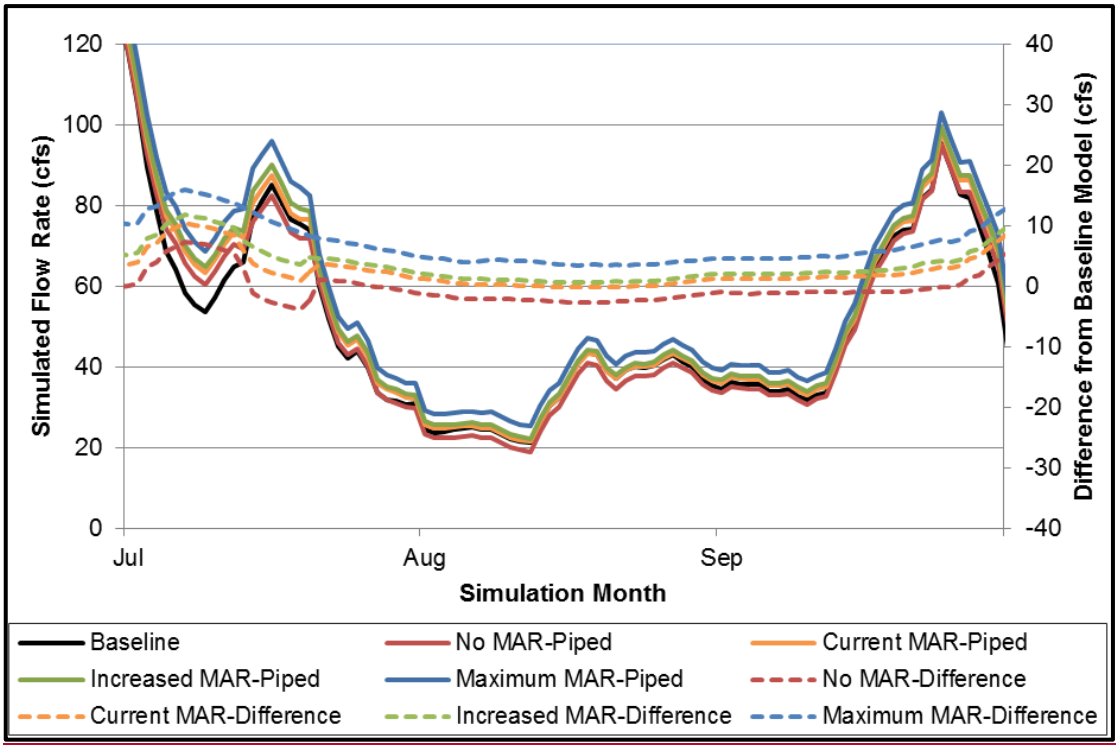
DRAFT - WALLA WALLA BASIN INTEGRATED FLOW ENHANCEMENT STUDY	
PRELIMINARY PROJECT PROPOSAL TEMPLATE	
1. Title: **Current Managed Aquifer Recharge (as of 2014)**	**2. Proposal Preparer(s):** **Steven Patten**
3. Project Status: *Identify whether the proposed project is a past, ongoing or new project and briefly explain the status of the project, including the requested role of the Flow Study in further consideration of the project. If past project, some of the questions below may not be applicable.*	
□ a. NEW PROJECT **X** b. ON-GOING PROJECT **X** c. PAST PROJECT	
4. 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 project proposal evaluation is for "Current" Managed Aquifer Recharge **(as of 2014 operations)**. This includes the 7 operational MAR sites, 5 in Oregon and 2 in Washington. Total MAR volume applied each year was estimated at 7,500 acre-feet. The information to complete this evaluation was taken from the IWFM Groundwater/Surface Water model for the Walla Walla Basin. Water rates and volumes are calculated by comparing the Current-MAR scenario to the No-MAR.	
5. Source of Produced Water: *Mark all applicable and identify (water right number, shallow or deep basalt aquifer, stream name).*	
X a. Existing Water Right – Limited License 1621 (current water right that allows MAR in Oregon), LWP 10-02, LWP 14-01, LWP 14-02, LWP 17-02 and S3-30680 (EEP Temporary Permit for Stiller Pond) **X** b. Groundwater – Increased alluvial (shallow) groundwater levels due to MAR operations. **X** c. Surface Water – Increased surface water flow during low flow periods due to increased groundwater returns, reduced seepage loss. Water for MAR sites is withdrawn from the Walla Walla River during November-May assuming minimum instream flows are met. □ d. Other	
6. 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: Numbers below indicate change in flow compared to No-MAR scenario (i.e. increase flow is due soley to MAR operations):	

Beet Road gauge = ~+1.7 cfs (average) from July to October

McDonald Road gauge = ~+2.7 cfs (average) from July-October

Touchet USGS gauge = ~+3.1 (average) from July-October (see model output below)



b. Timeframe(s):

