

# Appendix C

## CONVENTIONAL SUPPLY OPTIONS

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This appendix provides background information that supplements the information in Section 9, Conventional Supply Options.

### Supply Option Concept Level Estimate Example

Following is a total capital cost estimate for a 10 million gallon per day (mgd) capacity water treatment plant that would treat a typical surface water source in the greater King County area. The basic assumptions used in developing this estimate were as follows:

- The source of supply would be surface water in King County.
- An intake structure within about 500 feet of the plant would be needed.
- The plant would be a conventional filtration facility with a firm maximum day capacity of 10 mgd. The typical average day production rate would be 5 mgd.
- Treated water from the plant would be pumped into a transmission line and conveyed about 1 mile to an existing storage reservoir. The transmission line would be included in the project costs, but not the reservoir.
- The plant would not be “oversized” to accommodate a significant increase in capacity.

This is a concept level estimate based on broad assumptions and assumes that there are no unusual site development or treatment requirements. Hence, this estimate should be considered representative of actual anticipated costs to no less than +/- 30%.

### Basis of the Water Treatment Plant Construction Cost Estimate

The treatment plant would be designed to meet the requirements of the Enhanced Surface Water Treatment Rule and would be centered around a conventional rapid sand filtration process with post-chlorination and provisions for adding enhanced primary disinfection (e.g., ozone). It was assumed that no other contaminants would be present in the raw water other than those typically found in Northwest surface water sources. It was also assumed that the concept plant would also have backwash water basins, a UV disinfection system, a clearwell, a pH adjustment system, sludge dewatering, and an auxiliary power system.

To develop the estimate, construction cost data from two water treatment plant cost studies was used rather than developing costs of individual plant components using assumptions that may vary significantly for different sites and source waters.

The first cost study used was “New Surface Water Treatment Plant Construction Cost Data” prepared by the AWWA Water Treatment Design and Construction Committee in 1992. This study used data from 38 new surface water treatment plants constructed since 1980, ranging in size from 1 to 45 mgd. At least one-half of these plants had the following “basic facilities” included in its cost: an intake, raw water screening, raw water pumping, rapid mixing, flocculation, sedimentation, rapid sand filtration, finished water storage, high service pumping, and an operations/chemical building. Many of these plants had additional facilities such as sludge dewatering, sludge lagoons, ozone, auxiliary power, etc., while some did not have some of the “basic facilities”. Overall, this data pool can be considered to be quite representative of treatment plant construction costs when adjusted to the current ENR Construction Cost Index (CCI). The resulting log regression equation based on the data is:

■ Average Plant Cost (\$ millions) = 1.51 x capacity (mgd)<sup>0.859</sup>

This study was done in March 1992 when the 20-city CCI was 4900. Thus, using this equation and adjusting to a current CCI for Seattle of 7150, a 10 mgd plant would have an anticipated construction cost about \$15.9 million, or \$1.59 per gallon of plant capacity. However, it should be noted that this equation is based on a data pool where many of the plants had “extra” facilities in addition to the “basic facilities” and therefore may be somewhat conservative.

The AWWA study data also show that the costs for a 10 mgd facility would fall within a range of about \$0.7 to \$1.8 per gallon with a 90% confidence limit in March 1992. Escalating this range to the current Seattle CCI of 7150 results in 90% confidence limits of about \$1.02 to \$2.63 per gallon.

The second cost study used was a short study on water treatment plant construction costs prepared by R. W. Beck in March 1998. The Beck study looked at actual construction costs, in terms of dollars per gallon, based on eight recently constructed plants ranging in size from 2 to 150 mgd capacity. Six of the plants were located in the western U.S. The types of treatment processes and features included in these plants were not identified. Of the eight plants, the cost of one was from an engineer’s estimate prior to construction and a second one was a bid cost; the others were all based on final construction costs. Similar to the AWWA study, it was found that a log regression model best fit the actual cost data. Based on this study, a 10 mgd plant would have a predicted average construction cost of about \$1.30 per gallon capacity (in 1998 dollars, March 1998 Seattle CCI of about 6650). Adjusting to 2000 based on the current Seattle CCI of 7150, the predicted average construction cost would be about \$1.40 per gallon capacity.

