EXHIBIT NO. ___(PKW-7)
DOCKET NO. UE-09___/UG-09___
2009 PSE GENERAL RATE CASE
WITNESS: PAUL K. WETHERBEE

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-09____** **Docket No. UG-09____**

SIXTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF PAUL K. WETHERBEE ON BEHALF OF PUGET SOUND ENERGY, INC.

MAY 8, 2009

Lake Tapps Water Valuation Research

121 Grand Avenue, Suite 222
Laramie, WY 82070

Lake Tapps Water Valuation Research

Prepared for
Puget Sound Energy
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By

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May 24, 2004

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Memorandum

To: Joel Molander, Puget Sound Energy

Sam Osborne, Puget Sound Energy

CC: Kyle Branum & Bruce Dick, Perkins Coie

From: Clay Landry

Date: May 24, 2004

Subject: Summary of Valuation Research for Lake Tapps Water Right

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WestWater Research was engaged to provide pricing and valuation services Puget Sound Energy during the sale and negotiations of water rights held in Lake Tapps. The following provides a summary of the research and information that has been provided by WestWater Research.

1. Market Consultation Report – August 5, 2003: The purpose of this market consultation report is to provide Puget Sound Energy (PSE) with a review of recent transactions in the Puget Sound Region and to provide market intelligence on terms and prices. Twelve transactions were identified and analyzed within the Puget Sound region. With the exclusion of one distressed asset sale, the range of market values for the eleven remaining transactions is $535 to $3,337 per acre-foot with a median of $900 per acre-foot and average of $1,286 per acre-foot. This range of values provides a broad valuation overview of the Puget Sound Energy water right.

2. Alternative Supply Valuation Analysis – October 3, 2003: The purpose of this analysis is to provide a comparison of costs for alternative water supply options within the Puget Sound Region. This review provides the basis for a development cost approach to valuing the Lake Tapps water right. The development cost approach is one of four primary methods used to estimate the fair market value of water rights.

   This analysis reviews the cost of alternative water supplies within the Puget Sound Region. Project costs associated with new source development and regional wholesale water rates were reviewed.

   - The average unit price for alternative water supply projects within the Puget Sound Region was $4,516 per acre-foot.
   - The capitalized value of wholesale water rates within the region ranged from $3,494 to $6,779 per acre-foot.
   - The estimated capital costs for developing the Lake Tapps water right to serve as a regional water supply range from $2,723 to $5,075 per acre-foot.

3. Cascade Water Alliance – Puget Sound Region Water Valuation Presentation October 27, 2003: This presentation provided a summary of the valuation analysis conducted by WestWater Research. The information was presented to Cascade Water Alliance on

October 27, 2003. The purpose of the presentation was to provide the Alliance with information on recent water sales and cost comparison to water supply alternatives.

4. CWA Water Pricing Model Analysis - April 8, 2004: WestWater Research developed a rate model based on the preliminary model provided by Puget Sound Energy, the original printed documentation of CWA's model, and revised assumptions of CWA's model. The model developed by WestWater provides a flexible mechanism for evaluating alternative payment structures for the Lake Tapps water right. WestWater Research submits this analysis as a preliminary review of the costs to CWA per ccf under various scenarios. In general, these revised results suggest the following:

    - The average rates paid by CWA customers between 2004 and 2050 would be lower on average under a longer payment structure.
    - CWA could reduce its average customer rates between 2004 and 2050 significantly by purchasing and developing the Lake Tapps water right, especially if SPU is required to develop the Green River Second Supply project.
    - The assumptions which determine the SPU rate have many uncertainties. Most likely, the SPU rate charge to CWA will increase. With a rate increase, the average costs to CWA will also increase, expanding the rate disparity between SPU supply and Lake Tapps water right supply.

5. RW Beck Information Request – May 6, 2004: A memo was prepared in response to the informational request submitted by RW Beck regarding the "Market Valuation of Water Rights in Western Washington" that was presented to CWA on October 27, 2003.

6. Market Valuation of Water Rights in Western Washington Presentation – May 6, 2004: This presentation was provided to RW Beck in response to the information request submitted on February 20, 2004. The presentation is similar to the one provided to CWA on October 27, 2003. Additional information was provided on transactions in other market areas.

