

# Region 2050 Alternative Growth Scenarios Evaluation: Water Supply and Facilities Draft March 17, 2005

This summary evaluates the extent to which each scenario meets the Regional Goal and Objectives related to public facilities and services. Specifically, this evaluation assesses the relative impacts of the three scenarios on the capacity and cost to provide water supply and water facilities.

## Summary of Findings

### All Scenarios

- ✚ Coburg, Junction City, Springfield, Oakridge, and Veneta and all rural residents depend on ground water as their sole source of drinking water. Eugene, Cottage Grove, Lowell, and Westfir rely on surface water for their respective drinking water sources. Creswell uses surface water from the Willamette River, in addition to ground water. Coburg, Eugene, Junction City, Springfield, and Veneta have prepared drinking water protection plans.
- ✚ Water is not uniformly available throughout the region due to senior water rights, water quality issues, and competing demands on the resource. Agriculture competes with municipal demand in Junction City and Coburg, fish bearing streams and tributaries are more restrictive in terms of municipal water availability, and sections of the region have specific water quality issues. Arsenic is a potential limiting factor in and around Cottage Grove, Lowell, Lorane, and in general along the east side of the valley south of Eugene where there are western Cascades volcanics. Nitrates are an issue in the northern part of region in and around Coburg and Junction City. There is high saline potential associated with marine sedimentary rock on the western side of the region around Veneta.
- ✚ State agencies that regulate water use encourage sharing of the resource, a viable and legal option that could allow growth in areas where it would otherwise not be feasible due to limited water supply.
- ✚ By the year 2050, water quality and quantity will most likely be regulated in an integrated watershed approach by local, state and federal agencies. This is especially significant in the Compact and Satellite Scenarios where municipalities are subject to National Environmental Policy Act (NEPA) requirements and thus eligible for federal loan monies.
- ✚ Regional collaboration and agreement on a growth strategy will give all of the local governments a technical knowledge base and political clout that will strengthen the region's case in requesting state and federal assistance for implementation, including state and federal funding, approval of water plans that are consistent with

the strategy, and changes in federal policy related to the availability of stored water for municipal drinking water use.

## Scenario Comparisons

Table 1 displays the water system capital costs and capacity issues in providing water service in each scenario.

- ✚ The Compact Growth Scenario would be the most reliable in terms of ease of providing water service and predictability of supply. Water availability in the Satellite Scenario would also be highly reliable except in Creswell, Veneta, and Coburg where water supply presents a major limitation to growth. This limitation could be overcome if EWEB supplied water to these areas; the issue for these cities would then be cost rather than availability. Reliability and predictability in the Rural Scenario would be low due to the lack of a centralized source and distribution system.
- ✚ Cost predictability would be highest in the Compact Scenario due to the staff capacity in the large cities; somewhat less in the Satellite; and low in the Rural Scenario.
- ✚ The Satellite Scenario would have the lowest total capital costs, the Rural would have the second lowest and the Compact would have the highest, due to the significant cost of extending lines to Alvadore, Goshen, and Pleasant Hill. However, the limitations on water availability noted above would most likely result in increased costs to serve specific areas in the Satellite Scenario.
- ✚ The municipal systems in both the Satellite and the Compact Scenarios would have greater efficiency in service delivery and greater protection of the public health than the Rural Scenario due to the lack of centralized administration, operations and maintenance, high power costs, and lack of regulated protections in the rural areas in the Rural Scenario.
- ✚ The Compact and Satellite would have high system reliability and the Rural would have low reliability due to the lack of treatment and testing administration and monitoring and the unpredictability of water in the Rural Scenario and the potential for groundwater contamination or impaired ground water quality.

## Methodology

This assessment reflects the results of a quantitative and qualitative evaluation conducted by the Water Evaluation Team. The team includes staff representing the local governments, LCOG, local government engineering consultants, public utilities and water district, Oregon Water Resources Department, Oregon Department of Environmental Quality, Oregon Health Division, Army Corps of Engineers, and a consulting hydrologist (see attached meeting notes for the list of participating staff). In

**Table 1. Water System Capital Costs and Capacity Issues to Serve 2050 Alternative Growth Scenarios, March 14, 2005 (For Scenario Comparison Purposes)**

Service Area	Service Area Population		Compact Urban Scenario		Satellite Scenario		Rural Growth Scenario		Additional Water Rights Needed?		Issues
	Current	Current System Capacity	Population	Cost to Serve	Population	Cost to Serve	Population	Cost to Serve	Surface	Ground	
Eugene	160,514	167,832	252,689	\$257,783,553	212,248	\$139,173,731	193,393	\$89,412,578	No	No	Major transmission lines needed to serve three new growth areas in Compact Scenario, adding significant costs. Obtaining and extending water rights and applications will be needed for some areas in all scenarios.
Springfield/Rainbow	61,989	68,356	112,103	\$107,218,000	83,800	\$33,677,800	84,102	\$35,345,000	Yes	Yes	New rights needed to serve all scenarios. Equivalent population of 68,103 would require expansion of treatment plant and/or drilling new production wells.No physical obstacles block any of the scenarios.
Coburg	969	1,000	5,827	\$3,000,000	5,984	\$3,000,000	5,878	\$3,000,000	Maybe	Yes	All scenarios will require new groundwater rights and perhaps surface water rights. Issues in serving all scenarios will be adequate supply and source quality with regard to groundwater quality and vulnerability, particularly nitrates and costs associated with surface water alternatives. Additional storage will also be required. Costs are for current capital upgrade associated with 20-year water master plan.
Cottage Grove	8,890	13,375	16,148	\$21,038,302	26,501	\$23,588,302	14,723	\$21,038,302	No	No	All scenarios will require major capital investments, such as additional storage, expansion of water treatment plants, new lines to serve different areas, etc.
Creswell	3,909	7,480	14,920	\$3,953,300	22,858	\$6,537,682	5,795	\$1,339,248	Yes	Yes	Water supply presents a major limitation to growth. This limitation could be overcome if EWEB supplied water to these areas; the issue for the City would then be cost rather than availability.
Junction City	4,910	6,000	9,128	\$10,989,924	12,524	\$15,078,645	8,465	\$10,191,690	No	No	City will need to transfer some existing water rights to new points of diversion.
Lowell	857	1,100	2,368	\$1,200,000	2,845	\$1,200,000	2,359	\$1,200,000	Yes	No	City has surface water rights of 1cfs from Dexter Lake and .44 cfs from wells. Under the Satellite, Lowell would need to acquire additional surface water rights or treat well water for arsenic.
Oakridge	3,246	9,500	7,895	\$3,947,500	13,939	\$6,969,500	7,136	\$3,568,000	No	No	System in need of major capital investments; new wells are the least expensive of the needed improvements. No issues in serving Compact and Rural Scenarios; Satellite may take additional storage that is in the Oakridge Water Plan.
Veneta	3,480	5,727	14,110	\$4,900,000	24,016	\$7,800,000	10,002	\$2,900,000	No	Yes	New groundwater rights needed in all scenarios.Need for new wells is dependent on capacity of each previous new well. Compact Scenario would require adding 5 wells; the Satellite, 8 wells, and the Rural, 3 wells. City may have problems obtaining groundwater rights, well sites, and land on which to build water treatment facilities within the City.
Westfir	287	287	546	\$115,000	564	\$115,000	544	\$115,000	No	No	No problems anticipated in providing water services under each of the scenarios.
Pleasant Hill Growth Center	230				11,777	\$19,628,333					Community/municipal water system assumed in Satellite Scenario only. New surface and/or groundwater rights may be needed to serve Satellite.
Goshen Growth Center	543				10,180	\$16,966,666			Yes	Yes	Community/municipal water system assumed in Satellite Scenario only. New surface and/or groundwater rights would be needed to serve Satellite.
Alvadore Growth Center	309				16,027	\$26,711,666			Yes	Yes	Community/municipal water system assumed in Satellite Scenario only. New surface and/or groundwater rights would be needed to serve Satellite.
Outside UGBs**	56,733	56,733	27,766	\$6,500,000	20,237	\$6,500,000	131,103	\$201,418,750	No	No	1,000 new dwelling units assumed in rural area in Compact and Satellite, although more of the existing units are absorbed in UGBs in the Satellite. Cost of private water systems based on an average of \$6,500 per system in rural area multiplied by the number of new dwelling units in scenarios. Individual wells are currently exempt from water right permit requirements, although water supply and quality may limit water availability at specific locations in Rural Growth Scenario. Lane Code 13.050(13) guides construction and development of rural land as it relates to water supply. No construction or development work on proposed lots or parcels shall be started until water availability and quantity information is submitted and approved. Sufficient evidence is necessary to show that each parcel or lot to be developed will have available an adequate supply of potable water which will meet minimum County standards for drinking water..
<b>Totals</b>	306,866	337,390	463,500	\$420,645,579	463,500	\$306,947,325	463,500	\$369,528,568			

\*Assumes 40% contingency for municipal systems except on transmission.

\*\*Sources: Joe Loving, Mid Valley Drilling; Del Page, Del Page Well Drilling, Inc.



addition, professional well drilling companies provided assistance and expert opinion on the costs for domestic water systems.

