

RESOLUTION NO. 1441

A RESOLUTION ADOPTING A PROGRAM TO CORRECT THE PROBLEM CREATING THE MORATORIUM ON PLANNING APPROVALS FOR LAND DEVELOPMENTS THROUGHOUT THE CITY OF WILSONVILLE DUE TO A LACK OF WATER SYSTEM CAPACITY

WHEREAS, on January 5, 1998, the Wilsonville City Council adopted Ordinance No. 493, which is an Ordinance adopting a moratorium on planning approvals for land developments throughout the City of Wilsonville due a lack of water system capacity; and

WHEREAS, Ordinance No. 493 declared an emergency to exist; and

WHEREAS, Oregon Revised Statutes 197.530 requires that a City that adopts a moratorium on construction or land development in conformity with ORS 197.520 shall, within 60 days after the effective date of the moratorium, adopt a program to correct the problem creating the moratorium. The program must be presented at a public hearing. The City is required to give at least 14 days advance notice to the Oregon Department of Land Conservation and Development (DLCD) of the time and date of the public hearing; and

WHEREAS, 14 days advance notice has been given to DLCD; and

WHEREAS, the public hearing has been scheduled for March 2, 1998, at 7:00 p.m.; and

WHEREAS, staff has developed a program to correct the problem creating the moratorium (Attachments A, B, C, and D); and

WHEREAS, the program has been available to the public for seven days prior to the public hearing; and

WHEREAS, the public hearing was conducted on March 2, 1998; and

WHEREAS, based on the staff report and public testimony (written and oral) the City Council finds that any further analysis should be limited to the Willamette River, Bull Run (Portland's alternative to Willamette River), and the Troutdale Aquifer; and

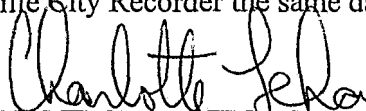
WHEREAS, the City will leave the record of this hearing open for seven (7) days, during which time the public shall have the opportunity to recommend additional alternatives that merit study during the moratorium; and

WHEREAS, the City Council hereby instructs the City Staff to further evaluate the options recommended in the proposed program to correct the problem creating the moratorium and report back to the City Council with recommendations no later than June 29, 1998.

NOW THEREFORE, THE CITY OF WILSONVILLE RESOLVES AS FOLLOWS:


Based on the above recitals and findings incorporated herein, the City Council of the City of Wilsonville adopts the program to correct the problem creating the moratorium, as shown in: Attachment A, "Program To Correct The Long Term Water Shortage Creating The Moratorium On Planning Approvals For Land Developments Throughout The City Of Wilsonville; Attachment B, "Schedule To Solve Water Moratorium"; and Attachment C, "Memorandum Dated February 23, 1998 to Eldon Johansen, Community Development Director, from Jeff Bauman, Public Works Director, regarding Review of Wilsonville's Water Supply Planning"; and, Attachment D, "Memorandum dated November 7, 1997, to Mike Kohlhoff, City Attorney, from Jeff Bauman, regarding Water Supply Planning".

ADOPTED by the Wilsonville City Council at a regular Council meeting thereof this 2nd day of March, 1998 and filed with the Wilsonville City Recorder the same date.



CHARLOTTE LEHAN, MAYOR

ATTEST:



SANDRA C. KING, CMC, City Recorder

SUMMARY of Votes:

Mayor Lehan	Yes
Councilor Kirk	Yes
Councilor Helser	Yes
Councilor Barton	Yes
Councilor Luper	Absent

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ATTACHMENT A

PROGRAM TO CORRECT THE LONG TERM WATER SHORTAGE CREATING THE MORATORIUM ON PLANNING APPROVALS FOR LAND DEVELOPMENTS THROUGHOUT THE CITY OF WILSONVILLE

Introduction

This report, together with the other attachments to Resolution No. 1441 constitutes the City of Wilsonville's program to correct the municipal water shortage that led to the enactment of a moratorium on new land development approvals on January 5, 1998 (Ordinance No. 493).

ORS 197.530, part of the State's Moratorium Statute, requires the City to adopt a program to correct the problem within 60 days of the enactment of the moratorium.

Summary

The City of Wilsonville must find an affordable, dependable, long-term source of water. It is needed to serve existing land uses and to serve the future growth of the community. Based on the best information available to the community at this time, there are three potential sources of water that may meet the City's criteria:

- * Willamette River;
- * Bull Run;
- * Troutdale Aquifer.

Based on available information, it is premature to focus on any one of those three alternatives without further consideration of the others.

Additionally, conservation will be used and aquifer storage and recovery (ASR) may be used to satisfy some part of the community's water needs on either a short or a long-term basis. The City must continue to consider those options as well, as components of the long-term solution.

The City will have limited resources with which to purchase or develop a new source of water. Once a decision is made to select a specific source of water, it must be the right decision. It must be a water source that is affordable and dependable over the long term. For this reason, the program outlined here includes more study of the options. This may very well be the single most important decision that the community has ever faced and it must not be taken lightly or hurried.

Program

The overall program to correct the long-term water shortage that led to the moratorium is scheduled in detail in Attachment B. The general summary is as follows:

Adopt the work program leading to correction of the long-term water shortage at the City Council meeting on March 2, 1998. At this Council meeting it will also be necessary to identify any other proposed alternative solutions to the long-term water problem and to curtail future consideration of any other alternatives for this particular work program.

Authorize staff to contract with the selected consultant to prepare a thorough analysis of the Troutdale aquifer as a water source for Wilsonville.

Authorize staff to work with the City of Portland to evaluate their proposal to serve the City of Wilsonville with Bull Run water.

Review growth projections and determine the projections for annual water requirements. This needs to be completed by March 20, 1998.

Continue to evaluate the three water source options listed above, along with any other alternatives that are brought forward at the March 2 public hearing and approved by the City Council for further study. In the analysis, include continued emphasis on water conservation and analysis of aquifer storage and recovery (ASR) as two essential components of the overall solution, neither of which can solve the problem by itself.

Present details on the Troutdale aquifer, Willamette River water treatment plant, and the City of Portland's proposal to provide Wilsonville with Bull Run water in lieu of a treatment plant on the Willamette River to the City Council during the late May and early June timeframe.

Continue to work with the City of Tigard and the Tualatin Valley Water District as they consider their options to construct and operate a water treatment plant on the Willamette River, and continue to work with the City of Portland as it considers its options as a supplier of water to the City of Wilsonville.