WestWater Research LLC
121 Grand Avenue, Suite 222
Laramie, WY 82070

Privileged and Confidential Information

DRAFT REPORT

Memorandum

To: Bruce Dick, Perkins Coie

From: Clay Landry

Date: August 5, 2003

Re: Water Market Consultation Report for Western Washington

Purpose of the Market Consultation Report

The purpose of this market consultation report is to provide Puget Sound Energy (PSE) with a review of recent transactions in the Puget Sound Region and to provide market intelligence on terms and prices. This report is intended for internal use only and does not provide a complete analysis of the fair market value of the Lake Tapps municipal water right held by Puget Sound Energy.

As indicated in the project proposal submitted by WestWater Research, this market consultation report will serve as a basis for a detailed water right appraisal. The water right appraisal will employ a comparable sales valuation approach and require a detailed review the subject water right as well as recommend a market price and premium adjustments based on the market, legal and physical characteristics of the Lake Tapps water right.

Market Analysis Approach

This market consultation report provides Puget Sound Energy with information on market prices and water right sales that are relevant to the Lake Tapps municipal water right. Specific focus is also given to water right transactions located in the Puget Sound. Due to the private nature of water sales, many water transactions often go unrecorded. Furthermore, the market for water rights separate from land in Western Washington is largely undeveloped. Consequently, there are a limited number of comparable sales. Water right sales throughout Washington and other

comparable states are reviewed to supplement the limited market information from the Puget Sound region.

Transaction and sales information was researched and verified in order to reconcile and compare prices. Sources used to compile transaction and sales information include WestWater Research files, local and state attorneys specializing in water, real estate brokers, buyers, sellers, Department of Ecology officials, and state, county, and city records.

Multiple valuation techniques are recommended when market information is limited. Relying only on comparable sales from thinly traded markets may result in an inaccurate assessment of fair market value due to limited pricing information.

Summary of Lake Tapps Municipal Water Right

Puget Sound Energy owns and operates the White River Hydroelectric Project. Puget Sound Energy's water right for the hydropower project is based on claims of pre-code water dating back to 1895. Under the claims, Puget Sound Energy diverts up to 2,000 cubic feet per second (cfs) from the White River for hydropower production.[1]

Puget Sound Energy filed an application with the Washington State Department of Ecology (Ecology) in 2000 to transfer 72,400 acre-feet per year (af) to a new right for municipal use (Application S2-29934). The right has a maximum instantaneous rate of diversion of 150 cfs. Ecology approved the application on June 30, 2003 and is in the process of issuing Puget Sound Energy a permit for the new right. Puget Sound Energy is examining the potential sale of the municipal water right to the Cascade Water Alliance, a consortium of Eastside cities, as well as other potential buyers.

Ecology's approval of the application is currently being challenged by the Muckleshoot and Tulalip Tribes, as well as the cities of Auburn and Buckley through the state Pollution Control Hearings Board.

Washington Water Market Overview

While Washington's water markets are largely undeveloped, a number of basins are experiencing an increasing number of transactions. These basins are primarily located in eastern and central Washington. Markets within the state tend to be localized in nature, with market boundaries typically defined by a basin or sub-basin.

[1] State of Washington Department of Ecology, Report of Examination, Lake Tapps Reservoir Supply Project Application S2-29934. June 30, 2003.

Consequently, local supply and demand conditions strongly influence trading activity as well as price.

A review of the specific markets in eastern and central Washington is provided immediately following the examination of western Washington water right transaction. Also included is an overview of municipal and urban related water right transaction in other comparable states.

Western Washington Market Activity

Transactions in western Washington remain relatively thin. The primary market activity is driven by property development and mitigation needs. Consequently, most transactions involve relatively small quantities of water. Most of the recorded transactions have occurred in the southern Puget Sound region. The primary buyers in western Washington include:

- Small Municipalities
- Private Water Purveyors
- Golf Courses
- Real Estate Developers
- Industrial Developments

A total of 12 water right transactions located in the greater Puget Sound region were identified and verified during the period from 1996 to 2003. Table 1 provides a summary of the recorded water right transactions identified in the Puget Sound region. All of the recorded transactions were permanent sales or options to permanently acquire water rights. The majority of transactions occurred during the period from 2000 to 2003. This suggests that the sale and purchase of water rights within the region is increasing in frequency and is becoming an acceptable method for securing water supplies. With one exception, all transactions were located in the south Puget Sound region.