Based on the findings of the two cost studies described above, a reasonable construction cost factor for a new surface water treatment plant is \$1.50 per gallon capacity. This assumes that our concept treatment plant would not have a significant amount of “extras” or be “oversized” to accommodate potential expansions of capacity.

### ***Basis of the Transmission Line Construction Cost Estimate***

The construction cost estimate for the finished water pipeline was based on an assumed cost of \$5.00 per inch diameter per lineal foot. It was assumed that a 30-inch diameter pipe would be needed to convey a flow rate of 10 mgd.

### ***Assumptions for Other Project Costs***

To develop an estimate of total capital costs, the following assumptions were used for project costs in addition to construction costs.

- *Construction Contingency:* A contingency allowance was assumed based on 15% of the total estimated construction cost.
- *Land Acquisition:* Assumed a purchase of up to 10 acres at a cost of up to \$20,000 per acre. Thus, provide an allowance of \$200,000 for land.
- *Engineering:* Assumed engineering fees at 20% of the total estimated construction cost.
- *Permits:* Assumed an allowance for permit fees at 5% of the total estimated construction cost.
- *Administrative and Legal:* Assumed an allowance for costs associated with administration and legal matters at 5% of the total estimated construction cost.
- *Environmental Mitigation:* Assumed an allowance for environmental mitigation, which may include additional planning, engineering, permitting, land acquisition, construction, and legal costs, of 25% of the capital costs.
- *Operation and Maintenance Cost:* Annual plant O&M costs were based on an annual average day flow rate (5 mgd) and include power, chemicals, materials, and labor costs. The estimated total O&M cost is based on the assumed cost of \$0.50 per 1000 gallons water production.

## Future Local Supply Options for Utilities with Predicted Shortfalls

Provided below is a summary of anticipated shortfalls and a discussion of each utility's plans to alleviate the shortfall using local or regional supply options for the utilities that were identified in Section 6 as potentially needing additional supplies by 2020.

### King County Utilities With 2020 Demand Exceeding Existing Supplies

#### Ames Lake Water Association

Ames Lake Water Association serves a population of approximately 2,500, and is projected to grow by 70 percent from 2000 to 2020. It has its own groundwater source of supply. The primary constraint on water supply is water rights. Annual average water rights are 0.33 mgd. *The utility's demand forecast projects that this annual water right will be exceeded beginning in 2013.* Instantaneous water rights vary throughout the year. They are 0.49 mgd in all months except July and August. The July and August instantaneous water rights are 0.79 mgd and 0.58 mgd respectively. However, additional conditions and constraints exist on the July and August water rights. If the full right of 0.79 mgd is not used in July, then the August right is increased to 0.68 mgd. If the full water right is used in July, then Ames Lake must mitigate back to Padsen Creek 0.022 mgd (15 gpm) during July and 0.036 mgd (25 gpm) from August through October. If they do not use the full right in July, but use their full water right in August, they must mitigate back to Padsen Creek 0.036 mgd (25 gpm) from August through October. The August water right appears to be the most limiting constraint on their peak day demand. However, the utility's peak day demand forecast indicates that demand is not expected to exceed the August instantaneous water right until after 2020.

Ames Lake is currently pursuing new wholesale purchases and additional water rights in order to meet their rising demands and avoid future shortfalls in supply. Ames Lake is one of several utilities that are discussing with Seattle Public Utilities (SPU) the possibility of purchasing water from them. The new source of supply would be from Seattle's Tolt Pipeline, however water would be delivered through an intertie with Sammamish Plateau. It is possible that a contract for wholesale water purchases will be finalized in 2001. The quantities of annual and instantaneous supply are not yet known. Ames Lake has also continued pursuing a new water right that would provide them with an additional 0.09 mgd of annual supply. It is estimated that this might be granted by 2004, but granting of a new water right is dependent upon a number of factors still to be evaluated by the Department of Ecology (Ecology).

