GeoEngineers Work Plan
Non-Acquisition Water Offset Project Identification

WRIA 9 Technical Workgroup
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Background

The WRIA 9 WREC Technical Workgroup is assembling a project inventory for use as a resource for identifying projects that have the potential to offset consumptive use associated with use of new permit-exempt water supply wells. These projects have been assigned a project type that conforms to the four project type examples listed in the Final Guidance for Determining Net Ecological Benefit (Washington State Department of Ecology [Ecology] Publication 19-11-079). These project type examples include water right acquisition offset projects, non-acquisition water offset projects, habitat and other related projects, and monitoring projects.

In a separate effort, Washington Water Trust (WWT) is currently identifying opportunities for water right acquisition water offset projects in key subbasins within WRIA 9, including source switches to reclaimed water. Currently, the WRIA 9 project inventory includes numerous existing habitat and other related projects. For these, GeoEngineers has developed a work plan (under separate cover) for identifying which habitat projects have the highest water offset potential, and methods to estimate water offset from those projects (see Estimating Water Offset from Habitat Projects Work Plan).

Currently, non-acquisition water offset projects are underrepresented within the WRIA 9 project inventory, which consists largely of habitat and other related projects. However, additional analysis of these existing projects and identification of new non-acquisition water offset projects can help to build this suite of projects within the WRIA 9 project inventory.

The purpose of this work plan is to identify a process that GeoEngineers will use to identify and preliminarily evaluate non-acquisition water offset projects within the watershed. Non-acquisition water offset projects are largely centered around changes in how and when water is diverted, withdrawn, conveyed, or used to benefit streamflow and instream resources.

Project Identification Process

Project development will occur through three main phases: (1) initial identification; (2) prioritization and further analysis; (3) and development of project descriptions for projects included in the plan. Note that the WRIA 9 Technical Workgroup can recommend already identified projects for further analysis at any time (skipping phase 1 for these projects). In general, project movement from one phase to the next will only occur after the Watershed Restoration and Enhancement Committee (WREC) Committee (or Technical Workgroup) has agreed to move the project to the next phase. The intent is to avoid spending time and money working on projects that the WREC does not support. Therefore, we expect projects to move through the phases in an iterative, step-wise process, with agreement that the project should move forward.

The general content of the three phases of this work plan are summarized below.

Phase 1: Initial Identification

1. Identify contacts with key knowledge of the project type or area. Contacts could include Committee members, Technical Workgroup Members, and/or other partners.

2. Conduct a desktop screening for candidate potential project sites/areas, if necessary.

3. Work with key contacts to develop a list of preliminary concepts for non-acquisition water offset projects. Examples of non-acquisition water offset projects considered in this Work Plan fall within six primary categories:
    - Water Storage and Retiming projects.
    - Stormwater projects.
    - Modification of reservoir operations.
    - Conservation and efficiency projects.
    - Streamflow augmentation projects.
    - Source switches.

4. Track project development in a tracking sheet that tabulates attributes of the potential non-acquisition water offset projects identified within the watershed. Attributes will include: Project name; project type; project subtype; location; subbasin; project description; and preliminary estimated range in anticipated water offset.

Phase 2: Prioritization and Further Analysis

5. Work with the WRIA 9 Technical Workgroup and Committee to identify priority projects that should be further analyzed.

6. Conduct further analysis for priority projects.

Phase 3: Selection of Projects for Inclusion in the Plan

7. Develop a short (approximately 1 to 2 pages) project summary sheet for each project or action the Committee selects for inclusion in the Plan. (see draft template for water offset project descriptions in the Projects & Actions folder on box)

The sections below provide additional information about the project categories that GeoEngineers will identify and considerations specific to the respective project types. These sections also provide supplemental descriptions of tasks that will be performed during Phases 1 through 3 for the respective project categories.

Water Storage and Retiming

Water storage and retiming (or streamflow retiming) projects typically involve the diversion or capture of streamflow during a period of abundance for return to the stream during a period of need. Water storage and retiming strategies that are described in this section include the following:

1. Managed Aquifer Recharge (MAR): off-channel conveyance and infiltration of streamflow to the underlying aquifer and subsequent subsurface return to the subject stream as baseflow.