The evaluation measures the capacity to serve based on water availability and status of water rights; and capital cost based on cost to expand individual systems to serve increased housing, employment, and land area in the scenarios. The approach includes administering a survey sent to all providers in the region. The attached survey was used to estimate of the cost of providing water services for each of the three alternative growth scenarios.

### **Expert Water Panel**

A preliminary draft assessment was prepared based on a literature search and survey results. The Draft Assessment was reviewed by a panel of federal, state and local water experts to address the broader issue of water availability in the region in the future and to provide specific feedback on the draft evaluation. Two meetings of the Expert Panel were held (March 3 and March 9, 2005). The meeting agenda and meeting notes are attached to this paper.

## **Assumptions**

### **Assumptions for Water Systems: Municipal, Water District and Private Water Companies**

- The State requirements for securing surface water and ground water rights remain the same.
- The existing technology and legal requirements for municipal water systems remains about the same.
- Current levels of consumption remain about the same, although some reduction is expected due to new conservation measures.
- The laws relating to serving only within defined service boundaries, (whether water districts or city limits), remain the same.
- All costs are shown in 2004 dollars.

### **Assumptions for Domestic Water Systems Not Served by Municipal, Water District or Private Water Companies**

- Existing health standards may become more stringent and will still be applied to domestic wells.
- The existing technology will improve, both for collecting water on a site and for filtering contaminants.

- Current levels of consumption remain about the same, although some reduction is expected due to new conservation measures.

## **Criteria**

The evaluation is based on the following Regional Goals and Objectives.

### **Goal**

Develop a regional approach to facilitate the efficient provision of infrastructure and community services in the Southern Willamette Valley in conformance with the desires of each utility and district.

### **Objectives**

1. Work collaboratively to ensure the availability of a full range of infrastructure and services to meet the needs of all residents in the region.
2. Identify innovative strategies and partnerships to finance existing and future facility expansions and improvements.
3. Develop a regional strategy to place less demand on infrastructure through enhanced conservation policies and practices.

## **Water Supply and Facilities Assessment**

### **Background**

The quality of life in the region is directly related to the quality and availability of water for drinking, irrigation, and industry. This evaluation provides a discussion and analysis of issues facing the region with regard to water supply, use, and quality.

Residents and businesses throughout the region rely on clean and available water from both ground and surface water sources. Residents of Coburg, Junction City, Springfield, Oakridge, and Veneta and all rural residents depend on ground water as their sole source of drinking water. Eugene, Cottage Grove, Lowell, and Westfir rely on surface water for their respective drinking water sources. Creswell uses surface water from the Willamette River, in addition to ground water. Coburg, Eugene, Junction City, Springfield, and Veneta have prepared drinking water protection plans.

An unconfined aquifer underlies most of the region supplying relatively clean and plentiful ground water. Ground water quality within the region is currently within acceptable limits for most existing uses with only disinfection required to meet drinking water quality standards. However, there are localized problems with low well productivity, water hardness, contamination, and lack of sanitation. Some wells produce high levels of nitrate or concentrations of arsenic that are unsafe for human

consumption. The northern portion of the region, including the Coburg and Junction City areas, has been designated a Ground water Management Area due to high concentrations of nitrate. Ground Water Management Areas are regulated by the Oregon Department of Environmental Quality (DEQ).

Toxic, arsenic-rich ground water is apparently associated with the volcanic ash portion of the Fisher Formation. Wells yielding arsenic-rich ground water have been noted in the Spencer Creek area; north and west of Creswell; and near Cottage Grove. Arsenic is also found west of Westfir, northeast of Marcola, along Highway 58 to Lowell, and near Culp Creek. Future regulations relative to permissible arsenic levels in drinking water could also have an impact on the cost and future capability of some municipal water systems.

The McKenzie River supplies some of the cleanest drinking water in the Pacific Northwest, but temperatures potentially affect fish and other aquatic life. The Willamette River continues to be a source for municipal drinking water by a number of cities as it makes its way to Portland, although water quality in the Willamette River is threatened. The Coast Fork, Middle Fork and Main Stem of the Willamette are considered “water quality limited” for temperature and mercury. The Coast Fork, Main Stem, and Long Tom are also “water quality limited” for bacteria. The DEQ is currently finalizing Total Maximum Daily Load (TMDL) allocations for mercury, bacteria, and temperature for the Willamette Basin. DEQ and federal agencies are continuing efforts to address point and non-point sources of pollution in the Willamette Basin.

Although the region’s location in the maritime northwest means abundant rainfall, the demand for water could result in a deficiency of the resource over the next 50 years. With growth of the population, irrigated agriculture, and industry, demand for consumptive use of water has and will continue to increase. At the same time, increasing use of the resource by recreation and the need to maintain or enhance fish habitat argues for less consumption. The increased human activity in the region heightens the risk that the resource will be polluted and may require additional levels of treatment to meet drinking water requirements with associated increased costs.

At the same time, available water supplies are expected to decline due to climate changes. As discussed in the “Scientific Consensus Statement on the Likely Impacts of Climate Change on the Pacific Northwest,” between 1950 and 2000, snowpack across the Pacific Northwest declined; scientists are very certain (90-99% chance) that the Pacific Northwest is warming and that since 1975 the warming is probably best explained by human-caused changes in greenhouse gases.

Scientists have intermediate certainty (33-66% chance) that average temperatures in the Pacific Northwest will continue to increase in response to global climate change and they predict that spring snowpack will continue to decline in many areas, resulting in further losses of natural water storage in the mountains. Mid-elevation areas will, in

general, experience impacts sooner than high-elevation areas.<sup>1</sup> In many river basins (especially those characterized by a mix of winter precipitation and those dominated by snowmelt), winter streamflow will increase, summer streamflow will decrease, and peak flows will occur earlier in the year. Impacts to water resources may include decreased summer water availability, decreased low flows in late summer, increased flood risks in winter, reduced summer hydropower capacity, higher water temperatures, and increased pollutant concentrations in late summer.

The link between long-range land use planning and the ability of the water resources to serve future needs is critical, due to competing demands on water and on the agencies that manage it and to the almost certain climatic effects on the resource over the next 50 years. The authority for managing water use resides at the state and federal level. The region's local governments and utilities have no direct influence over management of the resource itself, but land-use decisions at the local level do affect the issues of water supply and quality.

Particularly relating to ground water, gaps in state authority can result in unsustainable use of the resource (over appropriation); and local land-use decisions can aggravate the situation if the issue is not addressed. The issue of exempt ground water use highlights the difficulty in managing the resource at a regional level. New rural development relies on individual exempt ground water wells as the water supply. Although statewide planning goals indicate a need for local government to consider water availability as part of the approval process, there is lack of ground water expertise and ground water data for this region. If the Department of Water Resources does not formally restrict ground

<sup>1</sup> On June 15, 2004, a subcommittee of participants in the scientific meeting "Impacts of Climate Change on the Pacific Northwest" convened at Oregon State University and drafted the "Scientific Consensus Statement on the Likely Impacts of Climate Change on the Pacific Northwest." Participants were primarily scientists working in a variety of fields related to climate change in the Pacific Northwest, such as oceanography, forest ecology, forest economics, agriculture and resource economics, hydrology, paleoclimatology, marine ecology, fisheries biology, estuarine ecology, population biology, geography, ornithology, climatology, and meteorology.

<b>Box SPM-1</b>	<b>Confidence and likelihood statements.</b>
<p>Where appropriate, the authors of the Third Assessment Report assigned confidence levels that represent their collective judgment in the validity of a conclusion based on observational evidence, modeling results, and theory that they have examined. The following words have been used throughout the text of the Synthesis Report to the TAR relating to WGI findings: <i>virtually certain</i> (greater than 99% chance that a result is true); <i>very likely</i> (90–99% chance); <i>likely</i> (66–90% chance); <i>medium likelihood</i> (33–66% chance); <i>unlikely</i> (10–33% chance); <i>very unlikely</i> (1–10% chance); and <i>exceptionally unlikely</i> (less than 1% chance). An explicit uncertainty range (<math>\pm</math>) is a <i>likely</i> range. Estimates of confidence relating to WGII findings are: <i>very high</i> (95% or greater), <i>high</i> (67–95%), <i>medium</i> (33–67%), <i>low</i> (5–33%), and <i>very low</i> (5% or less). No confidence levels were assigned in WGIII.</p>	

The objective of the statement is to assist Governor Kulongoski's Advisory Group on Global Warming (GAGGW) by describing the state of scientific knowledge and uncertainty regarding climate change impacts in the Pacific Northwest. The GAGGW is charged with recommending strategies for reduction of greenhouse gas emission for the State of Oregon. [For information, visit: [http://www.energy.state.or.us/climate/Warming/Report/Appendix\\_D\(Draft\).htm](http://www.energy.state.or.us/climate/Warming/Report/Appendix_D(Draft).htm).]

water development, ground water is assumed to be available. The state does not limit new domestic well construction until a documented decline of the resources occurs. With the realization that the surface water in the region is fully appropriated, there is an anticipated increase in use of ground water. This is particularly an issue for most of the small cities in the Satellite Communities Growth Scenario and the rural area in the Rural Growth Scenario.