Continue to work with the Department of Corrections to develop an overall agreement concerning infrastructure support for a possible prison in the Wilsonville vicinity and the necessary agreement to provide water to the prison as a component of the overall agreement. Note that water service to a prison is only one component of the community's water system and is not expected to determine the outcome of the City's search for a long-term water source.

Coordinate with a selected consulting firm, to develop proposed water utility rates and systems development charges for any of the alternatives which are to be recommended for consideration by Council. The consultant has been selected to complete this rate study.

Adopt an increase in the water systems development charges to ensure that new development pays its fair share for the demands that the development places on the water system.

Recommend the preferred alternative or combination to the City Council for consideration and adoption in late June or early July.

Submit to the voters of the City of Wilsonville for an election to authorize the necessary financing and estimated change in utility rates to pay for the selected long-term alternative. (Although the City has the authority to sell revenue bonds, and to raise rates to retire those bonds, any such decision without an election would be expected to be referred to the voters by citizen action.)

Following the election, the City Council will decide to extend or cancel the moratorium. Assuming that the election is held on November 3rd, that decision could be made as early as the City Council meeting on November 16, 1998.

After the City Council selects the preferred long-term option, review the probable time that would be required to obtain long-term water from that preferred option. When that time-line is known, the availability of near-term water, as compared to projected water requirements, will be evaluated to ensure that there is near-term water available to "bridge the gap" until the long-term source is on line.

Legal Issues Associated with the Program of Correction

Each of the potential sources of water involve resolution of legal concerns. These concerns involve, among other things, review of the constitutional, statutory, charter, and ordinance authority to enter

into governmental and private agreements; to enter into extra-territorial acquisition of property and easements, if needed; to enter into long-term obligations based upon future appropriations, assessments and bonding authority; and to comply with or obtain approvals under a myriad of land use and water resource regulations promulgated by and reviewed in city, county, or state administrative processes. Depending on the potential water sources involved, the time frame for resolution of the legal concerns as well as the probability of a favorable legal outcome will also differ. The variables are complex and their legal assessment needs careful study to evaluate the legal risks involved. An ambitious time-table has been included in the overall schedule of tasks to be accomplished.

**ELDON R. JOHANSEN
COMMUNITY DEVELOPMENT DIRECTOR**

Additional Attachments:

- B. Schedule to Solve Water Moratorium
- C. February 23, 1998, memo from Jeff Bauman to Eldon Johansen
- D. November 7, 1997, memo from Jeff Bauman to Mike Kohlhoff

ATTACHMENT B

Schedule to Solve Water Moratorium			
	2/23/98		
Activity	Required Completion	Responsibility	Status
Solicit proposals to evaluate Troutdale aquifer for viability as a long term water source	2/6/98	Eldon	Done
Notice to DLCD of Public Hearing	2/13/98	Stephan	Done
Public notice of Public Hearing on 3/2/98	2/17/98	Stephan	Done
Complete Draft Program for staff review	2/18/98	Eldon, Jeff & Stephan	Done
Complete program for distribution to public	2/23/98	Stephan	
Review proposals to evaluate Troutdale aquifer, select proposed consultant, negotiate scope of work and price	2/26/98	Jeff/ Mike S	
Conduct Public Hearing	3/2/98	Council	
Approve program to solve moratorium	3/2/98	Council	
Approve consultant agreement or delegate approval to PW Dir to evaluate Troutdale aquifer	3/2/98	Council	
Final date for submission of alternative sources as a consideration for current program to end moratorium	3/2/98	Council	
Develop public information program & schedule	3/9/98	Dave	
Check validity of projections in annual growth in water requirements and projections of required added water	3/20/98	Eldon	
Finalize agreement with DOC	3/25/98	Michael K Arlene/ Mike S/	
Finalize agreement with Tigard & TVWD	3/25/98	Michael K	
Prepare & distribute preliminary legal analysis of municipal use of Troutdale aquifer	4/3/98	Michael K/ Joan	
Propose alternatives for analysis of rate & SDC impacts and discuss at a study session	4/20/98	Eldon/Jeff/ Arlene	
Receive & distribute preliminary results of Troutdale aquifer study to staff	5/8/98	Jeff	
Coordinate with CH2M Hill & complete rate & SDC analysis of alternatives	5/8/98	Eldon	
Distribute methodology and draft of ordinance adopting an increase in water systems development charges 30 days before adoption of the increase	5/14/98	Eldon	
Prepare & distribute final legal analysis of municipal use of Willamette River	5/18/98	Michael K/ Joan	
Presentation & discussion of Willamette pilot plant study & preliminary plans for a proposed Willamette water treatment plant	5/18/98	Council	
Receive & distribute final draft of Troutdale aquifer study to staff & Council	5/22/98	Jeff	
Prepare & distribute final legal analysis of municipal use of Troutdale aquifer	5/22/98	Michael K/ Joan	
Presentation & discussion of information about long term water supply from Portland	6/1/98	Council	

ATTACHMENT B

Schedule to Solve Water Moratorium			
	2/23/98		
Activity	Required Completion	Responsibility	Status
Presentation & discussion of Troutdale aquifer study	6/1/98	Council	
Develop draft of ordinance extending water moratorium for staff review	6/1/98	Stephan	
Public notice of Hearing on 6/15/98	6/1/98	Stephan	
Provide 14 days advance notice to DLCD of public hearing to discuss extension of water moratorium	6/1/98	Stephan	
Develop and coordinate proposed long range solution to water moratorium	6/8/98	Eldon/ Jeff/ Arlene	
Distribute draft ordinance extending the water moratorium to public	6/8/98	Stephan	
Conduct public hearing to extend moratorium	6/15/98	Council	
Adoption of an ordinance increasing water systems development charges to reflect increased cost of capital for water production	6/15/98	Council	
Discussion, selection, & approval of long range water supply solution (Would a special mtg on the 29th be possible?)	6/29/98	Council	
Develop resolution providing language to be used on November ballot	7/13/98	Michael K	
Adopt language for November ballot	8/17/98	Council	
Notice of Public Hearing on extension/cancellation of moratorium to DLCD & public	11/2/98	Stephan	
November election on financing new water source	11/3/98	Citizens	
Determine estimated availability of long term source and review short term requirements and supply to insure that adequate short term water is available until long term water is available.	11/16/98	Eldon	
Council decision on extending or canceling moratorium	11/16/98	Council	

City of

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MEMORANDUM

DATE: FEBRUARY 23, 1998

TO: ELDON JOHANSEN,
COMMUNITY DEVELOPMENT DIRECTOR

FROM: JEFF BAUMAN,
PUBLIC WORKS DIRECTOR

RE: REVIEW OF WILSONVILLE'S WATER SUPPLY PLANNING

Historically, Wilsonville has relied upon wells in the local aquifer as its sole source for municipal water supply. However, in the early 1970s it became evident that local aquifers would not be adequate to meet the needs of this growing community. To assure a long-term supply, Wilsonville applied for and was eventually granted a municipal water right to the Willamette River. This right in the amount of 30 cubic feet per second (which translates to 19.4 million gallons per day) has a priority date of 1974, making it among the most senior of municipal water rights for this portion of the Willamette River.