2. Off-channel storage of streamflow within an existing topographic basin to be released through surface flow to the stream during low flow periods or to be used as a substitute for an irrigation water right, allowing that volume to remain instream.

For these water storage and retiming projects, the following general procedure will be followed:

Phase 1

- ☐ Conduct a desktop screening for candidate watershed areas and facilities.
- ☐ Work with partners in WRIA 9 to develop preliminary concepts for water storage and retiming projects within WRIA 9.
- ☐ Identify the basis for the project. This will, at a minimum, include the following:
    - The potential project location.
    - The amount of water that can be stored.
    - The source, timing and rate of water diversion for storage.
    - The availability of an existing water right or feasibility of acquiring a new water right to support the project.
    - The river and reach that water storage and retiming will benefit.
    - The amount of benefit within the target river and reach.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ For identified projects, review information relevant to project feasibility. This could include:
    - The timing of additional water release.
    - The quantity of additional water release.
    - The water right(s) that will support the modification, and the associated source.
- ☐ Preliminarily evaluate water storage and retiming project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

- ☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.

Additional considerations regarding identification of water storage and retiming projects are provided below.

Managed Aquifer Recharge (MAR)

Ecology has completed an initial investigation and identification of potential MAR sites on public land in WRIA 9. These sites are identified on the committee webmap. GeoEngineers can conduct further analysis of these sites, or additional sites identified by Committee or subgroup members.

Off-Channel Storage within an Existing Topographic Basin

Because above-ground storage projects that involve embankment construction are difficult to permit and costly to engineer, construct, and maintain, project development will focus on project locations that are already impacted (e.g. gravel pits) and/or project locations that could be implemented without embankment construction. Identification of projects will also avoid areas where storage would likely negatively impact riparian habitat that supports native fish or aquatic species of concern.

Stormwater

Within WRIA 9, stormwater can be an abundant resource that typically is disposed of as rapidly as possible, whether through infiltration to groundwater or routing to adjacent drainages. Under the current stormwater disposal paradigm, a high percentage of the stormwater volume runs off to area surface water during periods of high flow. Within the context of this plan, stormwater projects involve the interception and storage of stormwater in above- or below-ground reservoirs for infiltration through the ground or release to adjacent streams during periods of lower flow. Detention ponds are designed to store water for a period of time and release stored water at a controlled rate through an outflow mechanism. Infiltration ponds are designed to dispose of stormwater to the subsurface - this infiltrated stormwater recharges shallow groundwater and, ultimately, area surface water. Stormwater projects could involve increasing the capacity and improving design of existing stormwater facilities, or siting new stormwater facilities in target locations within the watershed.

Benefits to streamflow would include additional storage above and beyond existing stormwater requirements. Potential stormwater projects will be identified and evaluated in coordination with WREC and/or Technical Workgroup members with knowledge of WRIA 9 local geography and existing stormwater operations. Projects will be identified by the following procedure:

Phase 1

- ☐ Identify contacts with key knowledge of stormwater operations.
- ☐ Work with key contacts with knowledge of stormwater operations, municipalities, and other entities in WRIA 9 to develop preliminary concepts for stormwater projects. The basis for the concepts will include the following:
    - The potential project location.
    - Stormwater interception and storage methodology.
    - Anticipated permitting requirements (and assurance that project goes above and beyond existing stormwater requirements, if applicable).
    - Stormwater treatment methodology, if applicable
    - The river and reach that the discharge will benefit.
    - The amount of benefit within the target river and reach.
    - The anticipated seasonality of the streamflow benefit.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ For identified stormwater projects, review information relevant to project feasibility.
- ☐ Preliminarily evaluate project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

- ☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.

Modification of Existing On-Channel Reservoir Operations

Reservoirs within western Washington primarily operate for hydroelectric, water supply, and/or recreational purposes. There may be opportunities for specific reservoirs within WRIA 9 to modify their operations in a manner that could provide water offset. These opportunities will be discussed at the Committee initially.

