge infrastructure.

The recovery of recharged water in the Eastside area from spring through summer has potential to leave up to 7 cfs of WWR water instream during the irrigation season.

### Source of Produced Water:
Mark all applicable and identify (water right number, shallow or deep basalt aquifer, stream name).

- **X a. Existing Water Right** –

  If the project is built as an MAR, it would require a new surface water right — a diversion of 10 cfs from the WWR from winter to spring. Initially, this would be achieved through a limited-license process rather than potentially migrating to a permanent water right.

  If the project is built as an ASR, some or all of the Eastside surface water right of 5–7 cfs (June – September) could be transferred to a groundwater right for the recharged shallow alluvial aquifer after the pilot period for the initially limited license. A new surface water right would be needed for the difference between 10 cfs and the transferred right rate/volume. To recovery groundwater, a groundwater right would be required if some or all of the Eastside surface water right is not transferred to the alluvial aquifer.

- **X b. Groundwater** – If the project is built as an ASR, then the recovered groundwater will be a source of summer irrigation water.
c. Surface Water – If the project is built as an ASR or MAR, then the WWR will be the source of recharge water, assuming minimum instream flows are met.

d. Other

5. Quantity/Timing/Location of Produced Water Instream: Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?

a. Acre-feet and/or Cubic-feet-per-second:

If the project is built as an ASR, up to an estimated 1,694 AF (7 cfs) will be left instream. A MAR would create an estimated 1,694 AF with instream benefits from reduced seepage loss in the WWR or direct groundwater returns to the WWR.

b. Timeframe(s): June through September

c. Stream Reach Location(s):
Walla Walla River mainstem, river mile 46.6 (Nursery Bridge, M4) and downstream

d. UNKNOWN - Is more work (engineering/design/modeling, etc.) needed to estimate potential instream flow outputs of project? Will the results of this work be available within 1 year to inform potential flow outputs? Describe additional work needed and provide cost estimates.

Additional work is needed to assess the feasibility of ASR. This work includes installing monitoring wells and conducting pilot tests to evaluate the amount of recoverable water, the timing of recovery, optimal locations for recovery wells, and the need for a pipeline upgrade or extension. The initial project design and construction costs (below) need to be refined. The amount of recoverable water will determine the instream flow outputs (benefits) of the project.

<table>
<thead>
<tr>
<th>Phase</th>
<th>MAR</th>
<th>ASR</th>
<th>Item</th>
<th>Estimated Cost Range...</th>
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<tbody>
<tr>
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<td>From</td>
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<tr>
<td>I</td>
<td>√</td>
<td>√</td>
<td>Characterization &amp; Monitoring</td>
<td>Complete</td>
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<td></td>
<td>√</td>
<td>√</td>
<td>Monitoring Wells (2 new +1 retrofit) &amp; Equipment</td>
<td>$ 20,000</td>
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<td></td>
<td>√</td>
<td>√</td>
<td>Pilot Testing Using Existing Gallery; Water Sampling / Tracking, Modeling / Analysis</td>
<td>$ 20,000</td>
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<tr>
<td></td>
<td>√</td>
<td>√</td>
<td>Development &amp; Design</td>
<td>$ 10,000</td>
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<tr>
<td>II</td>
<td>√</td>
<td>√</td>
<td>Project Land Purchase after Substantial Land “Donation”</td>
<td>$ 10,000</td>
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<td>√</td>
<td>√</td>
<td>Construction of Basins/Galleries and Soil/Water Testing</td>
<td>$ 40,000</td>
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<td></td>
<td>√</td>
<td>√</td>
<td>Pipeline Upgrade / Extension to Recharge Site &amp; Survey</td>
<td>$ 275,000</td>
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<tr>
<td>III</td>
<td>-</td>
<td>√</td>
<td>Recovery Wellfield Modeling &amp; Analysis</td>
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<tr>
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<td>√</td>
<td>Recovery Wells (5): Design, Construct, Test, Instrument</td>
<td>$ 426,250</td>
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<tr>
<td></td>
<td>-</td>
<td>√</td>
<td>Pipeline Upgrade / Extension to Recovery Wells</td>
<td>$ 550,000</td>
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</table>

Total MAR Costs $ 375,000 $ 580,000
Total ASR Costs $ 1,371,250 $ 2,406,250
6. **Ability to Protect Produced Water Instream:** Briefly explain how the produced water will be quantified, monitored and protected instream or why it is not currently protectable.

