

# **Tualatin Basin Water Supply Feasibility Study (WSFS) Supply Options Evaluation Summary**

**Revised 9/03**

The purpose of the Water Supply Feasibility Study (WSFS) is to evaluate reliable, safe and cost-effective water supply options to meet the long term water needs of the Tualatin Basin community. The study began in November 2001 as a collaborative effort led by Clean Water Services in cooperation with the Bureau of Reclamation and local water providers.

## **Background**

A series of water supply studies set the stage for the WSFS. In the early 1990's the Regional Providers "Phase I Source Options Study" evaluated 29 different new water source options (options list attached in Appendix A). Expansion of Hagg Lake was not included in this study.

Phase II of the Regional Water Supply Plan (RWSP), adopted in 1996, detailed how to meet regional 2050 water supply needs and added conservation to the supply options recommended in Phase I.

The Integrated Water Resources Management Strategy (IWRM), completed in 2001, is a cooperative approach among water resource agencies in Washington County for addressing a range of water issues. A priority IWRM action is to ensure a long-term water supply to meet future basin needs. The IWRM strategy estimated that the Tualatin Basin would face supply shortfalls by 2050

## **WSFS Source Options Screening**

The current Tualatin Basin WSFS is the next step of the IWRM. Using the comprehensive list of potential sources from previous studies and input from a scoping process in early 2002, a set of options were identified for more detailed evaluation.

The following options were carried forward.

- **Water conservation.** Programs and policies that reduce the demand for municipal/industrial and agricultural water supplies.
  
- **Wastewater reuse.** Infrastructure to distribute treated wastewater for irrigation, primarily for non-food crops. Reuse would result in a reduction in demand in the municipal/industrial and agricultural sectors.
  
- **New Tualatin Basin storage.** Includes several specific options:
  - **Scoggins Dam raise.** Constructed dam raise would result in a larger pool behind the dam and increased storage.
  - **New in-line storage on a Tualatin River tributary.** New dam on a tributary, similar to the existing Scoggins Dam.
  - **Off-line storage on a Tualatin River tributary.** Water impounded away from tributaries in the high flow season and pumped back to the tributary during low flows to satisfy in-stream water needs only.
  - **Stimson Dam.** New dam below Scoggins Dam and upstream from Stimson Lumber Mill.

- **Aquifer storage and recovery (ASR).** Injecting treated drinking water into underground aquifers during low demand periods and pumping it to provide supplemental peak use supply. Assumed to satisfy municipal needs only.
- **Bull Run System Contracts.** Two scenarios: Near-term (by 2020) expansion of supply capacity through filtration treatment and a raise of the existing Bull Run Dam Number 2; and construction of a third dam in the Bull Run watershed. Either requires a new transmission pipeline to Washington County and is assumed to satisfy municipal needs only.
- **Irrigation Exchange Pipeline from the Willamette River.** Raw water pipeline from the Willamette River pumped for Tualatin Basin agricultural irrigation use. Provided to Tualatin Valley Irrigation District (TVID) in lieu of the Hagg Lake storage making that water available for municipal and in-stream use.

### **WSFS Source Options Evaluation**

The Washington County Water Manager’s Group (WVG) evaluated these options based on criteria developed from prior studies. Comments received from the Tualatin River Watershed Council, Clean Water Advisory Council and the general public also helped shape the following evaluation criteria list.

#### **Evaluation Criteria**

- |                                           |                                  |
|-------------------------------------------|----------------------------------|
| • Cost                                    | • Recreation                     |
| • Institutional and financial feasibility | • Flood control                  |
| • Legal and regulatory feasibility        | • Environmental impact           |
| • Supply reliability                      | • Timeliness                     |
| • Emergency reliability                   | • Property rights preservation   |
| • Efficiency                              | • Security from intentional harm |
| • Water quality                           |                                  |

The objective of the screening process was to identify source options that rated poorly in terms of their ability to meet the criteria. These source options were not recommended for further WSFS analysis. It should be noted that source options not being carried forward in the WSFS may be revisited in the future.

Based on this evaluation, the WVG made the following recommendations for further WSFS detailed analysis.

#### **Source Options Not Recommended for Further Study**

These options were ruled out, primarily due to high cost or impact to private property:

- **Stimson Dam** – New dam has the advantage of providing same amount of storage as 40 foot Scoggins raise with impacts similar to 20 foot raise and potential for meeting fish passage requirements on a new facility better than retrofit of existing dam.  
Main disadvantages are high cost per acre foot of new storage compared to the Scoggins Dam raise options, impacts to fish habitat, Stimson operations and relocation of access roads.

- **New in-line tributary storage** – Storage sites throughout the basin have been studied for years and have been rejected for multiple reasons including high cost, water availability, feasibility, environmental and property impacts, and water rights conflicts.
- **Off-line tributary storage** – Only useful to meet in stream flow needs. Significant drawbacks include area-intensive footprint, cost and competition with existing land use, and impacts to private property.
- **Bull Run Dam #3** – This source option is being evaluated in a regional context as part of the RWSP Update, now underway. Information will be considered as it becomes available. This source option has the disadvantage of not increasing the diversification of the region’s water supplies.