As discussed in the attached paper “Identifying Future Water Needs and Resources,” by Michael Mattick, Oregon Water Resources Department, except for the McKenzie River, water is not available in the region from surface water sources for new municipal uses. Reauthorization of the Willamette Basin Project Reservoirs (federal projects) may make storage releases a viable source in the future. New ground water sources are possible, though problematic, due to yield or hydraulic connection issues. Intensive rural development with intensive well construction will result in water distribution problems. Transferring existing water rights is an option in most situations, but a transfer process requires a review for injury and these reviews can be difficult to get approved.

Through the Region 2050 process, the local governments in the region have the opportunity to recognize the need for and coordinate water management planning at the regional level. This evaluation is intended to assess the relative impacts on water system capacity and cost of the three alternative growth scenarios; not to determine how water will best be provided in the Preferred Growth Scenario. It is anticipated that a more in-depth analysis will be recommended in the Regional Growth Management Strategy to determine the most efficient and sustainable way to provide water services in the region under the Preferred Growth Scenario.

## **Scenario Comparison**

### **All Scenarios**

- ✚ Fish bearing streams and tributaries are more restrictive in terms of municipal water availability. If hydraulically connected, DEQ may comment that there are concerns.
- ✚ By 2050, water quality and quantity will most likely be regulated in an integrated watershed approach by local, state and federal agencies. This is especially significant in Compact and Satellite Scenarios where municipalities are subject to NEPA requirements and thus eligible for federal loan monies.
- ✚ Completing the municipal reservation and agriculture reservation study. (Bill Fuji will send an e-mail on this).
- ✚ Good to know if cooperative system solution is best environmentally but funding or expense is an issue because this is an opportunity to find state funding to make it happen (Governor’s Economic Revitalization Team Coordinator).

## Compact Growth Scenario

- ✦ It is important to consider how to serve urban reserves.
- ✦ EWEB and SUB can share water resources. There is statutory authority for it; the issue is supply, not rights and there is sufficient supply.
- ✦ Water availability is highest in this scenario.

## Satellite Growth Scenario

- ✦ New ground water rights may be needed and may be prohibited.
- ✦ Cottage Grove has ample rights.
- ✦ Creswell's water rights may not be adequate to serve this scenario. Creswell has been denied surface water rights.
- ✦ Treatment costs may be prohibitive due to arsenic.
- ✦ Veneta is approaching capacity of wells.
- ✦ New wells need to demonstrate no injury.
- ✦ If municipal wells must compete with exempt uses with senior rights (protected) the question is can they go deeper and stay in aquifer?
- ✦ Need to look at well head protection areas and locate wells strategically to not impact ground water.
- ✦ In and around Junction City, Coburg, and other farming communities, land use permits are required to provide water: potential conflicts with agriculture community.
- ✦ Lowell water rights are to the river, although intake is in the Reservoir.
- ✦ Groundwater quality issues: arsenic is a potential limiting factor in and around Cottage Grove, Lowell, Lorane, and in general along the east side of the valley south of Eugene where there are western Cascades volcanics. Nitrates are an issue in the northern part of region in and around Coburg and Junction City. High saline potential on the western side of the region around Veneta - associated with marine sedimentary rock.
- ✦ This scenario presents an opportunity to look at different water delivery systems – trading, sharing, coordinating. Hydraulics is an issue. Goshen and Pleasant Hill – if SUB and EWEB can serve these areas, i.e., if it is cost effective to do so, this could work.

- ✚ In next 50 years, reservoirs may become legal source of drinking water whereas now they are not allowed for drinking water. Almost all current use of storage is for agriculture. The Certificate is held by Bureau of Reclamation (BOR) and an adjustment to the certificate is needed. A federal policy shift is needed related to allocation and cost. This requires an Act of Congress.

If an alternatives analysis demonstrates the Preferred Scenario using stored water is the most cost-effective and environmentally friendly, it would provide the data base and clout to make changes in policy. This study of alternatives would be an action in the Regional Growth Management Strategy.

## Rural Growth Scenario

- ✚ If Municipal wells must compete with exempt uses with senior rights (protected) the question is can they go deeper and stay in aquifer?
- ✚ In and around Junction City, Coburg, and other farming communities, land use permits are required to provide water: potential conflicts with agriculture community.
- ✚ Groundwater quality issues: Arsenic is a potential limiting factor in and around Cottage Grove, Lowell, Lorane, and in general along the east side of the valley south of Eugene where there are western Cascades volcanics. Nitrates are an issue in the northern part of region in and around Coburg and Junction City. High saline potential on the western side of the region around Veneta - associated with marine sedimentary rock.
- ✚ Driller needs to follow well construction regulations. Distance to septic or other drain field could be limiting at these densities. One acre lot development is very complex and more difficult as time goes on.
- ✚ Large lot subdivision with community system is complex. Need entity to be responsible for system. Difficulty with operations and maintenance. Community systems are complex and costly to maintain, especially if treatment is needed.
- ✚ Individual well owner options are limited and are expensive to construct, operate and maintain. There are costs to test and it is a “buyer beware” situation because if seller has not tested it and water is not drinkable, the seller is not held accountable. Maintenance of domestic wells in rural areas is a cost, especially if treatment is needed. Further complicated by increased risk of contamination with increased densities.

In the matrix below, each scenario is rated high, medium, or low on each criterion. For example, if a scenario strongly meets a criterion, it will receive a rating of “high” for that criterion; if it does not meet a criterion, the scenario will receive a rating of “low” for that criterion. This first threshold analysis is supplemented, where applicable, by a qualitative and/or geographic-specific analysis.

## Water Assessment

	Compact	Satellite	Rural	Issues
<b>Water Supply Availability</b> <ul style="list-style-type: none"> <li>✚ Reliability</li> <li>✚ Predictability of supply</li> <li>✚ Ease of service</li> </ul>	<b>H</b>	<b>H</b> except Creswell, Veneta, Coburg; <b>L</b> ( <b>H</b> if rely on EWEB)	<b>L</b>	EWEB, and Cottage Grove have ample water rights and EWEB and SUB can share supply. In Satellite, water supply limits growth in Veneta, Creswell, and Coburg; but if EWEB provides the service, these cities would rate H in Satellite. In Rural, it is hard to site both wells and septic on one acre lots; availability highly unpredictable due to cumulative impacts.
<b>Capital Cost</b> <ul style="list-style-type: none"> <li>✚ Cost predictability</li> </ul>	<b>H</b>	<b>M</b>	<b>L</b>	Costs are relatively easy to project in cities; much harder in rural area due to so many unknown costs.
<b>Cost-Effective</b> <ul style="list-style-type: none"> <li>✚ Low capital costs</li> </ul>	<b>M</b>	<b>H</b>	<b>L</b>	The capital costs of the Satellite would be the lowest and the Rural the highest (see Table 1). The capital costs of the Compact would be higher than the Satellite due to the expense of extending lines to Alvadore, Goshen and Pleasant Hill.
<b>Efficient Service Delivery</b> <ul style="list-style-type: none"> <li>✚ Low operations and maintenance costs</li> </ul>	<b>H</b>	<b>H</b>	<b>L</b>	Operations and maintenance costs would be highest in the Rural Scenario due to the lack of centralized, general administration, operations, and maintenance (testing, power costs for pumping, treatment, etc.)
<b>Protect Public Health</b>	<b>H</b>	<b>H</b>	<b>L</b>	In Compact and Satellite, municipal systems are regulated and monitored under state and federal law; and qualified staff manage water treatment. Monitoring and testing are individual options for on-site domestic systems in Rural. Many areas have water with heavy metals and nitrate problems which could lead to a high social cost for a private well approach to water service.
<b>Maintain System Reliability</b>	<b>H</b>	<b>H</b>	<b>L</b>	Professional staff in Compact and Satellite are able to project needs and maintain systems. Maintaining individual systems less reliable because testing done at individual level and treatment options are more limited.

# **Identifying Future Water Needs and Resources**

By Michael Mattick, Oregon Water Resources Department

January 26, 2004

## **Summary**

Except for the McKenzie River, water is not available from surface water sources for new municipal uses. Reauthorization of the Willamette Basin Project Reservoirs may make storage releases a viable source in the future. New ground water sources are possible though problematic due to yield or hydraulic connection issues. Intensive rural development with intensive well construction will result in water distribution problems. Transferring existing water rights is an option in most situations.

## **Oregon Water Law**

### **Need for a Water Right, permits and certificates**

Oregon Revised Statutes (ORS) 537.110 and 537.130, declares that: all water within the state from all sources of water supply belongs to the public; with various exceptions, any person intending to acquire the right to the beneficial use of any or the surface water of the state shall, before beginning construction, or performing any work, or appropriation, make an application to the Water Resource Department for a permit. ORS 537.535 contains similar provisions related to ground water.

Water use permits can only be issued for a five year period. Within that time, the permit holder is to develop the use system and make the permitted use. One more year is allowed for the permittee to hire a Certified Water Right Examiner (a special class of engineer or surveyor) who writes a report about the water use and any permit conditions and maps the system and use. This information is used to develop and issue a Water Right Certificate. The Certificate defines the right for all time and is the end of the water right application process.