- a. **YES** - Protection under existing regulations expected to WW River mouth or in limited reach? It may be possible to exchange an existing surface water right for stored ASR water, similar to a reservoir or Columbia River Exchange project. Water would be stored underground in the Eastside subbasin and it could then be recovered in exchange for irrigators’ WWR rights (which would be left instream). Bi-state protection would be the same as for other exchange projects that are currently underway by Oregon and Washington agencies. The exchange option would require a new winter/spring water right from the WWR to allow for ASR activities and a second permit to withdraw the stored water.

  □ b. **NO**  or  X c. **UNKNOWN** – Results and implementation of flow protection study likely necessary to ensure flow protection.

7. **Cost Estimates:** Provide known and estimated costs to develop and implement the project.

   a. **Project Development and Design:**
   - Phase II for MAR and ASR, from $40,000 to $100,000 (includes small project land purchase)
   - Phase III for ASR, from $20,000 to $50,000

   b. **Project Construction:**
   - Phase II for MAR and ASR, from $355,000 to $540,000
   - Phase III for ASR, from $976,250 to $532,500

   c. **Construction cost per AF and/or CFS:**
   - MAR through Phase II recharges 10 cfs to the alluvial aquifer
   - ASR through Phase III leaves 7 cfs instream on the WWR mainstem; recovers 7 cfs for irrigation

   - Phase II for MAR from $150/AF to $220/AF
   - Phase III (extension to ASR) additional cost from $580/AF to $1,050/AF and $139K/CFS to $254K/CFS

   d. **Project Annual O&M:**
   - For MAR, ~$20K
   - For ASR, ~$60K

   X c. **UNKNOWN** - Need engineering/design work to estimate costs
   - Costs for some items in Phase II and all items in Phase III will need to be refined as the project progresses.

8. **Secured Costs:** Has any funding been secured in the past or currently and what is source?

   Yes, past and current funding has been obtained from OWEB, OWRD, and WDOE.

9. **Other Potential Project Advantages:** In addition to helping address flow targets and basin-wide flow issues (*Endangered Species Act, Tribal Water Rights, Clean Water Act, etc.*), briefly explain other potential benefits (e.g. reduced O&M costs, restores/mimics ecological processes, cropping flexibility, )

   MAR (through Phase II)
   - Provides additional winter/spring habitat for water fowl (infiltration basin)
   - MAR water adds flow to downgradient surface water bodies (needs quantification through modeling and monitoring)
• Cools down-gradient surface water bodies (Clean Water Act target)
• Has the potential to reduce O&M costs over time based on results and by rolling monitoring into a programmatic approach
• Mimics floodplain processes in a constrained alluvial fan system (WWR)
• Has the potential to benefit habitat restoration in WWR side channels and with levee setback

ASR (through Phase III)
• Same as above for MAR (through Phase II)
• Uses existing Eastside pipeline to distribute recovery water and minimizes conveyance construction impacts to residents

10. Other Potential Project Disadvantages: Briefly explain the potential drawbacks of the proposal (e.g. reduced GW supply - recharge mitigation need, increased O&M costs, legal implications)

• MAR project water, as currently operated, cannot be protected.
• There may be competition for winter/spring water supplies.

11. Project Status: Identify whether the proposed project is a past, ongoing, or new project, and briefly explain its status, including the requested role of the flow study in further consideration of the project.
   X a. NEW PROJECT       X b. ONGOING PROJECT       □ c. PAST PROJECT

Phase I, characterization and monitoring, is complete. An infiltration gallery has been set up to receive WWR water via the Eastside pipeline. This infiltration gallery, with some additional monitoring wells, would be a good pilot test to evaluate the aquifer response to infiltration, storage, and groundwater movement; if favorable, these results will further advance the viability of expanding MAR via basins or adding galleries. ASR feasibility may also be demonstrated if sufficient water is recharged during this pilot testing.

12. Estimated Time Frame to Implement Project?
Phases II will be completed in 2019. Phase III, if selected, will be completed by 2022.