Qualitative Assessment of Source Options Not Recommended for Further Evaluation

Source Option	Cost	Inst./Financ. Feasibility	Legal/Reg. Feasibility	Supply Reliability	Emerg. Reliability	Water Quality	Recreation	Flood Control	Env. Impact	Timing	Property Impact	Security
Stimson Dam	□	□	▴	▴	■	■	■	▴	■	▴	▴	▴
New In-Line Storage	□	□	□	■	■	■	▴	▴	□	□	□	▴
Off-Line Storage	□	□	□	▴	□	■	□	□	□	□	□	□
Bull Run Dam 3	will be evaluated in RWSP Update											

■ = good      ▴ = fair      □ = poor

**Source Options That Should Be Components of All Supply Alternatives**

These options were perceived as strongly positive in one or more evaluation criteria and should be considered as part of any overall water supply strategy.

- **Water conservation** – Reducing per capita demand is an ongoing goal. Water use in the Portland area peaked in the 1980’s and has been dropping ever since (estimated to be a 20 percent drop). An 8% Washington County demand reduction assumption has been made for this analysis. Potential supply – 7,600 AF/year\*\*\*  
(\*\*\*based on updated information, the yield is reduced to 5,000 AF/year)
- **Wastewater reuse** –Based on Clean Water Service’s Recycled Wastewater Master Plan, WSFS assumes that a modest level of reuse will be achieved by 2050. Potential supply – 3,500 AF/year\*\*\*  
(\*\*\*based on updated information, the yield is reduced to 1,000 AF/year)

- **Aquifer storage and recovery** – Several Tualatin Basin water providers have tested, or are currently testing, ASR. WSFS assumes 10 MGD will ultimately be developed including 4.5 MGD being developed by Beaverton. Potential supply – 5,500 AF/year (M/I use only).
- **Near-term Additional Supply from Portland** - Assumes that Portland will continue to provide water and that additional water may become available to the Westside by 2020. New transmission pipeline will be required. Potential supply – 9,200 AF/year (M/I use only).

**Source Options Recommended for Further Study**

- **No Action** – This scenario considers the impact of no increase in water supply on flow and water quality, on irrigated agriculture and on municipal/industrial demand in the Basin.
- **Scoggins Dam Raise (20 feet)** – Raise would increase Hagg Lake storage but would not be adequate to meet projected 2050 water needs unless combined with conservation, reuse, and/or ASR. Potential supply – 26,500 AF/year.
- **Scoggins Dam Raise (40 feet)** - Raise would increase Hagg Lake storage to meet 2050 projected need. WSFS will study the environmental impacts of any dam raise, as well as impacts to property and park facilities. Potential supply – 50,600 AF/year.
- **Irrigation Exchange Pipeline from the Willamette River** – Trading Willamette River water for TVID irrigation supply in Hagg Lake. WSFS will study the engineering feasibility, cost and environmental impacts of the roughly 18 mile irrigation pipeline. Potential supply – 25,000 AF/year. (M/I and in-stream use only)

Qualitative Assessment of Source Options Recommended for Further Evaluation

Source Option	Cost	Inst./Financ. Feasibility	Legal/Reg. Feasibility	Supply Reliability	Emerg. Reliability	Water Quality	Recreation	Flood Control	Env. Impact	Timing	Property Impact	Security
No Action	■	■	▣	□	□	□	▣	▣	▣	■	■	▣
Scoggins Dam Raise - 20'	▣	■	▣	▣	▣	▣	■	▣	▣	▣	■	▣
Scoggins Dam Raise - 40'	▣	▣	▣	■	■	■	■	■	▣	▣	▣	▣
Irrigation Exchange Pipeline	▣	□	▣	▣	■	■	▣	□	▣	▣	□	▣

■ = good      ▣ = fair      □ = poor

# Attachment A

## **Water Source Options List Generated by the WMG and TRWC:**

The following list was developed by these groups in the course of planning meetings conducted during the IWRM project. The list is the result of brainstorming exercises conducted by the groups, and is not intended to be a comprehensive or prioritized evaluation of water supply.

- Willamette River:
  1. trade for Hagg Lake storage
  2. use for irrigation
  3. use for municipal supply
- Bull Run:
  1. Another Dam In Bull Run
  2. Purchase more surplus
- Increased Tualatin River withdrawals
- Raise Hagg Lake
- Deepen Hagg Lake/Dredge Hagg Lake
- Side-System Storage On Tributaries
- Off-Stream Storage
- Build Another Dam On Tualatin
- Deepen Tualatin River Channel
- Additional Groundwater Use
- Aquifer Storage and Recovery (ASR)
- Yamhill River
- Columbia River
- Storm Water System Collection
- Snow Making Machines
- Cloud Seeding
- Fill In Lake Oswego
- Drain Lake Oswego Every Year & Reuse/Recycle Water
- Bunkers - Underground Storage
- Trucking Snow
- Create Water (Scientific Manner)
- Screening To Prevent Evaporation
- Icebergs
- Desalination
- Deep Tunnel
- Two-Way Pipe To Willamette River/Columbia River
- Put In Pump At Mouth Of Tualatin & Circulate Back
- Subsidize Reuse
- Using Effluent For Groundwater Recharge
- Reuse Back To Hagg Lake/Barney
- Non-Potable Distribution Systems
- Developing Extensive Grey Water
- Potable Reuse
- Multiple Recycling
- Required Reuse
- Dual Distribution For Reuse & Potable