If the use has not been developed to the full intended extent within the five year period, an extension of time may be requested. When evaluating the request, the Department considers whether or not the permittee has shown due diligence in development of the water right, and whether the right is likely to be necessary considering other rights the applicant may hold. The Department may grant an extension for whatever period is reasonable to fully develop the right. For a municipality, this may be 20 years or more. However, these long term extensions typically are conditioned to require periodic reporting of ongoing need for and development of the right.

### **New Water Rights**

The filing of a water use permit application establishes the tentative priority date for the water right if a permit is issued. The priority date is important because, during times of shortage, the oldest rights get to use water the longest, new rights are regulated off in

favor of older rights, regardless of what the use is. This is known as the Prior Appropriation Doctrine.

The Department can only accept applications for uses which are Classified in the Basin Program. A Basin Program is a set of administrative rules adopted by the Water Resources Commission, identifying which new uses of water will be allowed from the various sources in a particular river basin. The Willamette Basin Program is contained in Oregon Administrative Rule (OAR) Chapter 690, Division 502, and can be viewed at [http://oregon.gov/OWRD/files/Publications/Notices/new\\_oars/Div\\_502-Willamette\\_Basin.pdf](http://oregon.gov/OWRD/files/Publications/Notices/new_oars/Div_502-Willamette_Basin.pdf)

## **Surface Water**

The McKenzie River is the only stream in the Southern Willamette Valley classified for new municipal use on a year round basis. All other surface waters of the Willamette Basin from Albany continuing upstream are restrictively classified to prohibit new municipal use permits between July 1 and August 31 of each year. The farther up the basin one travels, the more restrictive the municipal restriction becomes. Essentially, except for the McKenzie, the natural flow of surface water is closed to new municipal permits during the summer months.

## **Stored Water**

If an entity has the ability to store “excess” water during the winter and spring, the Department would very likely issue a permit allowing the storage and another allowing the use of that stored water.

The Army Corps of Engineers stores significant quantities of water in the various Willamette Basin storage projects (Cottage Grove, Dorena Lake, Lookout Point, and Fern Ridge Reservoirs). However, due to the authorizing federal legislation and the language used on the reservoir certificates, that water is currently unavailable for purchase by municipalities. A joint state federal effort to look at reauthorizing the projects was tabled. That effort may be resurfacing. For entities with the ability to reach a diversion point below these projects, storage releases may be an option in the future.

## **Ground water**

### **The Resource**

Very generally speaking, there are two types of aquifers in the Southern Willamette Valley, alluvial and bedrock.

The alluvial aquifer is made up of boulders, gravel, sand, various layers of clay and silts, which have washed down from the Coast Range, Cascade Mountains and foot hills. As this material moved down gradient, it filled in valleys, creating valley floors. Generally speaking, the ground water found in these areas is considered unconfined, meaning the water is at atmospheric pressure, or put another way, when water is encountered at some depth, it does not rise up in the hole but stays at that depth. The

resource is often abundant. However, wells constructed in these areas may be significantly connected to nearby surface water streams.

The bedrock aquifers flank the valley floors. Generally speaking, the geology to the East and South of the Willamette Valley is strongly influenced by volcanic activity from the Cascade Range. The rock may be basalt from lava flows or it may be compressed ash deposits or a mixture of volcanic materials. The bedrock on the West of the valley is composed of ancient marine sediments that have been up lifted over time. This is ancient seabed, sandstone and siltstone, mudstone. Generally speaking, in bedrock of both origins, volcanic and marine, water does not readily move *through* the rock. Rather it moves through fractures or cracks and seams in the rock formation. This is why wells in close proximity may have very different yields. One well may encounter large extensive fractures while another may encounter none. Often, the water found in these wells rises to a higher level than where it was first encountered.

The level at which water stabilizes is called the Static Water Level. When the water rises to shallower depth than where it was encountered, the aquifer is generally considered to be confined, meaning an impermeable material overlies the aquifer holding it under pressure. When the well pierces the material, the water rises in the hole. Wells in these formations are less likely to be strongly hydraulically connected to surface water but they usually yield less water than those in alluvium deposits. Also, wells in volcanic material have some potential to yield water with unsafe arsenic levels. The department recommends all wells drilled in volcanic formations, used for domestic consumption, be tested annually for arsenic. Arsenic can be removed through reverse osmosis and other means.

The state tries to manage ground water in conjunction with surface water. If the use of a well will substantially influence water availability in a stream, the proposed use is evaluated under the same standards applied to a proposed use from that stream. Every new application to use ground water is evaluated to consider the effect it may have on surface water sources. A shallow well tapping unconfined water is considered to have potential for substantial interference with every stream within a quarter mile of the well.

### **Domestic Wells**

State law exempts certain uses of ground water from the water use permitting requirements (ORS 537.545). These uses include: livestock watering; irrigation of up to one half acre of non-commercial lawn or garden; industrial and commercial use of up to 5,000 gallons per day; and domestic use of up to 15,000 gallons per day.

15,000 gallons is a large amount for a domestic system. The statute is intended to exempt individuals and "small" community systems from the need for a permit from the state. The exemption could allow 30 homes to each use 500 gallons per day or 150 homes to each use 100 gallons per day. The exception applies to an individual well or group of wells plumbed into one system. The half acre lawn and garden exception likewise applies to the system, so 10 homes, each with  $\frac{1}{4}$  acre lawn, would require an irrigation permit for the 2.5 acres of irrigation.

Though these uses are exempt from permitting requirements, they are not exempt from regulation if the ground water resource declines and there is not enough for all who desire to use it. If wells are found to interfere with each other and a complainant has fully penetrated the aquifer, the Department determines priority dates from whatever information is available and regulates water use based on those dates.

Intensive development of rural properties, relying on ground water for domestic water supplies will result in increased interference complaints and distribution activity. Some areas do yield low quantities of ground water where homeowners haul water to storage tanks during the driest summer months.

### **Transfer of Water Rights**

A water right identifies a particular point of diversion or appropriation, character of use, place of use, an allowable rate of diversion and for irrigation rights, often a maximum quantity that may be diverted during a year or season. The character, point of diversion, and place of use may be changed through a Transfer process. The transfer application must demonstrate that the right has been used within the last five years and that the same source will be utilized. The department evaluates the application to ensure it will not injure any other existing right, regardless of priority dates. Generally speaking, water rights may be moved downstream to the same or other uses more readily than upstream.

### **Additional Information**

The WRD Web Page address is <http://oregon.gov/OWRD> and has additional information and resources. The Link: <http://oregon.gov/OWRD/PUBS/aquabook.shtml> is another good overview of Oregon Water Law.

### **Well Logs**

Well logs on file can be viewed from the WRD web site. On the lower left, under Access Data, click "find a well log" instructions and answers to frequently asked questions can be accessed at the bottom of the screen.

### **Water Right Locations**

In the center of the Web page is a link Create Water Right Maps. Selecting Interactive Mapping will allow you to generate water right maps of particular areas using the Township, Range and Section information. Water right locations are bright green and points of diversion are purple triangle. This data are approximate.



**APPENDIX A  
WATER SURVEY**





## Water Supply Questionnaire

*Dear Water Utility Staff:*

*Please complete the following questionnaire and return your response via e-mail to [cheinkel@lane.cog.or.us](mailto:cheinkel@lane.cog.or.us) or hard copy to Carol Heinkel, LCOG, 99 East Broadway, Suite 400, Eugene, Oregon 97401 **by August 10, 2004.***

1. What is the current service area population of your water system?
2. What is the projected service area population (current capacity in terms of population)?
3. Please estimate the cost of providing water services to the additional population (including all customer classes) for each of the growth scenarios (see attached tables). Assume the mix of customer base and current average consumption levels remain the same as in the year 2000 over the next 50 years. Please include overall systems costs as well as an average cost per customer.\* Please break out and include costs for large transmission lines and estimate the cost at \$250 per lineal foot. Estimate the distance by scaling it on the GIS maps of the scenarios.
4. Assuming that the average per customer consumption in all customer classes remains the same as in 2000 and that costs are spread evenly among all customers (new and existing), at what customer level (service area population) will you be required to make a major capital investment such as new well or new filtration facilities? Please include these costs into the estimates in question #3.
5. Will serving population growth in any of the scenarios require applying for additional surface water rights? Will it require applying for ground water rights?
6. What issues do you anticipate in providing water services under each of the growth scenarios?

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\*Average cost per customer is not a rate. It is a fraction or "per unit cost" that will be used as a common measure to compare the scenarios.

**APPENDIX B**  
**Expert Panel on Water Issues in the**  
**Southern Willamette Valley Region**





## **Expert Panel on Water Issues in the Southern Willamette Valley Region**

- + Erik Andersson, Governor's Economic Revitalization Team
- + Chuck Arrera, Springfield Utility Board
- + Deb Brewer, Brad Taylor, Tom Buckhouse, EWEB
- + Amanda Ferguson, Cottage Grove
- + Neil Friedman, Westfir
- + Bill Fujii, Mike Mattick, Doug Woodcock, Oregon Water Resources Department
- + Tim Hanley, Rainbow Water District
- + Rick Hayes, Army Corps of Engineers
- + Mike Leighton, Junction City
- + Jim Bruvold, Veneta
- + David Livesay, Jeff Barry, Groundwater Solutions, Inc.
- + Bill Mason, Consulting Hydrologist, Oregon Department of Environmental Quality
- + Eleanor Mulder, Janet Calvert, League of Women Voters
- + Stephanie Schulz, Lane County Land Management
- + Mark Darienzo, Marguerite Nabeta, Oregon Department of Land Conservation and Development
- + Scott Olsen, Branch Engineering, Coburg
- + Ric Ingham, Veneta
- + Jerry Elliott, Elliott West Engineers, Veneta
- + Carol Heinkel, Susan Payne, Denise Walters, LCOG.