### **Black Diamond Water Department**

Black Diamond Water Department serves a population of approximately 2,500 and is projected to grow nearly 20 percent by 2020. It has its own source of supply from springs. Black Diamond cannot utilize their total water rights at this time due to constraints of their pumping capacity. However, despite planned improvements to utilize their full pumping capacity they still expect a shortfall in their available supply. The City's water rights to this source are limited by an average annual supply of 0.49 mgd. The springs are capable of producing far more than this amount (estimated 19 mgd) and the City peak flow rate (Qi) allowed by their water rights, is for 5.17 mgd. Although the available water is substantial, and the peak flow rate is significantly more than what the City can utilize, the annual withdrawal rate limits the amount of growth the City can serve. Based on current growth projections, the City's projected demands would exceed their available supply between 2006 and 2007.

Black Diamond is looking at interties, wholesale purchases, new water rights, and transfer of existing water rights to meet their future water supply needs. Additional supply from a new water right or transfer of an existing water right is unlikely due to instream flow requirements. Black Diamond has been talking with a number of other water purveyors in the region to establish additional sources of supply. An intertie with Covington is one possibility, as well as a tap off of Tacoma's Second Supply Project. There has not yet been any contract established. Within the next two years, they also plan to make improvements to their pumps in order to fully utilize their existing water rights.

### **Covington Water District**

Covington Water District has its own groundwater sources, and also purchases water from Auburn on an interruptible basis. It has a contract in place to purchase additional water from Seattle on an emergency basis. The District serves a population of approximately 39,000 and is projected to grow 17 percent by 2020. Based on the District's forecasts, average day demand is projected to exceed Covington's annual water rights by 2011. However purchased water is expected to be adequate to meet average day demand after this date and through at least 2020. *Maximum day demand already exceeds Covington's instantaneous water rights. Covington purchases water to make up the difference in meeting maximum day demand. Covington's maximum day demand is projected to exceed constrained available supply around 2003. Additional purchases from the Tacoma Second Supply Project will provide enough maximum day supply through 2015 (2012 under constrained conditions), before another potential shortfall could occur.*

Covington plans to meet near-term shortfalls in their maximum day and average day demands through the Tacoma-Seattle Intertie and Tacoma Second Supply Project, both of which Covington is a partner utility in. Tacoma's Second Supply Project is expected to be completed within the next five years and would provide Covington with enough water to meet their forecast average day demands through 2020 and peak day demands through 2015. Additional future supply options have not yet been identified.

### **City of Issaquah**

The City of Issaquah supplies its demands through use of its own groundwater supply as well as purchased water from the City of Bellevue. Issaquah has two purchase agreements with the City of Bellevue. However, they are currently unable to utilize the water available from their second contract with Bellevue, due to a limited infrastructure capacity. Under their existing system Issaquah would have a shortfall by 2003. During the next two years Issaquah will complete improvements to their infrastructure that will allow them to fully utilize their contract purchase amounts.

*However, despite a new transmission main to supply their existing contracted purchase quantities, Issaquah still has a projected shortfall in 2007 for their maximum day demands. Additionally, forecast average day demands are expected to exceed their available supply by 2010. Issaquah is seeking additional regional water supplies to meet average and maximum day demands beyond 2007.*

### **Kent Water Department**

Kent serves a population of approximately 50,000 with its own groundwater supply. The population served is projected to grow 31 percent by 2020. Kent's water rights of 25.89 mgd (annual) and 40.25 mgd (instantaneous) are adequate to meet projected demands through 2020. However, peak day production is limited, due to potential hydraulic continuity between the aquifer serving Kent and nearby surface waters that have instream flow requirements. *This constraint on pumping limits Kent's sustainable peak capacity to 17 mgd. As a result, Kent's peak day demand exceeds the resource constraint in 2000.*

Kent is pursuing a number of short-term and long-term future supply options to help meet their forecast demands and overcome resource constraints on their sources of supply. An impoundment storage facility is expected to supply sufficient resources to meet future peak day demands. In the first phase, expected to be complete in 2011, an additional 7 mgd of peak day supply capacity will be added. At the completion of Phase 2 in 2020, 4 mgd will be added. The total storage capacity of the impoundment facility is 2,500 acre-feet, which will provide significantly more average day supply capacity as well. The exact quantities that can be provided on an annual average basis has not yet been determined, however the City of Kent believes it will provide plenty of supply to meet their forecasted demands through 2020. In the near term, Kent is also pursuing a new water right and is a co-owning partner of the Tacoma-Seattle Intertie and Tacoma Second Supply Project, which will provide water to meet immediate shortfalls.