Meanwhile as Wilsonville continued to grow, additional wells and pumping capacity have been installed. This has accelerated the depletion of the local aquifer. When the State of Oregon Water Resources Department granted Wilsonville a permit to drill its eighth (and final) well, one of the permit conditions stated in part: "The City of Wilsonville understands that reliance on ground water for a long-term water supply is unacceptable."

Beginning in 1992, Wilsonville has experienced varying degrees of water shortages each summer during periods of peak demand. These shortages have been addressed by a combination of: voluntary and mandatory water curtailment practices; deepening existing wells to increase their productivity; drilling an additional well; and installing additional reservoir storage capacity. The unprecedented growth of recent years has increased peak water demand to the limit of the City's ability to meet such demand - - even with all the operational and capital improvements being undertaken. All the while, the water table in the city's aquifer has been dropping, and this rate of depletion is accelerating as the City withdraws larger and larger quantities of water out of the ground.

Since 1989 Wilsonville has been actively involved in numerous efforts to secure a sustainable long-term water supply. A summary of these activities is included in my November 7, 1997, memo to Mike Kohlhoff (copy attached). Altogether, the planning efforts alone represent approximately \$4 million of work, of which Wilsonville's share has been more than \$368,000. In addition, the City is hiring an independent engineering consultant to further analyze the Troutdale aquifer south of Wilsonville as a potential source for future municipal water supply.

The remainder of this memo is a review of the water supply options which have been considered. I've structured the discussion in three categories: potentially viable long term sources; activities which significantly reduce peak season requirements, but which



cannot themselves meet the long term need; and options which do not effectively address the long term need.

I. POTENTIALLY VIABLE SOURCES

Bull Run

An interconnected regional water system to the north of Wilsonville is supplied by water from Portland's Bull Run watershed, and to a lesser extent from the Trask/Tualatin watershed. At the current time the water from these sources is available in excess of the demand from their respective service areas. Over time, however, these providers will need this water to serve growth in their own customer bases. According to the Regional Water Supply Plan (RWSP), all existing and committed sources of water will be fully utilized by approximately the year 2035, at which time a major new increment of water supply will be needed.

Potentially, the new increment of water supply could be the expanded utilization of the Bull Run watershed. This would require construction of an additional (i.e., third) dam in the Bull Run system. Given the status of environmental regulations, it is questionable whether construction of another dam is possible. Related concerns include impacts on salmon and steelhead runs being considered for listing as threatened/endangered species. It would literally take an act of the U.S. Congress to authorize a third dam in the Bull Run, and if this were to occur it would likely be 30 to 40 years before such an impoundment is constructed and operational.

Alternatively, the height of one of the existing dams could be increased and a water filtration plant could be added to the Bull Run system. A higher dam would impound more water in the reservoir. And a filtration plant would allow greater draw down of the water level during peak summer months. Currently such draw down is limited because of turbidity problems when the reservoir level is low. Portland estimates the cost of a higher dam plus filtration plant would be in the range of \$120 - 150 million. In addition, larger water transmission lines would need to be installed to deliver the needed quantities of water to Wilsonville. The cost of such transmission lines would be tens of millions of dollars, depending on the size and alignment of these facilities. If this option were selected, a series of interagency commitments would need to be made regarding the timing and cost sharing for the necessary capital improvements.

At best it would be a decade or two before major expansion of the Bull Run supply could be brought on line. In the meantime, it seems possible to provide Wilsonville with approximately 3 million gallons a day of "excess" Bull Run water. This would entail optimizing the capacity of existing transmission lines in the Portland, Tigard, and Tualatin water distribution systems. It would also necessitate unprecedented coordination between numerous water supply agencies to wheel the water from its source to Wilsonville.* Such considerations include:

* Similar short term arrangements could be made with water providers in the Clackamas basin to supplement Bull Run for delivery of approximately 3 million gallons per day to Wilsonville.

The new Joint Water Commission facility improvements would be operated in a way that assures the Tualatin Valley Water District (TVWD) obtains 12 million gallons per day, thereby enabling TVWD to reduce its purchase of Bull Run water. This "freed up" Bull Run water then becomes available for sale to other wholesale customers, such as Wilsonville.

The Columbia South Shore Well Field is available to the Portland Water Bureau not only for emergency backup supply, but also to meet maximum daily demand during the peak season.

The Portland Water Bureau would have to re-route water service in its Washington Park and Burlingame supply systems, and conduct further system hydraulics analyses to determine whether opportunities are available to increase transmission capacities through these systems.

Connections would need to be constructed at key locations in the existing transmission system.

The cities of Portland, Tigard, Tualatin, Sherwood, Wilsonville and the Tualatin Valley Water District would have to coordinate the daily (and at times hourly) storage and release of water as it flows through each jurisdiction from source to end user.

Mutually agreeable funding, ownership, operational, and maintenance arrangements would need to be formalized.

The cost of water supplied would have to be agreed upon by all parties involved.

Troutdale Aquifer

An extensive, relatively shallow, relatively porous underground zone known as the Troutdale formation is located south and east of Wilsonville's city limits. This aquifer contains vast quantities of ground water, and it has been suggested that Wilsonville consider it as a source for future water supply. Until recently the City did not view the Troutdale aquifer as a viable alternative because: years of study by 27 water providers in the Portland metropolitan region (plus Metro) concluded that ground water should not be a primary source to meet future demand; the permit issued to Wilsonville by the state for purposes of constructing municipal wells indicates that "reliance on ground water for a long-term water supply is unacceptable;" and it has been the City's understanding that state and county land use agencies have concerns about the extension of urban infrastructure into designated agricultural areas. Nonetheless, if the Troutdale aquifer is a viable source for Wilsonville's future water supply, it should be an alternative that is given full consideration. The Oregon Water Resources Department has clarified that the language cited in the permit for our final well is a restriction on the use of the basaltic aquifer, and does not necessarily restrict Wilsonville from using water from the Troutdale aquifer. Accordingly, an independent engineering consultant is being hired to conduct a technical, regulatory, and financial analysis of the Troutdale aquifer as a potential water supply for Wilsonville. The results of this study will be available by June, 1998.