## Expert Panel on Water Issues in the Southern Willamette Valley Region

Thursday, March 3, 2005 3:00 – 5:00 p.m.  
LCOG 4<sup>th</sup> Floor Conference Room  
99 East Broadway, Suite 400, Eugene  
(Wells Fargo Bank Building on corner of Oak and Broadway)

Contact: Carol Heinkel, 682-4107, [cheinkel@lane.cog.or.us](mailto:cheinkel@lane.cog.or.us)

### AGENDA

- |   |      |
|---|------|
| Come early and review Alternative Growth Scenarios<br>GIS wall maps (Attachments) Refreshments  | 2:30 |
| 1. Welcome and Introductions<br>Carol Heinkel, LCOG, Project Manager  | 3:00 |
| 2. Water Availability: Surface Water and Groundwater<br><u>Discuss and identify water supply limitations under the three Alternative Regional Growth Scenarios:</u> <ul style="list-style-type: none"><li>▪ Compact Urban Growth Scenario</li><li>▪ Satellite Communities Growth Scenario</li><li>▪ Rural Growth Scenario</li></ul> | 3:05 |
| 3. Options to Serve Targeted Growth Areas with Limited Water Supply<br><u>Identify and Discuss Options</u> <ul style="list-style-type: none"><li>▪ Compact Urban Growth Scenario</li><li>▪ Satellite Communities Growth Scenario</li><li>▪ Rural Growth Scenario</li></ul>  | 3:40 |

Note: Meeting continued to March 9, 2005

4. Cost Estimation Methodology 4:30

Brainstorm ways to estimate costs of new water systems needed to serve targeted growth areas

- Compact Urban Growth Scenario
- Satellite Communities Growth Scenario
- Rural Growth Scenario

5. Next Steps and Adjourn 4:55

**ATTACHMENTS:**

- ✚ Region 2050 Alternative Growth Scenarios Evaluation: Water Supply and Facilities Approach, Assumptions, and Issues, Draft February 10, 2005
- ✚ Region 2050 Regional Goals and Objectives
- ✚ Alternative Regional Growth Scenarios Concepts and Evaluation, Spring 2004
- ✚ Graphic Maps of Alternative Growth Scenarios: <http://www.region2050.org/altgrowthscenarios.html>

**Regional Technical Advisory Committee**

**Coburg**

Ashley DeForest

**Cottage Grove**

Amanda Ferguson  
Howard Schesser

**Creswell**

Mark Shrives  
Megan Banks

**DEQ**

Mike Wolf  
Bill Mason

**EPUD**

Doug Barab

**Eugene**

Allen Lowe  
Kurt Yeiter  
Peggy Keppler

**EWEB**

Deb Brewer  
Brad Taylor  
Rich Jeffryes

**Junction City**

Sandra Belson  
Michael Leighton

**Lane County**

Stephanie Schulz  
Kent Howe  
George Ehlers

**League of Women Voters**

Janet Calvert  
Eleanor Mulder

**Lowell**

Chuck Spies

**Oakridge**

Kevin Urban  
Gordon Zimmerman

**ODOT**

Terri Harding

**Springfield**

Greg Mott  
George Walker  
Peter Ruffier  
Susan Smith

**Springfield Utility Board**

Mary Ann Rhodes  
Chuck Arrera  
Ray Meduna

**Veneta**

Sandra Belson  
Margaret Boutell  
Jim Bruvold

**Westfir**

Neil Friedman

**Water Resources Department**

Michael Mattick

**Lane Transit District**

Stefano Viggiano

**Department of Land Conservation and Development**

Marguerite Nabeta



## **Expert Panel on Water Issues in the Southern Willamette Valley Region Meeting Notes Thursday, March 3, 2005**

### **Participants:**

Erik Andersson, Governor's Economic Revitalization Team; Chuck Arrera, Springfield Utility Board; Deb Brewer, Brad Taylor, Tom Buckhouse, EWEB; Amanda Ferguson, cottage Grove; Neil Friedman, Westfir; Bill Fujii, Mike Mattick, Doug Woodcock, Oregon Water Resources Department; Tim Hanley, Rainbow Water District; Rick Hayes, Army Corps of Engineers; Mike Leighton, Junction City; Jim Bruvold, Veneta; David Livesay, Jeff Barry, Groundwater Solutions, Inc.; Bill Mason, Consulting Hydrologist, Oregon Department of Environmental Quality; Eleanor Mulder, League of Women Voters; Stephanie Schulz, Lane County Land Management; Mark Darienzo, Marguerite Nabeta, Oregon Department of Land Conservation and Development; Scott Olsen, Branch Engineering, Coburg; Carol Heinkel, Susan Payne, Denise Walters, LCOG.

### **Presentations by Oregon Water Resources Department (OWRD) Staff:**

#### **1. Surface Water Application Process Mike Mattick, Water Master Region 2**

Applications for surface water rights must pass through two (2) core screens to continue through the review process. The first screen is to determine if the use proposed is a classified use in the Water Basin Program. In the case of jurisdictions participating in Region 2050 this would be the Willamette Basin Program (Oregon Administrative Rule 690-502). The second screen is to determine that there is enough water availability/supply using an 80% exceedence basis (for example, enough water for 8 out of 10 years considered on a month by month basis).

Most water use in the Willamette Basin is restricted from September 1<sup>st</sup> through June 30<sup>th</sup> based on water availability. The McKenzie River is an anomaly, however, and water use is permitted year round. Water availability tables and an interactive water rights map can be found on the Oregon Water Resources Department website at <http://www.wrd.state.or.us/OWRD/WR/index.shtml>.

Contracts for water stored by the Willamette River Basin Project are issued by the Bureau of Reclamation for irrigation. The US Army Corps of Engineers (Corps) has reviewed a process for issuing contracts for surplus water but the state issued storage certificates only specify irrigation for a purpose. In comparison to live stream flow or ground water permits, contracts for stored water are expensive and primarily for irrigation. It would take an act of Congress to allow this stored water available for municipal use (see Willamette Basin Reservoir Study).

## **2. Ground Water Application Process- Doug Woodcock, Manager Groundwater Hydrology Section**

The review of groundwater use is based on the public interest presumption: *The Department shall presume that a proposed ground water use will ensure the preservation of the public welfare, safety and health (OAR 690-310-130)*. The presumption is met if:

- The proposed use is allowed in the applicable basin plan;
- Water is available;
- The proposed use will not injure other water rights;
- The proposed use complies with the rules of the Commission.

A key component in considering injury to other water rights is a determination of hydraulic connection to surface water and potential for substantial interference. If the groundwater source is determined to be hydraulically connected to a surface water source, the potential for substantial interference is assumed if:

- a) Less than  $\frac{1}{4}$  mile from surface water; or
- b) Rate greater than five (5) cubic feet per second (cfs), less than one (1) mile; or
- c) Rate greater than 1% of:
  - A senior instream water right;
  - The 80% estimated or discharged if less than one (1) mile; or
- d) Stream depletion is greater than 25% of the pumping rate after 30 days of pumping, if less than one mile.

If a proposal is found to result in potential for substantial interference and surface water is not available, an applicant has the following options:

- Move the well location;
- Reduce the rate of appropriation;
- Mitigate for surface water impacts.

## **3. Willamette Basin Reservoir Study, Water Management Plans, Water Rights, Permits, and Certificates Overview - Bill Fujii, Basin Planning**

Willamette Basin Reservoir Study:

There are difficult issues related to municipal access to the water stored in the Willamette Basin Reservoirs operated by the Army Corps of Engineers. The Willamette Basin Reservoir Study is a cooperative cost-shared study with the U.S. Army Corps of Engineers. Funding for the study has been provided by the federal government, the State of Oregon and more than 60 cities, special districts, organizations and commercial and industrial firms. The major challenge of the Willamette Basin Reservoir Study will be to identify ways to balance competing demands and help meet future water needs in the valley while retaining those aspects of current operations that people value today and in the future. Work on the study has been delayed to allow consultation with federal fish management agencies regarding the impacts of reservoir operations on fish, wildlife and plant species listed as threatened or endangered under the Endangered Species Act (ESA). See the WRD website or details on the study: [http://www1.wrd.state.or.us/pdfs/Res\\_Study\\_Update\\_2001.pdf](http://www1.wrd.state.or.us/pdfs/Res_Study_Update_2001.pdf) (PDF 64 KB). As of 2005, WRD & the Corps have agreed to review some of the base data due to the length of time the study has been paused.

#### Water Management:

Mr. Fujii explained the difference between a water use permit and a water right certificate. Water permits are just one step in obtaining a water right certificate. After an applicant receives a water permit s/he must then construct a water system, begin water use, and provide documentation of the water use showing they have met all conditions applied to the permit. Once this proof has been supplied to OWRD's satisfaction, a water right *certificate* can be issued. A water right certificate will continue to be valid as long as the water is used according to the provisions of the water right at least once every five years (with a few exceptions). However, in the event of a change in water availability, senior water right certificate holders will have a priority access to the resource.