### **King County Water District No. 111**

King County Water District No. 111 has its own groundwater source, and also purchases water from Auburn. The District serves a population of approximately 15,000, and is

projected to grow 42 percent by 2020. Annual water rights were reported to be 1.97 mgd, and instantaneous water rights were reported to be 2.77 mgd. The District is currently limited to purchases of 2.5 mgd, on both an average day and peak day basis. The District's forecasts indicate it has adequate supply to meet average day demands through 2020. *However, even with purchased water, the District's peak day demand is projected to exceed available supply by 2012.* In addition, water purchased from Auburn is on an "interruptible" basis.

Near term plans by the District to increase their sources of supply include aquifer recharge, new purchases, and improvements to existing infrastructure. The improvements to existing infrastructure include a new pump, which would supply approximately 0.14 mgd of new supply. Recharge to a Lakehaven aquifer via Auburn is another potential solution to meeting peak day demands within the District. The District would use winter surplus water to recharge the aquifer, providing enough water for three months of peaking use. A more long-term solution to supply, which the District feels more certain of, is establishing a purchase agreement with SPU. This would likely not occur until 2012, however an additional 2 mgd of annual average and maximum day demand could potentially be provided through wholesale purchases.

### **City of North Bend**

North Bend supplies all of its water demands through its own groundwater source. The population served by the City's water system is approximately 4,900, and is projected to grow 41 percent by 2020. *Average day demand already exceeds the City's annual water rights of 0.30 mgd.* Peak day demand forecasts by North Bend remain below instantaneous water rights of 3.23 mgd beyond 2020. No other constraints were reported for this system.

The City is pursuing new water rights and wholesale purchases to help meet potential shortfalls in their average day demands. They have applied for an additional water right for Mount Si Springs that would increase their annual water right limits to their instantaneous right. A change in their water right, dependent on an evaluation and decision by Ecology, would increase their annual allowable water right by 2.93 mgd, for a total of 3.23 mgd. Another alternative supply option would be to purchase water from an adjacent purveyor. The City explored the possibility of purchasing water from its neighboring city, Snoqualmie. The Department of Ecology, however, did not accept that alternative as a viable option. Currently, North Bend is working with Sallal Water District and the City of Seattle to secure water for the next twenty years.

### **City of Pacific**

The City of Pacific water system serves a population of approximately 6,500. The population served is projected to grow 38 percent by 2020. Pacific has its own groundwater source of supply, and also delivers water to Webstone Water District in Pierce County. The City has sufficient average day supply to meet demands beyond 2020. *Based on the Outlook demand forecast, Pacific's peak day demand exceeds instantaneous water rights in 2000.* Pacific has an emergency intertie with the City of Auburn, but is not a regular wholesale customer.

The City is pursuing a number of future supply options to meet their existing and future demands. They have talked to a number of water suppliers in an attempt to purchase water. Pacific has not yet been able to enter into a contract with any of the water purveyors they have spoken with. In addition to water purchases, they are also investigating the potential for developing a new storage facility within their water service area. This would provide them with extra capacity to serve both average and peak day demands.

### **Sallal Water Association**

Sallal Water Association serves a population of approximately 3,800 and is projected to grow by 35 percent between 2000 and 2020. It has its own groundwater source. Instantaneous water rights appear adequate to meet projected peak day demand beyond 2020. *However, average day demand is projected to exceed the average annual water rights of 0.71 mgd, beginning in 2008.* No other constraints were reported by the utility.

### **Sammamish Plateau Water and Sewer District**

Sammamish Plateau has its own groundwater source, and serves a population of approximately 38,000. It is projected to grow by 56% percent from 2000 to 2020. The District has two hydraulically separate service areas, the Plateau Zone and the Cascade View Zone. Each zone has its own wells, water rights, and demands.