Willamette River

As noted earlier in this memo, planners decades ago foresaw the need for Wilsonville to secure a new source of water to meet the future needs of this growing community. The City currently holds a water right for municipal use of the Willamette River in the amount of 19.4 million gallons per day. This volume of water, if coupled with a conservation program and local wells during peak summer periods, would be sufficient to meet the needs of the City at full development (including adjacent lands designated as urban reserve) based on the comprehensive plan. The Regional Water Supply Plan acknowledges Wilsonville's need for a new source of water as follows:

"The Regional Water Supply Plan process has focused primarily on regionally significant demands and resource options. The process did not address in detail the fact that certain localities in the region are facing more imminent needs than others. Examples of those entities which are likely to need new resource capacity prior to 2000 include the cities of Wilsonville, Tigard, Sherwood, Canby, and possibly the Damascus Water District.

This plan recognizes that steps must be taken in the near-term to meet these demands. . . On the supply side, seemingly plausible source options (due to availability of existing systems, proximity to alternative sources, and water rights availability) include connection and contracted purchase of water from existing systems (e.g., Bull Run, Clackamas), ASR, or construction of first phase supply facilities on the Willamette River."

Currently the City of Corvallis uses the Willamette River as its water supply. A conventional water treatment plant is in operation which provides finished water that meets federal and state drinking water standards. Because the Willamette River downstream of Corvallis is subject to additional contamination, the question has been raised whether the river water in Wilsonville is too polluted to be safely used as a water supply. To evaluate and address this concern, several steps are being taken to assure that if the Willamette River is utilized for water supply, the water delivered to our customers will be safe to drink.

A pilot project was conducted to measure contaminant levels in the river, and to demonstrate the effectiveness of water purification processes in removing whatever pollutants are present. Water samples were analyzed for all the chemicals regulated under the drinking water standards plus other unregulated chemicals suspected to be of greatest concern in the Willamette watershed. In sampling over a two-year period, the vast majority of chemicals were not detected (even at trace levels) in the "raw water" taken from the river. Those chemicals that were measurable in the samples existed at low levels, and all were readily removed when processed through the pilot purification plant. The extensive findings and conclusions of this multi-year study are contained in a series of reports.

If the Willamette is used for municipal water supply, the City would construct a "multi-barrier" water purification plant which would more than merely meet state and federal drinking water standards. Steps beyond conventional water treatment

would be included to break down chemicals and remove organic pollutants, regardless of whether state or federal standards exist for them.

In addition to the water purification plant itself, further safeguards would assure the reliability of water supplied to customers. The City's contingency systems would include expanded water storage capacity; maintenance of City wells for backup supply; and constructing an interconnection to City of Tualatin's water transmission system for emergency service. Should the purification plant be taken off line for any reason, these contingency supplies would be available.

The City would support efforts to reduce water pollution in the Willamette basin. The Governor's Task Force on the Willamette River points out that municipal water supply is a designated use of this resource, and the Task Force has recommended over 100 steps be taken to protect and improve water quality in the Willamette. As these recommendations are implemented, the river will become cleaner and easier to treat.

The Willamette River is one of the very few options which is capable of meeting Wilsonville's long term water supply needs. It is also the option which is least dependent on decisions/actions of other agencies in terms of commitments or approvals needed. Nonetheless if a purification plant is built and operated, it would be financially advantageous for Wilsonville to partner with the City of Tigard and others who have a similar interest in the Willamette as a source of water.

II. ACTIVITIES WHICH SIGNIFICANTLY REDUCE PEAK SEASON REQUIREMENTS

Water Conservation

The City has been involved in water conservation activities (both voluntary and mandatory) every summer since 1992. Attached to this memo is a summary of the water conservation actions taken during the summer of 1997. While it is not possible to determine what the level of water consumption would have been without these measures, we've estimated that on peak days conservation measures have reduced overall demand by 13%. It is our goal to achieve at least 17% reduction in peak demand by implementing an even more vigorous conservation program. We believe these efficiencies can be gained by modifying the pricing structure of water service to provide further financial incentives for conservation; by increasing our public information and technical assistance efforts; and by updating the City Code to revise landscaping requirements in a way that promotes native and drought-tolerant vegetation (rather than turf and other irrigation-dependent plantings). Achieving the 17% goal translates into a savings of approximately 1 million gallons on days of peak demand in the near term, and could reduce peak demand by approximately 4 million gallons per day in the long term (i.e., at "build out" of the entire City). This goal is consistent with the conservation target recommended in the Regional Water Supply Plan.

Some people have suggested that the goal of 17% is too modest, citing the more ambitious accomplishments of communities in the Southwest and in California. While it is technically possible to conserve more water, those communities essentially had little choice in the matter. Water simply was not available. Experience suggests that a 17% to 20% reduction in peak demand is perhaps an upper limit on sustainable conservation when other water supply options are available.

Aquifer Storage and Recovery (ASR)

Water usage goes through seasonal cycles with peak demand in the summer months - - at the very time water supply is scarcest. The ASR procedure is a method to capitalize on available water in the winter months (when supply is high and demand is low) and store this water in underground aquifers for subsequent withdrawal during the peak demand period in the summer. In a way this can be thought of as a huge underground reservoir with no walls. This procedure is gaining regulatory agency acceptance as successful pilot projects demonstrate the ability to inject/withdraw water without plugging the well field, without contaminating the naturally occurring water table, and without interfering with adjacent groundwater resources. It should also be noted that ASR is one of the options recommended in the Regional Water Supply Plan.

In evaluating Wilsonville's water supply situation, ASR looks promising for several reasons.

Throughout the fall, winter and spring seasons, large quantities of relatively inexpensive water is available for Wilsonville to purchase from any or perhaps all of the sources described in the preceding pages. Not only do water supply agencies throughout the region have excess water during non-peak months of the year, but such water is likely to be available for many decades into the future (as opposed to "excess" water in the summer, which is available for only a few years).

Wilsonville's aquifer lends itself exceptionally well to ASR. The deep basaltic rock formation provides a suitable zone for injection/withdrawal of water. Intense pumping of this aquifer as Wilsonville's only source of water has resulted in the lowering of the water table at a rate of two to four feet per year. This has not only reduced the productivity of the well field, but is also increasing the concentration of iron and manganese in the well water as we pump from deeper levels containing higher mineral content. The "good news" is that by this substantial lowering of the water table, there is now room in the aquifer for very large quantities of water. For each million gallons per day injected into the aquifer during 9 months of the year, three million gallons per day could be extracted during maximum peak days in the summer.