Tasks related to reservoir operation modification projects include the following:

Phase 1

- ☐ Conduct a desktop screening for candidate storage facilities that could be modified, focusing on storage facilities with less shoreline development and with facilities with aging outlet structures.
- ☐ Work with reservoir owners to develop preliminary concepts for modifications to allow for increased storage or altered timing of water release.
- ☐ For the identified reservoirs, review readily available information regarding reservoir operations, stage levels, weir operation (if applicable), seasonal variation in discharge rates, and any applicable permit requirements related to stage level or discharge.
- ☐ Based on existing information, identify the periods of the year (critical times) when high priority subbasins could benefit from additional streamflow, from an instream flow and/or fish habitat perspective.
- ☐ For the priority reservoirs, develop the associated modification in water management strategy, including how instream flow benefit will be quantified. For municipal reservoirs, it is anticipated that the reservoir owner will take the lead in developing the proposed modification in water management strategy. GeoEngineers and Ecology will assist as needed, including quantification of instream flow benefit.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ For identified reservoirs/projects, review information relevant to project feasibility.
- ☐ Preliminarily evaluate project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

- ☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.

Conservation and Efficiency Projects

Conservation and efficiency projects can reduce irrigation water use through the following means: reduce water loss through conveyance and sprinkler systems; increase the efficiency of surface water diversion structures; and increase irrigation efficiency (such as sprinkler conversion). The water offset benefit of these projects will depend on the size and type of the existing irrigation and conveyance operations. The ability of these projects to contribute water offset will be determined in coordination with Ecology on a case-by-case basis.

WRIA 9 WREC members have important knowledge of the watershed and its agricultural community. Additionally, WWT is identifying agricultural water rights that could support a conservation and efficiency project in portions of the watershed. Therefore, identification of conservation and efficiency projects within WRIA 9 will require the assistance of WREC and/or Technical Workgroup members with knowledge of the agricultural interests and other irrigators in the watershed and coordination with WWT.

Potential conservation and efficiency projects will be identified by the following procedure:

Phase 1

- ☐ Conduct a desktop screening for candidate land areas, if needed. This desktop screening could incorporate agricultural water rights identified by WWT or by the applicable conservation district, as a basis for increasing the efficiency of the screening exercise.
- ☐ Identify contacts with key knowledge of agricultural operations and/or other large irrigators within the watershed and solicit their input on conservation and efficiency project identification.

Conservation and efficiency within a municipal setting is already required under RCW 90.03.386(3) and, therefore, will not be considered herein.

- ☐ Develop a list of preliminary concepts for conservation and efficiency projects and potential project locations. We anticipate that these concepts could include:
  - Water loss reduction.
  - Irrigation technological modifications, such as sprinkler improvements.
  - Diversion modifications.
- ☐ Conduct outreach communications to relevant agricultural operators to gauge their interest in participating in the project.
- ☐ Gather pertinent information for the identified projects, which could include the following:
  - The potential project location.
  - The existing water right proposed to be modified and the original point of diversion.
  - The acquisition and placement of the conserved portion of the water right in trust for instream flow, where applicable.
  - Existing water use and conveyance infrastructure within the project area.
  - The river and reach that will benefit.
  - The amount of benefit within the target river and reach.
  - The anticipated seasonality of the conservation and efficiency project.
  - The specific conservation/efficiency technology or technique that is proposed for the project.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ Based on the compiled information and project-specific design, work with WREC and or Technical Workgroup members to estimate the quantity of water offset that can be anticipated for the identified projects.
- ☐ For priority projects, review information relevant to project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

- ☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.

Streamflow Augmentation

Streamflow augmentation projects generally are centered around the release of water from an alternative source to a target stream to increase streamflow. Several alternative water sources could underpin streamflow augmentation projects, including the following:

1. Groundwater.
2. Reclaimed water.
3. Surface water/piped water.

For each of these sources, streamflow augmentation projects will be identified through the following procedure.

Phase 1

- ☐ Conduct a desktop screening for candidate facilities and/or watershed locations.
- ☐ Work with partners in WRIA 9 to develop preliminary concepts for streamflow augmentation.
- ☐ Identify the basis for the project, as described below for the water source alternatives.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ For identified projects, review information relevant to project feasibility.
- ☐ Preliminarily evaluate streamflow augmentation project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

- ☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.

Additional considerations associated with specific streamflow augmentation sources are summarized below.