The Plateau Zone has an average day supply constraint of 6.15 mgd and a maximum day supply constraint of 14.18 mgd. *Average day demands and maximum day demands are expected to exceed the available supply in 2007 and 2002 respectively.*

The Cascade View Zone has an available average day supply of 0.41 mgd, which is sufficient to meet demands beyond 2020. *However, maximum day demands are expected to exceed the available peak day supply of 0.72 mgd around 2008.*

The District has four potential future supply options to provide additional supply to meet expected shortfalls. They include (1) continuing to pursue additional groundwater rights and groundwater recharge, (2) connecting to the regional surface water system south of the District (Issaquah pipeline), blending surface water and groundwater (3) connecting to the regional surface water system south of the District, but keeping a portion of the service area isolated from the surface water, and (4) connecting to the regional surface water system to the north of the District (Tolt Pipeline 2).

## **Pierce County Utilities with 2020 Demand Exceeding Existing Supplies**

### **Bonney Lake Water Department**

The City of Bonney Lake serves a population of approximately 23,200, using its own groundwater source. Growth from 2000 to 2020 is projected to be 46 percent. Annual water rights of 5.9 mgd appear sufficient to meet projected average day demand through 2020. *However, peak day demand projections indicate the instantaneous water right of 8.35 mgd will be exceeded in 2006. The City's well capacity is also reported to be 8.35 mgd, and will be exceeded in the same year.* Information regarding Bonney Lake's future potential supply options was unavailable at the time this report was prepared.

### **Buckley Water**

The City of Buckley serves water to a population of approximately 4,500. This population is expected to grow by 22 percent from 2000 to 2020. Buckley has its own groundwater source. *Based on demand projections provided by Buckley, both average day demand and peak day demand currently exceed the City's water rights.* No other constraints were reported.

Future supply options that Buckley is pursuing, include new water rights, changes in existing water rights, and wholesale purchases. The City is applying for new water rights on the White River and South Prairie Creek. Water rights on the White River would have summer constraints due to instream flow requirements, but a right on this river would improve the City's annual supply. A related option would be to enter into a coalition with Puget Sound Energy and the Lake Tapps community to purchase water rights on the White River. Another alternative is to convert an existing irrigation right to a domestic water right. The additional available supply from such a change would be 0.357 mgd annually and 1.96 mgd instantaneous. Buckley is also in discussions with Ecology to clarify their existing water rights. The City has interpreted a larger instantaneous right than what Ecology has understood the City to have. This issue is still being discussed and has not yet been resolved. Another potential solution is to purchase water from Tacoma. However, Buckley would pursue this option only if all other alternatives failed to provide additional supply to meet their future demands.

### **Eatonville Water Department**

The City of Eatonville serves a population of approximately 2,100, using its own surface and groundwater sources. It is projected to grow by approximately four percent from 2000 to 2020. *Demand forecasts provided by the utility indicate that annual water rights will be exceeded in 2010, and instantaneous water rights will be exceeded in 2011.* No other constraints were reported.

Eatonville plans to apply for additional water rights to meet any shortfalls beyond 2010. It has not yet been determined when Eatonville would submit an application to Ecology and what quantities might be available, if Ecology grants additional water rights.

### **Firgrove Mutual, Inc.**

Firgrove Mutual serves water to a population of approximately 15,600. This population is projected to grow by 48 percent from 2000 to 2020. Firgrove has its own groundwater source, and would like to fully utilize this source and avoid purchasing water. However, it is currently purchasing water from Tacoma Water to supplement its supply.

*In 2002, Firgrove's peak day demand is projected to exceed its instantaneous water rights as interpreted by Ecology. Average annual demand is nearly at the level of its annual water rights and is projected to exceed this level in 2000.* Firgrove believes its true water rights are higher and is negotiating to allow for higher production levels. Besides water rights, no other constraints were reported by the utility.

In addition to discussions with Ecology to clarify administration of their water rights, Firgrove is also considering applying for new water rights and has the option of wholesale purchases and interties with Tacoma to meet future demands. Although water is available from Tacoma through three interties, Firgrove would prefer to meet future demands through administrative corrections to their existing rights and through new water rights.