Some of the needed infrastructure is already in place. Wilsonville has a series of well sites which could be adapted for both injection and withdrawal of ASR supplies. Furthermore, during non-peak times of the year, jurisdictions near Wilsonville are not using the full capacity of the water transmission lines currently in place. Millions of gallons per day could be transferred through the existing transmission system to Wilsonville for purposes of ASR. While some coordination would be necessary among impacted agencies, the type and extent of operational

responsibilities in the "off season" would be greatly simplified compared to the level of activity associated with peak season transfer of water into the Wilsonville service area.

If the City were to build a water purification plant using the Willamette River as a supply, ASR could be used in conjunction with such a plant to keep capital and operating costs at a minimum. Rather than design a purification plant to meet peak summer demand, a smaller plant could be built and operated at more or less a steady rate of production all year long. In the winter, "excess" water from the purification plant could be stored in the underground aquifer. In the summer, this stored water could be withdrawn from the aquifer on peak days. Not only would the smaller purification plant reduce construction costs, but operating such a facility on a "steady state" basis is a more efficient and reliable way to treat the water.

By raising the level of the water table in the aquifer, several benefits could be achieved. The City would no longer be drawing from the deeper levels and would thereby reduce the problems associated with iron and manganese content of the groundwater. The efficiency and productivity of the existing wells would be improved. And interference (if any) with nearby private wells would be eliminated. In fact, if there is any connection with neighboring wells, they could benefit from ASR.

In the past, the State's ASR permitting process has taken approximately 5 years for required site-specific pilot testing and subsequent authorization for full-scale operation. Recently this approval process has been streamlined somewhat. With a year of feasibility study plus a year of pilot testing, it is conceivable under a "best case" scenario that the City could have at least some ASR on line within three years of the decision to pursue this method. It would nonetheless be 5 years or so before approval could be obtained for permanent, full-scale use of ASR. There is not yet enough experience to accurately determine the capital, operating and maintenance costs for application of ASR to Wilsonville's aquifer. And while this technique seems encouraging, it is only a partial solution to Wilsonville's long term water supply needs.

III. OPTIONS WHICH DO NOT EFFECTIVELY ADDRESS THE LONG TERM NEED

Local Aquifer

As noted above, existing development (not to mention future growth) is depleting this resource. At best, the wells could be used as a supplemental source to meet demand on peak summer days. The wells could also be available as a year-round backup supply in the event of an emergency and/or temporary interruption of the new (primary) source of water. Another potential use of the local aquifer could be for ASR as described above.

Wilsonville's wells tap a thick layer of water contained in a massive basalt formation 300 to 700 feet beneath the City. Groundwater is also present at shallower levels above the basaltic rock. Indeed, private wells in and adjacent to Wilsonville already draw water

from this shallower formation. It has been suggested that the City use its wells in the deep aquifer only for domestic (i.e., indoor) uses and that the shallower aquifer be used for outdoor uses - - particularly landscape irrigation during peak demand in the summer. This would necessitate extensive changes to the water distribution system throughout the City and/or widespread installation of new private wells. Furthermore, owners of active (shallower) wells in the area report that the water table is dropping due to current usage. It does not appear the shallower local aquifer could sustain repeated, large-volume withdrawals of water. Thus it does not seem practical to tap the shallow local aquifer on a large enough scale to make a significant contribution toward solving the City's water supply problem.

Clackamas River

Just as water could be delivered to Wilsonville from suppliers to the north, so could Wilsonville be supplied by water from purveyors in the Clackamas basin. In the near term, the Clackamas basin as a whole is capable of supplying more water than is used by customers within that service area. The City of Lake Oswego and the Clackamas River Water District have expressed interest in selling water to Wilsonville. However, both these agencies have indicated that they are unable to guarantee water to Wilsonville beyond a 7 - 10 year time frame. Eventually all water providers within the Clackamas basin will need their entire capacity to meet growth within their respective service areas. The Regional Water Supply Plan indicates that by the year 2035 the Clackamas service area will no longer be self-sufficient in terms of water supply, and will need to obtain water from outside the basin.

There are three ways "excess" water in the short term could be wheeled from the Clackamas basin to Wilsonville. There is an existing transmission connection from Lake Oswego to Tigard. From there, the same water distribution system could be used as described above when considering the purchase of water from the Bull Run system. A second, less direct, method to transport water to Wilsonville would utilize a connection between the Clackamas basin and the Bull Run system. In essence, "excess" water from the Clackamas basin would be delivered to customers in the Bull Run service area thereby freeing up Bull Run water for delivery to the west through Tigard and Tualatin, ultimately reaching Wilsonville. Either of these delivery mechanisms would require the same (or perhaps greater) level of cooperation and coordination among numerous agencies as explained previously. And the maximum amount of water that could be delivered to Wilsonville through the existing transmission system is approximately 3 million gallons per day.

The third and most direct method of delivering water from the Clackamas basin would be to construct a new transmission main from the source to Wilsonville. It would not be cost effective to size and build such a pipeline merely to meet short term needs. Yet a transmission line with a capacity of at least 20 million gallons per day would cost tens of millions of dollars, depending on the size and alignment of the pipeline. It only makes economic sense to build such a transmission line if there is some assurance of a long term supply of water - - a commitment that Clackamas providers are unable to make.

Willamette River (for non-potable use)

This option would require little or no purification, and would use water from the Willamette for landscape irrigation purposes. In practice, however, this option has several limitations. It would require installation of a separate water transmission system, which would be feasible only for large irrigation users (who, by the way, have been very cooperative by curtailing their water use during peak demand periods). As such, this component of peak demand has already been discounted in future forecasts as part of the 17% reduction due to conservation practices. If the Willamette is to significantly address overall demand for peak season irrigation use, a city-wide network of (non-potable) water lines would have to be installed. This would not only entail large cost and disruption, but it would create health risks if unsuspecting people mistakenly took a drink of this non-potable water from a garden hose or used this water in their children's wading pools. For all these reasons, use of the Willamette on a massive scale for non-potable purposes does not appear to be a feasible solution to Wilsonville's water supply problem.