Ms. Heinkel asked if population projections are a component of the application process for obtaining water rights. Mr. Fujii said that they are now but in the past OWRD has just assumed a jurisdiction would know how much water they wanted, but pointed out that many municipal water rights are very large. Under ORS 540.510 municipalities are allowed to share water as long as the use is for municipal purposes and other water rights are not impaired. He directed the group to look at actual water use and compare to the water right of different jurisdictions at [http://www.wrd.state.or.us/OWRD/WR/water\\_use\\_report.shtml](http://www.wrd.state.or.us/OWRD/WR/water_use_report.shtml).

OWRD does not expect municipalities to develop water permits in a short time period. Permit extensions are allowed for these larger under utilized municipal permits. However, jurisdictions must show due diligence in their pursuit of water right certificate. A condition of the permit extension is a Water Management and Conservation Plan. Mr. Fujii brought guidebooks prepared by the League of Oregon Cities to help jurisdictions develop water management conservation plans. The 20 Year Water Supply Plan portion of the Water Management plan

must be consistent with Region 2050 analysis or the jurisdiction will need to provide rationale as to why they have chosen to center the plan on an alternative analysis. More details are available on the Municipal Conservation portion of the WRD web site: [http://www.wrd.state.or.us/OWRD/mgmt\\_muni\\_wmcp.shtml](http://www.wrd.state.or.us/OWRD/mgmt_muni_wmcp.shtml) . One item that has been recently added is an updated [Model Water Curtailment Measures for Municipal and Quasi-Municipal Water Utilities](#) (PDF 144 KB) with a catastrophic / human consumption only ordinance added.

Ms. Brewer asked if there is any regulation of domestic wells. Mr. Mattick responded that domestic wells are exempt from permits for up to 15,000 gallons of water per day. However, domestic wells which fit in this category are regulated in terms of construction of the well, proximity to septic tank and drainfield, etc. Mr. Mason asked what tools OWRD had available in the event they found a domestic well which was adversely impacting another water user. Mr. Mattick said the senior water user would have priority over junior users; and the junior user would be limited in their use or told to stop altogether.

#### **4. Water Supply Limitations to the Alternative Growth Scenarios-all**

Ms. Heinkel reminded the group that the Region 2050 process is informed by community visions and technical evaluations which when combined will result in a regional growth management strategy adopted by each of the participating jurisdictions and LCDC. The purpose of the water panel meeting is to define a methodology with which to develop options for water service provision to areas with limited water supply. Ms. Heinkel asked that the discussion begin with the group identifying water supply limitations in each of the three alternative growth scenarios.

Mr. Arrera of the Springfield Utility Board (SUB) said in all three scenarios jurisdictions will have to extend their water to become water certificates (as Mr. Fujii clarified) including a Water Management Conservation Plan, which would require an analysis of demand management. SUB's " Water Conservation and Management Plan" has been approved by the WRD.

Mr. Fujii said that there is an opportunity to acquire water rights as agricultural lands are transitioned to residential lands. When the agricultural lands subdivide, the property owners may also own irrigation (water) rights which could be transferred to the jurisdiction. Many of these water rights are senior water rights, so if they are transferred to a jurisdiction, the jurisdiction would in addition to having additional water rights, be a senior water right holder. Water rights transfers require a separate process which varies in complexity depending on point of use and consideration of impacts to other water rights in the vicinity. For example, it is more difficult to move a point of diversion upstream than downstream. Mr. Fujii suggested perhaps the more appropriate question to frame analysis of the scenarios would be is there adequate water supply?

Mr. Mason asked if there were enough water rights in the Region 2050 area to cover water demand. Mr. Taylor replied yes, but this is dependent on timing. For the Compact Growth Scenario there is the statutory authority for sharing water resources and adequate supply is available.

Mr. Leighton spoke of Junction City's need for one (1) to two (2) more wells, additional water storage, and new points of diversion to serve future development of 200 acres recently annexed into the city. Mr. Mattick responded adding more municipal wells may require additional water rights; and even changing the points of water diversion might require additional administrative transfer of permit amendment process depending on the distance from the original point of diversion and potential adverse impact to other water rights holders in the vicinity.

Ms. Nabeta commented one constraint in the Satellite Growth Scenario might be the acquisition of additional groundwater rights. Some jurisdictions might be underestimating the potential for denial of groundwater rights because the last time they dealt with this issue, the process to obtain water rights was very different. Mr. Mattick commented he believes that in the Satellite Growth Scenario, Cottage Grove has adequate water rights; Creswell might not have the rights they think they do based on their limited ability for a transfer of surface water rights; and Veneta, entirely dependent on groundwater, cannot transfer or obtain new rights in the strongly connected to the Fern Ridge Reservoir aquifer. Transferring agricultural rights may be a partial solution. Veneta is nearing its existing capacity and will likely require additional wells.

Mr. Fujii warned that senior water right holders could present an obstacle to municipal water rights. Mr. Mason identified water quality issues related to well head protection areas in the Satellite Growth Scenario. Mr. Mason also mentioned the presence of arsenic could be problematic for communities on the south and east areas of the Willamette Valley; and the presence of nitrates could be problematic in the northern part of the region. Ms. Nabeta said this could be an opportunity to look at different water delivery systems including resource sharing.

Mr. Barry of Groundwater Solutions stated land use approval could be an issue in both the Satellite Growth and Rural Growth scenarios. Where comprehensive plan map changes are involved, the process to obtain water rights could be delayed up to 10 years. Mr. Fujii reinforced this issue by reminding the group that OWRD has to make findings of consistency with comprehensive plans for each application.

Mr. Woodcock commented that water quality could be as much of an obstacle as water supply in the Rural Growth Scenario and potentially the Satellite Growth Scenario. In the Rural Growth Scenario, rural communities (such as Elmira and Goshen) are assumed to develop with one (1) acre lots where marginal lands and other rural residential lands are assumed to develop with two (2) acre lots. It will be difficult to have a number of one (1) acre lots adjacent to one another and still be able to meet the requirement to locate wells at least 100' away for septic tanks and

drain fields. Mr. Mason commented he had seen some cases where people located their well next to their property line to prevent the adjacent land from developing.

Ms. Ferguson reminded the group to factor in the cost of system maintenance into any budget estimates. Ms. Payne also reminded the group that there are costs associated with domestic wells; they are not free water service. Mr. Mason told the group that water quality in the context of domestic wells is the responsibility of the owner. DEQ can only provide assistance regarding water systems loosely defined as three or more lines. Additionally, the cheapest bid to develop a domestic well does not always result in the best well. Cheap bids often drill the well to a fairly shallow depth which would have poorer water quality than deep wells.

Mr. Barry identified TMDL and ESA as issue for all three alternative growth scenarios. He predicted in the future the nexus between water quantity and water quality will be much stronger. Mr. Fujii said federal, state, and local interface could be a concern in the Compact and Satellite Growth scenarios. Financing for water infrastructure will likely come at least in part from federal sources which will require a NEPA analysis and implementation actions and further increase costs.

Mr. Hayes of US ACE stated the cost of using Bureau of Reclamation (BOR) stored water is currently cost prohibitive due to federal regulations now in place. Currently, BOR stored water is intended for agricultural use. It would require an Act of Congress to make this water available for municipal use and to make it a feasible option by changing the fee scale. Ms. Nabeta asked if the 11 local governments and state agencies agree on a strategy will that strengthen their position in obtaining such changes in Congress. Mr. Hayes said yes, absolutely, and that an alternative analysis of water supply would have to be done. Ms. Heinkel asked if the process would proceed in the way that there is agreement on the Strategy, the Strategy lists as an action a study of the most cost-effective, environmentally-friendly way to serve growth in the Preferred Growth Scenario, the study is funded and the alternatives analysis shows that the solution or part of the solution is for the municipalities to access stored water for drinking water, then the 11 local governments would approach Congress for a change in the regulations to make that occur? Mr. Fujii responded yes, that that would result in two important pieces: a technical finding and a unified political voice and clout to take to Washington, D.C. Mr. Hayes said that change to improve access to stored water could come from the ACE, but that coming from the jurisdictions with an alternatives analysis would make a much stronger case.

Mr. Andersson from the Governor's Office told the group in situations where an approach to water supply makes environmental sense but does not make economic sense to let him know, so the state can look into economic incentives to make some options more feasible.

Ms. Brewer mentioned the numbers for Lowell in the water survey are not correct and she will correct the numbers and send them to Ms. Heinkel.

Mr. Taylor asked about the inclusion of municipal reserves that would be included in the Basin Management Plans. This had been considered in the early 1990's but was not acted on. OECD filed a reservation for municipal uses and the Department of Agriculture for agricultural purposes. Both reservations are currently scheduled to be acted on once the Willamette Basin Reservoir Study is completed. Mr. Fujii can discuss this more at the next meeting.