### **Fruitland Mutual Water Company**

Fruitland Mutual produces water from its own groundwater source, to serve a population of approximately 11,000. The population served is projected to grow by 30 percent from 2000 to 2020. *Average day demand is projected to exceed annual water rights by 2007. Peak day*

*demand is projected to exceed well capacity in 2011. Even in the absence of this constraint, instantaneous water rights would be exceeded by 2012.*

Fruitland is pursuing new water rights and interties to meet future demands. They plan to submit an application for a new water right in 2001, but it is not certain when, or if, a water right certificate will be granted. Fruitland has also been pursuing interties with several adjacent purveyors. The success of the intertie option is dependent upon the determination made by Ecology. Another possibility is to try to purchase water from Tacoma. However, Fruitland considers this a less desirable alternative, to be pursued only in the event that other alternatives are not successful.

### **Herron Maintenance Water System**

Herron Maintenance serves water to approximately 340 households, from its own groundwater source. Average annual water rights are 0.158 mgd, and instantaneous water rights are 0.318 mgd. *Based on demand projections developed during Phase I of the Outlook, Herron may be exceeding these water rights.* It should be noted that for small systems such as Herron, the Outlook demand projections are less accurate and may not appropriately describe actual conditions. Insufficient data was available to verify Herron's demand projections.

### **Peacock Hill**

Peacock Hill serves water to a population of approximately 2,400. This population is projected to grow by 61 percent from 2000 to 2020. Average annual water rights associated with its groundwater source are 0.44 mgd, while instantaneous water rights are 2.02 mgd. No other supply constraints were reported. *Based on the Outlook demand forecast, the annual water right will be exceeded in 2016.* The instantaneous water right appears sufficient to meet peak day demand beyond 2020.

Peacock Hill submitted an application for a change in one of their existing water rights from supplemental to primary. The application was submitted in 1998 and is still pending. If it is approved, it will provide Peacock Hill with an additional 0.20 mgd of primary water rights to meet their annual average demands, which would be sufficient to meet their projected 2020 demands.

### **Southeast Tacoma Mutual Water Company**

Southeast Tacoma Mutual provides water to a population of approximately 12,300, from its own groundwater sources. This population is projected to grow by 35 percent from 2000 to 2020. Southeast Tacoma reported annual water rights totaling 1.70 mgd, and instantaneous water rights of 9.63 mgd. Its well capacity was reported as 7.03 mgd. Based on demand forecasts provided by the utility, water rights and well capacity are sufficient to meet peak day demands beyond 2020. *However, annual water rights will be exceeded by average day demand, beginning in 2002.*

Southeast Tacoma drilled two new wells to determine if a new source of supply could be developed within their service area. However, both wells proved unreliable in respect to water quality and water production. As a result, Southeast Tacoma has been working over the past year with the City of Tacoma to merge with their water system. Southeast Tacoma expects the merger to be finalized by 2001.

### Southwood Water System

Southwood Water serves a population of approximately 14,800 people, from its own wells. Growth from 2000 to 2020 is projected to be 40 percent. Southwood has annual water rights of 1.81 mgd and instantaneous water rights of 8.40 mgd. The utility reported its well capacity as 6.5 mgd. Based on the Outlook demand projections, Southwood has adequate instantaneous water rights and infrastructure capacity to meet its needs beyond 2020. *However, it is projected that average day demand will exceed annual water rights, beginning in 2007.*

Southwood has realized a potential shortfall in their ability to provide enough water for future demands. They have been pursuing a number of options to enhance their current supply. They are considering new water rights and are engaged in discussions with adjacent purveyors to try and establish interties.

### Spanaway Water Company

Spanaway Water delivers water to over 19,000 people. Based on forecasts provided by the utility, projected population growth is 88 to 126 percent from 2000 to 2020. Spanaway has its own groundwater sources. Average annual water rights are reported to be 3.63 mgd, while instantaneous water rights are 14.41 mgd. Spanaway reported a total well capacity of 9.28 mgd. *Based on demand forecasts provided by the utility, Spanaway's average day demand will exceed annual water rights in 2007. Peak day demand will exceed well capacity in 2013.* If existing instantaneous water rights can be fully utilized, instantaneous water rights will be adequate to meet peak day needs beyond 2020.