Re-use of "Gray Water"

The term "gray water" applies to wastewater other than that discharged from toilets. Thus "gray water" includes such things as water from sinks, dishwashers, washing machines, bathtubs, showers, etc. Some people have suggested that "gray water" be used for non-potable purposes such as outdoor watering during the summer. While this could reduce the peak demand on the City's municipal water supply, there are significant practical limitations to this option. It requires extensive re-plumbing of virtually all buildings in the City, and it raises potential difficulties. State regulations are very restrictive about re-use of "gray water" because such water contains bacteria and other contaminants of potential health concern - - particularly if the untreated "gray water" is stored for any length of time allowing bacteria to incubate. For all these reasons, the re-use of "gray water" on a massive scale is not a feasible solution to Wilsonville's water supply problem.

Use of Cisterns

A cistern is essentially a container or tank whereby rainwater can be collected and stored for use at a later time. People have suggested that cisterns could be helpful in providing water for non-potable uses and thereby reduce peak demand on the City's municipal water system. To be of any significant help during peak season demand, cisterns would have to be installed on a massive scale on individual properties. Alternatively, larger cisterns (in the range of 30,000 to 50,000 gallons) would have to be installed to serve each 10 square block area. There would need to be an apparatus to collect rainwater plus a tank (either above ground or underground) to store the water. A series of plumbing connections and/or pumping facilities would have to be installed to deliver the water for the intended uses, presumably outdoor irrigation. Due to the potential for uncontrolled bacterial growth or other possible contamination in the cisterns and distribution system, backflow prevention devices would be needed to assure this water doesn't flow into the domestic water lines. Even if these considerations were satisfied, it is questionable whether

adequate rainwater is available to replenish storage levels in the cisterns during extended periods of peak demand in the summer months. An alternate use of cisterns would be for fire protection only. However, there are only limited areas in the City where cisterns could possibly be used for this purpose. Thus cisterns are of limited utility in addressing Wilsonville's water shortage and are not a feasible solution to meet the City's long term water needs.

Re-use of Treated Wastewater

Some people have suggested that effluent from the City's wastewater treatment plant could be used for non-potable purposes and thereby ease demand on the municipal water system. In fact, this is occurring to a limited extent. At the City's new wastewater facilities, treated effluent is being used for processes within the plant that were previously supplied by the municipal water system. Similarly the treated effluent could be used for irrigation of nearby landscaping (such as Boones Ferry Park) during the summer months. Thus where it is feasible to do so, effluent can and will be used for non-potable purposes. However, on a broader scale it is not practical to rely upon treated wastewater to address the City's overall water shortage for the reasons discussed in the sections above regarding the use of the Willamette for non-potable supply. It should also be noted that the total output of the wastewater treatment plant during summer months is less than 3 million gallons per day. Even if all the effluent were re-used, it would not be enough to address the City's water shortage.

Corral Creek

To the west of Wilsonville is a stream referred to as Corral Creek. Historically, impoundments (for agricultural purposes) have been built in this watershed. It has been suggested that the City use water from these impoundments - - or perhaps build a new dam - - to meet future demand for municipal water supply in Wilsonville. Given the needs for this water to support in-stream and agricultural uses, it is unlikely the State would authorize Wilsonville to withdraw large quantities of water from Corral Creek. But even if such water rights were granted, the cost of building/improving the necessary impoundments plus the cost of associated water treatment and transmission would be greater than other, more viable water supply options. Thus Corral Creek does not appear to be a promising source for the City's future water supply.

CONCLUDING REMARK

Several factors will need to be considered in selecting Wilsonville's future water supply. These factors include: health and safety, reliability, environmental stewardship, efficiency, certainty of future supply, degree of local control, compatibility with regional plans and programs, cost effectiveness, and time frame for implementation. It will also be important to distinguish between alternatives that truly address our water supply problem versus measures that merely "buy time" while the underlying problem gets even worse.

MEMORANDUM

DATE: NOVEMBER 7, 1997
 TO: MIKE KOHLHOFF
 FROM: JEFF BAUMAN *JB*
 RE: WATER SUPPLY PLANNING

Over the past years, the city of Wilsonville has undertaken numerous steps to address future water supply needs. The following list identifies key activities that have occurred, with emphasis on planning and engineering studies that have occurred.

- 1989: Regional Providers Advisory Group
 Technical staff representing 35 agencies (including Wilsonville) convened monthly to discuss/coordinate water supply issues of regional interest.
- 1991-92: "Water Source Options Study"
 This engineering study represented Phase I of a regional planning effort. It evaluated 29 potential sources of water for the Portland/Vancouver metropolitan area. It concluded that 6 of these options merited further analysis. The study was conducted for the 35 agencies of the Regional Providers Advisory Group, which included the city of Wilsonville. The study was conducted by an engineering consulting team headed by CH2MHill.
- 1992 to present: Water conservation efforts and/or curtailment programs have been implemented every summer in Wilsonville (ranging from public education and requests for voluntary reduction in water usage, to mandatory restrictions during peak demand periods).
- 1992-94: Willamette River pilot plant
 A pilot-scale water treatment facility was set up in Wilsonville to demonstrate how "raw water" from the Willamette River could be treated with readily available technologies to provide water which meets all federal and state drinking water standards. The project was conducted by the Tualatin Valley Water District, with support from the city of Wilsonville.
- 1993: Second Elligsen reservoir placed in service.
- 1993: Canyon Creek well placed in service.
- 1993-96: "Regional Water Supply Plan"
 This engineering study represented Phase II of the regional planning effort. It evaluated the 6 most promising supply options in greater detail and concluded that a combination of sources (including the Willamette River) should be protected



and be available to meet future potable water needs of the region. The study was conducted by an engineering consulting team headed by Barakat & Chamberlin. Wilsonville was one of 28 agencies participating in this study.