Table 1
Summary of Comparable Sales

Ref #	Year	Seller	Buyer	Total Price	Quantity (AF)	$/AF Cap Rate	$/cfs Cap Rate	$/MGD Cap Rate	Source	County
1	1998	Irrigation	Municipal	$ 10,000.00	8	$ 1,250.00	$ 371,250.00	$ 1,401,345.29	Bernier Creek	Thurston
1	1998	Irrigation	Municipal	$ 50,000.00	40	$ 1,250.00	$ 371,250.00	$ 1,401,345.29	Chehalis River	Thurston
3	1996	Industrial	Municipal	$ 1,360,000.00	2,6565	$ 51.20	$ 36,998.76	$ 57,393.71	Ebey Slough	Snohomish
4	N/A	Irrigation	Municipal	$ 67,200.00	84	$ 800.00	$ 237,600.00	$ 896,860.99	Groundwater	Lewis
5	2000	Domestic	Municipal	$ 570,627.00	171	$ 3,337.00	$ 991,089.00	$ 3,741,031.39	Puyallup	Pierce
6	2003	Irrigation	Mitigation	$ 95,400.00	106	$ 900.00	$ 294,030.00	$ 1,008,968.61	Chehalis River	Lewis
7	2002	Sand & Gravel	Mitigation	N/A	53	$ 800.00	N/A	N/A	Groundwater	Lewis
8	2002	Industrial	Municipal	$ 3,600,000.00	6,725	$ 535.29	$ 158,981.38	$ 600,101.83	Groundwater	Pierce
9	1996	Irrigation	Municipal	$ 20,000.00	30	$ 666.00	$ 198,000.00	$ 747,384.16	N/A	Lewis
10	1998	Irrigation	Municipal	$ 30,000.00	33	$ 909.00	$ 270,000.00	$ 1,019,160.21	N/A	Lewis
11	2003	Industrial	Municipal	$ 405,000.00	450	$ 900.00	$ 267,300.00	$ 1,008,968.61	Groundwater	Thurston
12	2003	Irrigation	Municipal	$ 112,000.00	40	$ 2,800.00	$ 831,600.00	$ 3,139,013.45	Groundwater	Thurston
				Average [2]		$ 1,286.12				
				Median		$ 914.43				
				Std. Dev.		$ 941.94				
				Max		$ 3,337.00				
				Min		$ 535.29				

Source: WestWater Research, LLC

[2] The summary statistics are based on 11 transactions and exclude the sale between the City of Everett and Weyerhaeuser.

Reported transaction prices varied widely with prices ranging from $51.20 to $3,337 per acre-foot. The average unit price paid for water rights purchased within the region was $1,286.12 and the median price was $914.43.[3] The majority of sales involved the purchase of irrigation water rights for industrial and municipal uses.

Transaction sizes ranged from 8 to 26,565 acre-feet, and all were significantly smaller than the municipal water right held by Puget Sound Energy. The two largest transactions involved water rights that were used for pulp and paper operations. Both water rights were purchased for municipal purposes.

In one of the first recorded water right sales in the Puget Sound, the City of Everett purchased a water right attached to a closed Weyerhaeuser pulp and paper mill. The negotiated sale price was $51.20 per acre-foot. According to the City of Everett, there was no basis for the agreed upon sale price. In addition, the mill was not in production, and therefore, the water right had not been used for an extended period of time putting the water right in jeopardy of forfeiture. Based on the specific circumstances of the water right, this transaction is considered to be a distressed asset sale and is excluded for valuation purposes.

Central and Eastern Washington Water Markets

Several active markets have emerged in central and eastern Washington within the last five years. A single buyer typically dominates these markets. The primary demands within these markets include municipal and environmental purchases. In addition, rapid growth in the energy generation sector created a short-term spike in market demand. Several new power generation facilities were proposed for siting within the region. Most of these facilities required substantial quantities for water for cooling and combustion. However, the construction of the majority of these facilities has been postponed due to the recent down turn in the energy and wholesale electricity market. The following section provides and overview of major market activity in central and eastern Washington.

US Bureau Yakima Basin Acquisitions

Current trading activity measured both in terms of number of transactions and volume of water for the state is highest in the Yakima River Basin. The primary demands within the basin are instream and municipal use. The US Bureau of

[3] The mean and median value are based on 11 transactions and exclude the sale between the City of Everett and Weyerhaeuser.