Spanaway is pursuing new water rights and transfers in their existing rights to meet their future demands. They have two new water right applications to Ecology. One application is for an increased withdrawal from their existing Well Number 5 site. Full utilization of the redrilled Well Number 5 would require a transfer of part of their existing rights from Well 7 to Well 5 and new additional annual water rights. Total production capacity with the enlarged Well Number 5 would increase to 10.4 mgd. The second application is for a new point of withdrawal with additional Qa and Qi.

Spanaway is also pursuing possible interties with Lakewood and Parkland that would provide new wholesale water. Applications to change the place of use for these three water purveyors' sources have been submitted to Ecology. These interties are parts of the sub-regional water system embodied in the Pierce County Coordinated Water System and the ongoing planning of the Water Cooperative of Pierce County.

### Summit Water and Supply Company

Summit Water serves a population of approximately 13,600, which is projected to grow by 26 percent from 2000 to 2020. Summit Water has its own groundwater source. Annual water rights are reported to be 1.90 mgd, while instantaneous water rights are 5.47 mgd. Summit Water reported a well capacity of 4.5 mgd.

*Summit Water's demand forecast indicates that average day demand will exceed annual water rights beginning in 2013. Peak day demand will exceed well capacity in the same year.* However, instantaneous water rights are adequate to meet projected demand beyond 2020.

There are a number of potential interties that Summit is pursuing to help them meet their future supply needs. Two possibilities are interties with Lakewood or Parkland that would provide new wholesale water. Although Summit also has an existing intertie with Southeast

Tacoma and a booster pump in place with that intertie that would facilitate the transfer of water to Summit, Summit does not currently utilize their full pumping capacity for their groundwater rights. They began the process of applying for a transfer of their supplemental rights to primary, however Ecology closed the Puyallup Basin, which those rights apply to, stopping any further water right development at this time.

### **City of Sumner**

The City of Sumner delivers water to a population of approximately 9,600, using its own groundwater source. The population served is projected to grow by 29 percent from 2000 to 2020. Sumner reported annual water rights of 2.19 mgd, and instantaneous water rights of 5.77 mgd. No other supply constraints were reported. *Based on the Outlook demand forecast, both annual and instantaneous water rights will be exceeded in 2005.* Information regarding Sumner's future potential supply options was unavailable at the time this report was prepared.

### **City of Tacoma**

The City of Tacoma provides water for approximately 268,000 people. Tacoma supplies all of its own water from the Green River and from the South Tacoma wells. The total water rights for both its surface and groundwater sources comprise annual rights of 146 mgd and instantaneous water rights of 247 mgd. Instream flow constraints limit the available average day supply to 108 mgd. The City's water rights and well capacity limit the available peak day supply to 132 mgd. *Based on Tacoma's demand forecasts, they will exceed their peak day available supply in 2013.*

Tacoma is in the process of developing the Green River Second Supply Project which would provide additional water to Tacoma, Seattle, and South King County Utilities. Tacoma has obtained an additional water right to withdraw an additional peak flow of 100 cfs (65 mgd) from the Green River. With the additional supply provided by the Green River Second Supply Project, Tacoma would have sufficient water to meet peak day demands through 2020.

## **Snohomish County Utilities with 2020 Demand Exceeding Existing Supplies**

### **City of Gold Bar**

The City of Gold Bar serves water to a population of approximately 2,300, using its own groundwater and surface water sources. The population served is projected to grow by 58 percent from 2000 to 2020. Gold Bar reported annual water rights of 0.30 mgd and instantaneous water rights of 1.10 mgd. Its well capacity was reported to be 0.24 mgd. *Based on demand forecasts provided by Gold Bar, its peak day demand currently exceeds well capacity.* However, instantaneous water rights are sufficient to meet projected demand beyond 2020. *Projected average day demand will exceed annual water rights, beginning in 2015.* Information regarding Gold Bar's future potential supply options was unavailable at the time this report was prepared.