- 1996: "Water Conservation and Management Plan"
This state-mandated report was prepared for Wilsonville by Montgomery Watson (consulting engineers). The report described the city's water resources, how to manage them efficiently, and forecasted future water supply needs of the city.
- 1996: "Willamette River Water Supply Study"
This engineering study evaluated potential service areas and water demands which might be served from a Willamette River water treatment plant. The lead agency for this study was the Canby Utility Board. The other participating agencies were: Wilsonville, Sherwood, Tigard, Tualatin Valley Water District, and Clackamas River Water District. The consulting engineer was Montgomery Watson.
- 1996: "Willamette River Water Treatment Plant Project Sizing and Regional Network Analysis"
This engineering study evaluated potential water treatment plant sites and water transmission line routes for supplying potable water from the Willamette River. The lead agency for this study was the city of Wilsonville. The other participating agencies were: Tigard, Sherwood, Tualatin, Tualatin Valley Water District, Canby Utility Board, and Clackamas River Water District. The consulting engineer was Montgomery Watson.
- 1996-97: "Clackamas Basin Water Treatment and Supply Options Study"
This engineering study evaluated alternative methods, sites, and transmission routes to develop additional water supply from the Clackamas River to meet future demand within the Clackamas sub-region - - and to potentially "export" water to other service areas (such as Wilsonville). The lead agency for this study was Clackamas River Water District. The other participating agencies were: South Fork Water Board, Oak Lodge Water District, Mt. Scott Water District, Damascus Water District, Gladstone, Lake Oswego, Milwaukie, Portland, and Wilsonville. The lead consulting firm was Black and Veatch.
- 1997: "Water Supply Study"
This engineering study evaluated alternative methods to meet the near-term and long-term water supply needs of the city of Wilsonville. It concluded that for Wilsonville, the least costly and most reliable future source of water would be the Willamette River. This study was conducted by Montgomery Watson (consulting engineers).
- 1997: "Washington County Supply Line Capacity Analysis"
This engineering study evaluated methods to divert water from the Trask/Tualatin and Bull Run water supplies to meet peak summer demand in portions of Washington County and in Wilsonville. The study pointed out that any such diversions would be interim in nature and would not address the long-term needs

of the participating agencies. The lead agency for this study was the city of Tigard. Other participating agencies included: Wilsonville, Tualatin, Sherwood, Portland, Tualatin Valley Water District, and Clackamas River Water District. The consulting engineer was Murray, Smith & Associates.

1997 (ongoing): Regional Water Providers Consortium

This group of 28 agencies is an outgrowth of the Regional Providers Advisory Group. All 28 agencies have endorsed the Regional Water Supply Plan, and have designated elected officials from their respective governing bodies to serve on the Regional Water Providers Consortium Board. Wilsonville Mayor Charlotte Lehan was elected Vice-Chair of this Board.

1997 (ongoing): Columbia-Willamette Water Conservation Coalition

Wilsonville has joined this group of 18 agencies which work cooperatively to establish conservation goals, provide public information/technical assistance, and evaluate the effectiveness of conservation efforts. Wilsonville Public Works Director Jeff Bauman serves on the "core team" (i.e., steering committee) of the Coalition.

in process: "Willamette River Water Treatment Plant Project Concept Design"

This engineering study is a detailed site analysis as well as technical/financial feasibility analysis of a Willamette water treatment plant designed to meet Wilsonville's long-term water supply needs. The study is scheduled to be completed in 1998. The consulting engineer is Montgomery Watson.

in process: Construction has begun on the Boeckman well, which should be in service by the summer of 1998.

in process: Bids are being solicited for construction of an additional reservoir (2 million gallon capacity) to be in service by the summer of 1998.

Summer '97

City of Wilsonville
Water Conservation Actions Taken

- * Conservation insert in utility billings (late spring)
- * Free plumbing fixture "check-up" kits
- * Site visits to customers whose '97 consumption was significantly higher than '96 (check for leaks; encourage conservation)
- * "Compassionate Leak Repair" policy (i.e., financial incentive to fix leaks quickly)
- * Articles in "Boones Ferry Messenger"
- * Articles in "Seedling"
- * Articles every week in local newspaper throughout the peak season
- * Personal phone contact throughout the summer with 30 largest outdoor water users
- * Participation in regional "water audits"
- * Mandatory restrictions on outdoor watering
- * City ceased watering parks and landscaping
- * Direct mailing from City Manager and Fire Chief
- * Door hangers when wasteful practices observed
- * Final warnings and daily water meter readings for suspected violators

NOTE: New development in the past year should have increased peak season water consumption by 150,000 to 200,000 gallons per day. Instead, peak season consumption decreased by 150,000 gallons per day - - before mandatory restrictions were placed on outdoor watering. It appears more customers are incorporating conservation into their regular practices.

Additional Activities for the coming year:

- review/modify pricing structure to provide further financial incentives for conservation
- xerophytic demonstration project
- investigate irrigating park(s) with Willamette River water
- update City Code - - including revisions to landscaping requirements
- active participation in Water Conservation Coalition

SPECIAL REPORT

A Portland city commissioner offers a plan to area cities to choose Mount Hood's Bull Run over the Willamette River as a source of drinking water. He resurrects an idea to raise the height of a dam on the reservoir.

Old idea for Bull Run might provide water solution

By R. GREGORY NOKES

of The Oregonian staff

Proponents of a water treatment plant on the Willamette River will try to convince a group of regional water providers Wednesday that the Willamette is the best choice of some cities for a new water supply.

Most members of the Regional Water Providers Consortium have supported a Willamette option in the past, but Portland's representative, City Commissioner Erik Sten, says it doesn't have to happen.

Sten, who is in charge of the water bureau, said Portland can guarantee pure Bull Run water to the region's cities for the next

10 to 20 years, and much longer if they agree to help raise the height of one of the two Bull Run dams and help build a filtration plant.

Tigard is the only city committed so far to planning a Willamette treatment plant, which also would serve a proposed women's prison in Wilsonville. Tualatin, Sherwood and Wilsonville are considering it.

Hanging on the outcome of the debate are the region's residents, who drink the water the cities provide and trust it will be healthful and safe. For example, Tigard will pay most of the \$162,000 cost of a public relations campaign to convince people that the Willamette water can be made safe, despite a

long history of pollution.

"With purification and filtration, the citizens of Tigard and surrounding communities will be supplied the highest-quality drinking water available in the region and in the state," Mayor Jim Nicoli said.

A Willamette project does not depend on approval by the water consortium, which is made up of elected officials from across the region. However, Wednesday's meeting will be the first significant public airing of the project.

"I would like some public discussion of these issues," Sten said. "I think the board is an obvious place to start. It's going to be fascinating."