Groundwater

Groundwater pumped from an aquifer that is not in direct hydraulic connection with the subject stream could be discharged to the stream to augment streamflow during low-flow periods. For groundwater-based streamflow augmentation projects, the following project characteristics will be identified:

- ☐ The potential project location.
- ☐ If applicable, the associated existing water right to be modified and the point of diversion.
- ☐ The river and reach that the discharge will benefit.
- ☐ The amount of benefit within the target river and reach.
- ☐ The anticipated seasonality of the streamflow augmentation.

Reclaimed Water[1]

For a reclaimed water-based streamflow augmentation project, reclaimed water from a municipal source (treated to a Class A standard) is discharged to adjacent streams during a period of low flow, infiltrated into the ground to improve base flows, or provided to a water user directly to offset an existing water use thereby leaving their volume of water undiverted. This work plan anticipates that these projects would utilize an existing source of reclaimed water, rather than a new facility. GeoEngineers will coordinate with Ecology to identify feasibility of projects involving reclaimed water. For reclaimed water, the following project characteristics will be identified:

- ☐ The potential project location.
- ☐ Whether the facility currently discharges to Puget Sound, and is subject to associated limitations on the seasonality of reclaimed water discharge.
- ☐ Whether the reclaimed water is already needed for other uses.
- ☐ The water right that is being replaced and associated water right quantity, if applicable.
- ☐ Reclaimed water treatment methodology and maximum contaminant concentrations at time of discharge.
- ☐ Permitting requirements.
- ☐ The river and reach that the discharge will benefit.
- ☐ The amount of benefit within the target river and reach.
- ☐ The anticipated seasonality of the streamflow augmentation

[1] Reclaimed water could potentially be used for a number of different water offset project types, but opportunities will depend on a number of factors, including the location and capacity of the facility.

Surface Water/Piped Water

For surface water/piped water the following project characteristics will be identified:

- ☐ The potential project location.
- ☐ Proximity of infrastructure to priority stream.
- ☐ If applicable, the associated existing water right to be modified and the point of diversion.
- ☐ Quality of water at time of discharge and whether additional treatment is needed.
- ☐ Permitting requirements.
- ☐ The river and reach that the discharge will benefit.
- ☐ The amount of benefit within the target river and reach.
- ☐ The anticipated seasonality of the streamflow augmentation

Source Switches

Projects within this category change the source of withdrawal to benefit streamflow and/or improve system efficiencies. Source switches can also improve water quality, reduce operations and maintenance (O&M) costs, and improve system resiliency for water users. While surface water to groundwater source switches have water offset benefits, currently this type of source switch is generally difficult to permit due to impairment to instream flows that occurs when the source switch changes the timing of impacts to surface water bodies. Source switches from shallow to deep groundwater wells also frequently result in impairment to instream flows.

Potential source switch projects will be identified and evaluated in coordination with WREC and/or Technical Workgroup members with knowledge of WRIA 9 agricultural/commercial/municipal operations that could support switching the source of water from an existing surface water body to an alternate surface water body, or switching the source to another viable source (e.g. stored water). Washington Water Trust is identifying potential source switches to reclaimed water. Projects will be identified by the following procedure:

Phase 1

- ☐ Identify contacts with key knowledge of agricultural/commercial/municipal operations within the watershed and solicit their input on source switch project identification.
- ☐ Work with key contacts with knowledge of agricultural/commercial/municipal interests and other parties in WRIA 9 to develop preliminary concepts for source switch projects. The basis for the concepts will include the following:
    - The potential project location.
    - The associated existing surface water right proposed to be modified and the original point of diversion.
    - The alternative water source and the proposed point of diversion.
    - The river and reach that the source switch will benefit.
    - The amount of benefit within the target river and reach.
    - The anticipated seasonality of the source switch.

Phase 2

- ☐ Bring potential projects to the Technical Workgroup for discussion.
- ☐ For identified projects, review information relevant to project feasibility. This could include:
    - The apparent validity of the existing water right.
    - The alternative water source and associated existing water users/rights.
    - Any restrictions on new water use associated with the alternative water source.
    - Potential conservation and efficiencies that could be gained with source switch.

- Other information applicable to the specific project.

☐ Preliminarily evaluate source switch project feasibility. For this level of study, feasibility evaluation primarily will be limited to the identification of clear fatal flaws associated with the project concept.

Phase 3

☐ Develop a short project summary sheet for each project the Committee selects for inclusion in the Plan.