Increased streamflows occur almost year-round, however rates vary over time. During higher flows, MAR contributions are negligible. During late spring/summer, MAR water does provide improved streamflow as well as cold water returns to the system. Groundwater returns and groundwater levels start to diminish in late September and into October. Once MAR operations restart in November, these trends are reversed.

c. Stream Reach Location(s):

MAR groundwater returns impact the mainstem Walla Walla River from Beet Road downstream and also impact lower Mill Creek, East Little Walla Walla River, West Little Walla Walla River, Mud Creek, Little Mud Creek, and Pine Creek (and its tributaries).

d. UNKNOWN -

It is very hard to measure these incremental instream returns, therefore the instream flow improvement utilizing results from the IWFM model to estimate these groundwater return amounts and locations.

7. 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

X b. NO – Currently, MAR water is not protected (OR & WA). The primary purpose of the MAR water is for public and regional benefit to restore aquifer levels and enhance/support groundwater contributions to instream flow. Some use of the improved aquifer levels is occurring at wells down-gradient of the MAR sites. If these sites were converted into Aquifer Storage and Recovery (ASR) sites, then we could apply for a second water right to recovery stored water in the aquifer.

X c. UNKNOWN - Currently, there may be potential mechanisms to protect this kind of water, however, protection of recharge water returns would need to be further researched. Examples of potential mechanisms in Washington include:

1. Postema Supreme Court decision: Ecology can utilize modeled impacts to make permitting decisions.
2. Sullivan Lake Trust ROE: Downstream water users cannot call on stored water unless they have a secondary use permit for the reservoir itself. Reservoir water is out-of-priority after filling occurs. This was a surface impoundment but the principle is the same for groundwater storage under the water code.
3. Dungeness Water Exchange: Using managed aquifer recharge to mitigate for retiming effects of new exempt wells. Using a model as a basis for basin regulation adopted in rule (173-518-070). Calling out shallow aquifer recharge as one of the mitigation strategies to be used (Dungeness Water Mitigation Plan, 2012).
4. Yakima County: Planning on MAR as part of the Yakima Integrated Plan. Pilot on Yakama Nation property already begun.
5. Lag on Groundwater In Permitting Decisions: Some trust schedules have incorporated lag time from groundwater into Ecology permitting decisions which are protected against other downstream appropriators.

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

a. Project Development and Design:
MAR site development and design* = ~$10,000/per site (previously funded)

b. Project Construction:
Typical Oregon Aquifer MAR site: ~$40,000-$50,000 (includes monitoring well)
Typical Washington MAR site: ~$100,000-$150,000 (includes 3-5 monitoring wells & SW gauges)

Current MAR scenario costs* = ~$762,000 (estimated costs for Locher Road and Stiller Pond)

*These costs have already been funded and the sites have been constructed. Costs are included for comparison purposes.

c. Construction cost per AF and/or CFS:
AF/year = ~7,500 acre-feet (includes both OR and WA sites)
CFS = ~3.1 @ USGS Touchet gauge
Cost/AF = ($762,000 [construction cost] + $4,250,000 [50 yrs O&M] = $5,012,000 divided by 375,000 [50 yrs acre-feet] =) **$13.37/AF**
Cost/CFS = ($762,000 construction costs divided by 3.1 cfs =) **$245,806/CFS**

Water Diversions:
Oregon sites = ~30 cfs to operate all 5 sites at maximum capacity from Nov 1 to May 15th (assuming instream flows are being met).
Washington sites = ~8 cfs to operate both sites at maximum capacity from Dec-May (assuming instream flows are being met).

d. Project Annual O&M:
Annual O&M for Current MAR sites = ~$85,000 (OR = ~$17,500 and WA = ~$67,375)

□ e. UNKNOWN

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

Yes, funding was secured to construct all 7 active MAR sites. Funding was provided by WA Dept of Ecology, Oregon Watershed Enhancement Board, Bonneville Power Administration, NRCS, Walla Walla Alliance, BOR and HBDIC (in-kind for operations). O&M costs are funded through the end of the WY 2017 MAR season, but are not funded beyond that for WA projects.

10. 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,)*

- Provides additional winter/spring time habitat for water fowl (infiltration basin).
- Clean Water Act, MAR water cools down-gradient surface water bodies.
- Potential to reduce O&M costs over time based upon results and rolling monitoring into a programmatic approach
- Mimics floodplain processes in constrained alluvial fans systems (WWR and Mill Creek)

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

- Project water, as currently operated, cannot be protected.
- Potential competition for winter/spring water supply (ASR, reservoir, etc).

12. Estimated Time Frame to Implement Project?

Already implemented – funding to operate MAR sites into the future (primarily WA sites).