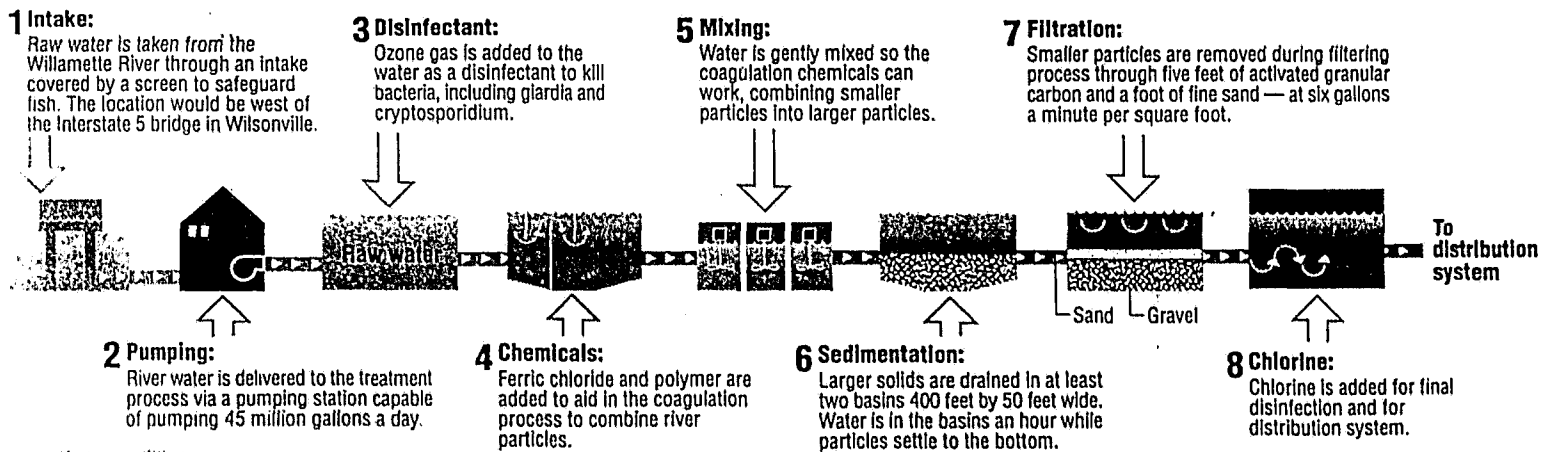
Sten warned that if a large number of suburbs peel away from the Bull Run system, it could force Portland to cut some other suburbs off — even if they still want Bull Run — because there might not be enough customers left to pay for future expansion in the Bull Run watershed.

"That's not a threat," Sten said. "That is not a choice I'm making. I'm just putting it on the table." He said communities east of Portland, including Gresham, wouldn't be cut off.

Located in the Mount Hood National For-

**Please turn to
WATER, Page 10**

Proposed Willamette River water treatment plant



By Gregory Watson

Water: Bull Run option could weaken Willamette argument

■ Continued from Page B1.

est about 35 miles east of Portland, the Bull Run watershed is considered one of the purest water sources of any city. Portland sells about 40 percent of the water to other communities.

The significance of Sten's guarantee that Bull Run water could be available for most of the next two decades is that it could undermine arguments of Willamette advocates that some cities face water shortages and that Portland can't guarantee to meet their needs.

A proposal to raise the height of the second of the two Bull Run dams by about 12 feet is an old proposal that the city is taking a new look at because of others' interest in the Willamette.

Sten said he is discussing his proposals with other officials in the region, including Tigard and Tualatin, both of which get most of their water from the Bull Run system.

"It's really their decision," Sten said of a Willamette project. "But if they would like to pursue the Bull Run, I think we have to come up with another option. I have got no worries over the next 10 to 20 years in being able to supply them."

Officials in Tigard and Tualatin voiced interest in hearing more from Sten.

"That meeting left the door open," said Ed Wegner, Tigard public works director. "We don't have to build that plant, but we are still studying it."

But Wegner said time is running out because Tigard needs a new source within the next five years or must face serious water shortages. He also said a new pipeline from Portland might be needed because the current pipeline to the southwest suburbs is nearing capacity.

"He can't make those decisions overnight," Wegner said of Sten's proposals. "But we need to start making them. For some of us, it's almost too late. We're already behind the eight ball."

He predicted that Tigard will still find the Willamette option "makes the most sense."

Tualatin Mayor Lou Ogden said Sten's presentation "was new information to me" and gives Tualatin another option to consider before it reaches the capacity of its current Bull Run supply sometime within the next decade.

"Certainly, if everything else is equal, if cost is equal, if availability of supply is equal, if predictability is equal, all those things are equal, we

WATER MEETING

Meetings of the Regional Water Providers Consortium Board are open to the public. The meeting to discuss the Willamette River water treatment project will be from 7 to 9 p.m. Wednesday in the Metro Building at 600 N.E. Grand Ave. in Portland.

would go for the Bull Run," Ogden said.

But he also said he doesn't have "a particular aversion to looking at the Willamette as a source" and thinks it can be made safe.

Most of the contracts Portland has to supply water to the suburbs will expire by 2005 and would have to be renegotiated.

With respect to its future costs, Portland faces the possibility that the Environmental Protection Agency could require all cities to have filtration plants, no matter how pure their water supply is. "If we lose customers and have to build a filtration plant, it's not a great scenario for us," Sten said.

Even without an EPA requirement, the city has been considering a treatment plant to filter out sediment from water near the bottom of the two major reservoirs to make more water available.

Sten said the estimated cost of a Bull Run project, between \$120 million and \$150 million, compares favorably with the cost of a Willamette water treatment plant project — considering Bull Run would provide much more water.

Planners estimate an \$80 million to \$90 million cost for a treatment plant that produces 40 million gallons of water a day, including water pipelines, pumping plant and a river intake. Tigard's share would be about \$40 million. If Tigard is alone, it may opt for a smaller plant of 20 million gallons.

The cutoff date for the initial commitment to begin the final design and planning of a treatment plant is March 1, but planners said others could join as late as early next year. Although Wilsonville has declared a moratorium on new development projects because of a water shortage, it plans to submit the various water options to a public vote later this year.

Much of the \$10 million that the Department of Corrections has allocated to develop a water source for the prison could be used by Tigard to build the plant, project planners said. But Wegner said Tigard was committed to planning the project

before the prison money became available.

Jesse Lowman, director of the Tualatin Valley Water District, said that although the Willamette plant would serve just a few communities initially, major components — the river intake, pumping plant and pipelines — might be built for much larger use in the event the Willamette is picked as a future source for the entire region.

He said the district, which is organizing the project, would pay the difference between facilities that would serve Tigard and the facilities that would serve a large area.

Lowman said it makes sense to make the investment in larger facilities now rather than be forced to disrupt the river a second time and rebuild the pipeline and other facilities if a larger use develops.

The regional consortium has been considering three options for a new long-term water source for the region: the Willamette, a third dam in the Bull Run watershed, and a treatment plant on the Columbia River, although interest in the Columbia has waned.

A report prepared for the consortium meeting stressed that the Willamette project is intended to meet local needs and not circumvent regional planning.

"There are no plans to oversize the treatment plant to provide excess capacity to other communities that do not have immediate needs for additional supply," the report said.

The report said that residents of the cities "will have the final say over whether this treatment plant will be built," probably through bond issue elections.