## Facilitation Notes

*What water supply issues are presented in the three scenarios?*

### **Compact Growth Scenario:**

1. Permits need to be extended- not certificates – permits  
Need to be consistent with water management plans. (SUB's Water Conservation and Management Plan has been approved by the WRD)
2. Irrigation rights – Municipality would need to go through transfer/ acquisition process. Will this change adversely affect another water right?
3. Important to consider how to serve urban reserves.
4. EWEB and SUB can share water resources. There is statutory authority for it; the issue is supply, not rights and there is sufficient supply.

### **Satellite Growth Scenario:**

1. New ground water rights may be needed and may be prohibited.  
Consider injury issue. – Can be limiting factor.
2. Cottage Grove has ample rights.
3. Creswell's water rights may not be adequate to serve this scenario. Creswell has been denied surface water rights. Treatment costs may be prohibitive due to arsenic.
4. Veneta is approaching capacity of wells. New wells need to demonstrate no injury.
5. If municipal wells must compete with exempt uses with senior rights (protected) the question is can they go deeper and stay in aquifer?
6. Need to look at well head protection areas and locate wells

strategically to not impact ground water.

7. In and around Junction City, Coburg, and other farming communities, land use permits are required to provide water: potential conflicts with agriculture community.
8. Lowell water rights are to the river, although intake is in the lake. For this reason, Lowell has access to stored water that would not otherwise be feasible.
9. Groundwater quality issues: Arsenic is a potential limiting factor in and around Cottage Grove, Lowell, Lorane, and in general along the east side of the valley south of Eugene where there are western Cascades volcanics.

Nitrates are an issue in the northern part of region in and around Coburg and Junction City.

Potential high saline potential on the western side of the region around Veneta - associated with marine sedimentary rock.

10. This scenario presents an opportunity to look at different water delivery systems – trading, sharing, coordinating. Hydrolics is an issue. Goshen and Pleasant Hill – if SUB and EWEB can serve these areas, i.e., if it is cost effective to do so, this could work.
11. In next 50 years, reservoirs may become legal source of drinking water whereas now they are not allowed for drinking water. Almost all current use of storage is for agriculture. The Certificate is held by Bureau of Reclamation (BOR) and an adjustment to the certificate is needed. A federal policy shift is needed related to allocation and cost. This requires an Act of Congress. Alternatives analysis demonstrates the solution is the most cost-effective and environmentally friendly. This study of alternatives would be an action in the Regional Growth Management Study.

### **Rural Growth Scenario:**

1. If Municipal wells must compete with exempt uses with senior rights (protected) the question is can they go deeper and stay in aquifer?
2. In and around Junction City, Coburg, and other farming communities, land use permits are required to provide water: potential conflicts with agriculture community.
3. Groundwater quality issues: Arsenic is a potential limiting factor in and around Cottage Grove, Lowell, Lorane, and in general along the east side of the valley south of Eugene where there are western Cascades volcanics.

Nitrates are an issue in the northern part of region in and around Coburg and Junction City.

Potential high saline potential on the western side of the region around Veneta - associated with marine sedimentary rock.

4. Driller needs to follow well construction regulations. Distance to septic or other drain field could be limiting at these densities. One acre lot development is very complex and more difficult as time goes on.
5. Large lot subdivision with community system is complex. Need entity to be responsible for system. Difficulty with operations and maintenance. Community systems are complex and costly to maintain, especially if treatment is needed.
6. Individual well owner options are limited and are expensive to construct, operate and maintain. There are costs to test and it is a "buyer beware" situation because if seller has not tested it and water is not drinkable, the seller is not held accountable. Maintenance of domestic wells in rural areas is a cost, especially if treatment is needed. Further complicated by increased risk of contamination with increased densities.

### **All Scenarios:**

1. Fish bearing streams and tributaries are more restrictive in terms of municipal water availability. If hydrologically connected, DEQ may comment that there are concerns.
2. By 2050, water quality and quantity will most likely be regulated in an integrated watershed approach by local, state and federal agencies. This is especially significant in Compact and Satellite Scenarios where municipalities are subject to NEPA requirements and thus eligible for federal loan monies.
3. Completing the municipal reservation and agriculture reservation study. (Bill Fuji will send an e-mail on this).
4. Good to know if economics does not work but cooperative system solution does work environmentally to do cooperative system because this is an opportunity to find state funding to make it happen (Governor's Economic Revitalization Team Coordinator).

Notes taken by Denise Walters.



## **Expert Panel on Water Issues in the Southern Willamette Valley Region Meeting Notes**

**Wednesday, March 9, 2005**

### **Participants:**

Janet Calvert, League of Women Voters; Ric Ingham, Jerry Elliott, Veneta; Mike Mattick, Bill Fujii, Oregon Water Resources Department; Stephanie Schulz, Lane County Land Management; Deb Brewer, Brad Taylor, EWEB; Neil Friedman, Westfir; Tim Hanley, Rainbow Water District; Carol Heinkel, Denise Walters, LCOG.

### **Water Availability Issues**

The group continued discussion of different water related issues in each of the three (3) alternative growth scenarios. Ms. Brewer expressed her belief that the information presented by OWRD staff is critical for jurisdictions; and asked Mr. Mattick if there was any plan for more outreach to local jurisdictions. Mr. Mattick replied there was no plan at this time. Mr. Ingham mentioned the League of Oregon Cities has some very useful information regarding municipal water services. Mr. Mattick said more outreach could occur, but this would not be likely at least until May. Ms. Brewer said Region 2050 seems to be such a good venue for conveying this information, she would like to see it utilized to the fullest extent possible. Ms. Schulz stated even if the jurisdictions themselves are not in direct contact with OWRD, at the very least their consultants should be in contact with OWRD. Mr. Mattick commented he has found that in many instances even when there is direct communication between OWRD and jurisdictions, there is often a disconnect between OWRD's perspective on an issue and a jurisdiction's interpretation of an issue.

Ms. Schulz noted no agricultural irrigators are at the table and they represent a big concern as do ESA listed species given there is not enough water for the months of July and August to serve all the water right certificate holders. Mr. Fujii reminded the group decisions about water use are based on the doctrine of prior appropriation (priority date of water rights) which often does not seem fair or kind. Ms. Schulz asked the group to take care in stating the constraints of the water availability analysis.

Ms. Heinkel reported she spoke with Matt Rea of USACE specifically about Veneta and Creswell and asked if water availability was prohibitive in the Satellite Growth and Rural Growth Scenarios. Mr. Rea reiterated Mr. Hayes perspective that BOR stored water could become available with an Act of Congress; but also stated, water quality could be a concern with this option. Ms. Heinkel asked if Veneta would be able to draw from the Long Tom. Mr. Mattick responded not unless the City were able to obtain a water right from a water right holder further upstream; the City would most likely not be able to obtain a new water right certificate to the Long Tom. Mr. Fujii clarified that BOR stored water is specifically designated for irrigation which is defined as the irrigation of crops for a profit. So, for example, a municipality still could not pay to use the stored BOR water for irrigation of public parks.

Ms. Heinkel asked for clarification on the idea that the addition of municipal wells in Veneta is a viable option if the wells do not impact the Fern Ridge aquifer. Mr. Mattick responded Veneta has a bit of a unique situation since there are so many domestic wells drawing from the aquifer that the need to protect senior water rights holders might make the option unreasonable. Mr. Ingham asked if there is a benefit to homeowners (domestic well users) if the City were to acquire the domestic wells from the owners both inside and outside of the City limits; and similarly if there is a benefit to the City to acquire domestic wells from owners both inside and outside the City limits. Mr. Mattick and Mr. Fujii pointed out domestic wells are exempt uses from water rights and the City would not be acquiring any water rights from that process. However, Mr. Fujii added if any of those owners are agricultural users, the City might be able to obtain that water right. Mr. Ingham commented there are very few agricultural producers in or near Veneta unlike Junction City.

Ms. Brewer reiterated her concern that more communication between OWRD and jurisdictions be facilitated and asked if it is a possibility to have OWRD outreach. Ms. Heinkel and Mr. Mattick said yes there will be more opportunities for information to be conveyed from OWRD to jurisdictions.

Mr. Ingham stated Veneta is struggling, as a small city, to find the financial resources to implement the steps which need to be taken. Sewer fees just recently increased and it is doubtful the City has the political will to support an increase in water fees. Ms. Brewer commented she sees Region 2050 as a way to help with financial resources particularly through increased competitiveness and eligibility for federal grants. Mr. Fujii noted Region 2050 definitely provides a more cohesive story with which to approach funders.

### **3. OPTIONS TO SERVE TARGETED GROWTH AREAS WITH LIMITED WATER SUPPLY**

Ms. Heinkel summarized discussion and commented she had not heard any issue raised to be prohibitive to any of the three (3) alternative growth scenarios. Mr. Elliott commented this could be because the group as a whole is optimistic and might be reflective of the level of detail of available information. Mr. Fujii commented the data is

being updated and is fairly detailed and is anticipating that the water availability, based on the new data, will not be much different than the numbers OWRD has been utilizing. Mr. Fujii said it may be best to maximize municipal resources by focusing them on governance and alternatives rather than spending the money on more detailed studies.

Mr. Elliott expressed concern about a “more straws in the ground” approach to water service; and raised questions concerning what approach serves the greater good. For example, closing down six or seven low functioning domestic wells to mitigate for municipal draw might be a preferred approach in a particular scenario. This approach also raises the issue of LCDC and limitations about how far outside of the UGB a jurisdiction can reach to address water availability. Ms. Schulz responded Region 2050 can address this concern through proposed changes to UGBs.

Mr. Fujii reminded the group that there is an entire spectrum of approaches with which to provide water service and many alternatives have not yet even been attempted. Ms. Schulz clarified from her perspective the biggest assumption to make is that water is available. Mr. Fujii added to this that the political will and fiscal ability to pay for water are primary factors.

Mr. Fujii went on to explain he sees three (3) supply scenarios:

- The way we have been providing service (“straws in the ground”) and municipalities try to gain water right certificates from senior water rights holders
- build a straw connecting to EWEB service
- build a straw in Fern Ridge (requires an Act of Congress)

Mr. Fujii also commented he sees a need for short, mid, and long term approaches to water supply; all of which may come down to demand paying the price. Ms. Brewer responded this is why she sees a return to urbanization in the not so far future. Ms. Brewer also asked for clarification on her comment that she did not see any prohibitive issues. Ms. Brewer said she sees many more unpredictable issues, higher cost, and more limitations in the Rural Growth Scenario compared to the other two scenarios. Ms. Heinkel said these concerns lead more to the question of is this (approach) good public policy than is the scenario possible.

Mr. Fujii noted perhaps Ms. Brewer is driving at assurance of water supply which would be high in the Compact Growth Scenario, dependent on willingness to pay in the Satellite Growth Scenario, and would be low in the Rural Growth Scenario. The group agreed the analysis should be closely linked with the goal of providing for health, safety, and the public welfare.

Ms. Heinkel then asked the group about Creswell’s options for obtaining more water. Mr. Taylor stated if the Lane Community College Basin develops EWEB could easily serve Creswell. Mr. Fujii noted if politics and funding align Creswell could purchase water from the Federal projects Ms. Schulz asked if it would be worthwhile to consider the question - could water availability serve as a factor which enhances rather than

limits development potentials. For example, Oakridge might have enhanced development potential because it has water available. Mr. Ingham presented Veneta's view that the City can meet any situation but the issues of water quality and financing could become a larger factor in some scenarios. Mr. Fujii gave the example of Keizer where a number of people treat their own water in their homes. Mr. Taylor commented it would be helpful to analyze the costs of water provision at this point. Ms. Heinkel pointed out that the numbers for Lowell have been corrected, but some corrections for Veneta remain.

#### **4. COST ESTIMATION METHODOLOGY**

Ms. Heinkel asked the group for feedback on the method she used to estimate the cost of domestic wells in the Rural Growth Scenario. Ms. Heinkel contacted two well contractors to obtain their expert opinion on the average total cost of a new domestic water system in the region. She then averaged the range (\$5,000-\$8,000/2 = \$6,500) and multiplied this by the number of new dwelling units in the Rural Growth Scenario. The group agreed that this approach made sense.

Mr. Elliott commented that the new small towns in the Satellite Scenario will need a community system capable of providing adequate fire flow. Mr. Fujii added in the past a steel tank for water storage ran approximately \$1.00-\$1.50 per gallon, but this depends on the price of steel which has been running very high as of late. Jerry Elliott estimated for a community system the cost per service connection could be \$1,700 plus \$400 connection fee for a total of \$2,100 per customer/dwelling. Mr. Hanley estimated the cost at \$4,000 based on costs Rainbow sees in the Marcola area and said it could very likely be higher than \$4,000 per unit in the Rural Scenario. Ms. Heinkel asked if there is the assumption that a larger system can serve more users for less cost. The group replied that in general this is true.

For the Satellite Growth Scenario the group agreed to use the \$4,000 per unit cost to serve the 2050 population in the three growth centers:

	<u>Population</u>	<u>Cost</u>
Pleasant Hill	11,777	\$19,628,333
Goshen	10,180	\$16,966,666
Alvadore	16,027	\$26,711,666

Cost is figured by dividing the population by 2.4 and multiplying this number by \$4,000.

Mr. Elliott emphasized the high cost of new infrastructure. Mr. Hanley mentioned the benefit of a long pipe to provide service in some of these scenarios is that curb, gutter, and sidewalks are not required. Compact Growth Scenario costs are driven by the need to extend capacity from the metro area out. The costs are skewed by the need to serve the outlying areas which prevents the full realization of an economy of scale. Mr. Fujii stated in a scenario with many stand alone water systems, the assurance of water availability is very limited. Ms. Heinkel noted that municipal systems are more heavily

regulated than private systems. Mr. Fujii emphasized the potential costs to health from private unregulated well systems. State and Federal regulatory agencies do not claim jurisdiction on these users. Many areas have water with heavy metals and nitrate problems which could lead to a high social cost (adverse health impacts to individuals) for a private well approach to water service.

The group agreed on the following criteria for the evaluation and ranked the alternative growth scenarios as follows. :

	<b>Compact</b>	<b>Satellite</b>	<b>Rural</b>	<b>Issues</b>
<b>Water Supply Availability</b> <ul style="list-style-type: none"> <li>✚ Reliability</li> <li>✚ Predictability of supply</li> <li>✚ Ease of service</li> </ul>	<b>H</b>	<b>H</b> except Creswell, Veneta, Coburg; <b>L</b> <b>(H if rely on EWEB)</b>	<b>L</b>	EWEB, and Cottage Grove have ample water rights and EWEB and SUB can share supply. In Satellite, water supply limits growth in Veneta, Creswell, and Coburg; but if EWEB provides the service, these cities would rate H in Satellite. In Rural, it is hard to site both wells and septic on one acre lots; availability highly unpredictable due to cumulative impacts.
<b>Capital Cost</b> <ul style="list-style-type: none"> <li>✚ Cost predictability</li> </ul>	<b>H</b>	<b>M</b>	<b>L</b>	Costs are relatively easy to project in cities; much harder in rural area due to so many unknown costs.
<b>Cost-Effective</b> <ul style="list-style-type: none"> <li>✚ Low capital costs</li> </ul>	<b>M</b>	<b>H</b>	<b>L</b>	The capital costs of the Satellite would be the lowest and the Rural the highest (see Table 1). The capital costs of the Compact would be higher than the Satellite due to the expense of extending lines to Alvadore, Goshen and Pleasant Hill.
<b>Efficient Service Delivery</b> <ul style="list-style-type: none"> <li>✚ Low operations and maintenance costs</li> </ul>	<b>H</b>	<b>H</b>	<b>L</b>	Operations and maintenance costs would be highest in the Rural Scenario due to the lack of centralized, general administration, operations, and maintenance (testing, power costs for pumping, treatment, etc.)
<b>Protect Public Health</b>	<b>H</b>	<b>H</b>	<b>L</b>	In Compact and Satellite, municipal systems are regulated and monitored under state and federal law; and qualified staff manage water treatment. Monitoring and testing are individual options for on-site domestic systems in Rural. Many areas have water with heavy metals and nitrate problems which could lead to a high social cost for a private well approach to water

				service.
<b>Maintain System Reliability</b>	<b>H</b>	<b>H</b>	<b>L</b>	Professional staff in Compact and Satellite are able to project needs and maintain systems. Maintaining individual systems less reliable because testing done at individual level and treatment options are more limited.

Mr. Fujii recommended Gail Glick Anderson of the OSU Extension Service to help with estimating the costs of private well maintenance.

Ms. Brewer commented that political will is a large factor to water service provision and asked the group to think about a way to link this with the number of available options. Mr. Elliott said a component considering market forces would be helpful to the analysis.

Mr. Fujii offered that the Compact Growth Scenario seems to offer the greatest assurance of water availability and would be the most predictable. Ms. Brewer stated the ease of service provision depends on the timing of development. Mr. Hanley also emphasized the social costs of private domestic wells in terms of cancers caused by heavy metals and blue baby syndrome caused by nitrates. He noted the costs of qualified staff to manage water treatment should be considered when estimating the costs of a particular service.

Mr. Fujii noted that stand alone systems will not have an easy time obtaining new water rights and thought the analysis should include gradations to address the three components of water availability: predictability, ease of service, assurance. He offered if the Satellite Growth Scenario includes larger cities sharing water, then it could rate as medium (M), but would rank as low (L) if it involved obtaining new, independent water rights. Mr. Taylor suggested the group identify assumptions and then move into a feasibility analysis. Mr. Fujii commented that if the group is discussing a situation which will occur decades from now, ESA issues could be satisfactorily addressed and accessing stored water currently held BOR remains as a strong possibility for future water supply. Ms. Heinkel summarized that there seemed to be very little difference between the Compact and Satellite Growth Scenarios. Mr. Hanley seconded and said it is really an issue of economy of scale. Mr. Fujii also recognized the similarity and said given the size of communities in the Satellite Growth Scenario 50 years from now, it is more similar than not to the Compact Growth Scenario.

Ms. Heinkel said she would add today's discussion to the notes from the previous meeting and provide this analysis to the RTAC for comment.

Ms. Hanley added a note that after World War II Marcola created a water district but did not create a community wastewater system, so it still has issues of water quality. Dexter represents a community which has created a community wastewater system but remains on private wells for water service.

Notes taken by Denise Walters.