Reclamation is the most visible buyer within the market and is actively purchasing and leasing water rights to assist with federal salmon recovery efforts. At the present time, the Bureau is primarily leasing water on annual basis. Annual lease rates have ranged from $20 to $50 per acre-foot. However, the agency is also currently negotiating several permanent sales. In particular, the agency has entered into a preliminary agreement to purchase a hydropower generation water right from PacifiCorp for approximately $7,800,000 for 450 cfs (325,215 acre-feet). The agreed upon purchase unit price is $23 per acre-foot. The unit price is significantly lower than average regional market value due to the nonconsumptive nature of the PacifiCorp water right. The water right was originally issued for hydropower generation, which considered a nonconumptive use. As a result, the ability to market and transfer the water right to other consumptive uses such as municipal or industrial demands is highly limited.

West Richland Water Right Purchases

During 1999 and 2000, the Quad Cities were actively acquiring irrigation groundwater rights in the surrounding area to secure supplies for anticipated future municipal growth. The acquisition efforts were primarily led by the City of West Richland. Four permanent transactions totaling 2,515 acre-feet were completed with prices ranging from $500 to $633 per acre-foot. The total transaction value for the four purchases was approximately $1.5 million.[4] Efforts to acquire water rights slowed while the cities attempted to obtain a water permit from the Columbia River.

During 2002, the cities were awarded a permit to withdraw water from the Columbia River. The permit was condition with mitigation requirements. Ecology agreed to mitigate for the Quad Cities' new municipal water withdrawals over the next six years. The quantity of water necessary to satisfy the mitigation requirement is 3,040 acre-feet.[5]

Ecology has satisfied approximately half the required mitigation quantity through an option agreement. In late 2002, Ecology entered into a five-year option agreement to purchase up to 1,500 acre-feet from an undisclosed water right holder on the Columbia River at an exercise price of $650 per acre-foot. The option agreement satisfies the agency's mitigation obligation required by the Quad Cities water permit. The option has not been exercised and Ecology is currently seeking other water rights at a price at or below the exercise price of $650 per acre-foot.

[4] Bob Alberts, Pasco Public Works Director. Personal Communication. November 15, 2002.
[5] George Schlender, Washington Department of Ecology. Personal Communication. November 19, 2002.

2001 Yakima Basin Drought Emergency Water Bank

Trading activity among agricultural water users within the Yakima Basin increased during the 2001 summer as result of a drought emergency transfer program. A temporary drought water banking program was initiated to facilitate short-term leases between agricultural water users. A total of 30 one-year leases were approved providing approximately 62,818 acre-feet of water. The average lease price during 2001 was approximately $130 per acre-foot annually with prices ranging from $60 to $500 per acre-foot annually. The bank was not operated in 2002. However, legislation passed during the 2003 Washington Legislature authorizes water banking in the Yakima Basin.

Municipal Water Right Purchases in Other States

In other states such as Arizona, California, Colorado, and western Oregon, permanent water right purchases municipal uses are more common than in Washington. As a result, more price information is typically available in these markets. While prices in other states do not necessarily reflect market conditions in the Puget Sound region, they do provide useful points of comparison. Table 2 summarizes market transactions in the three states. The transactions were limited to permanent purchases of water rights for urban and municipal uses. In the majority of the sales, water rights were purchased from irrigators and transferred to cities or housing developers.

Table 2
Permanent Water Right Purchases for Urban Uses in Other Areas

State	Average Price ($/Acre-Foot)	Price Range ($/Acre-Foot)		Number of Transactions
Arizona	$1,466	$518	$2,000	10
California	$2,123	$1,350	$3,520	20
Colorado (CBT)	$10,754	$8,900	$14,000	123
W. Oregon	$914	$144	$2,014	13

Source: WestWater Research, LLC, Water Strategist

The transaction period ranges from 1993 through 2003.[6] The average price ranges from $914 per acre-foot in Oregon to $10,754 in Colorado. The transactions range in

[6] Transaction data in Colorado end in 1998. More recent Colorado transactions for municipal uses have shown a significant increase in price. For example, irrigation rights sold for municipal uses within the Colorado-Big Thompson are currently selling for more than $10,000 per acre-foot.

size from 5 acre-feet to 50,000 acre-feet. Prices were adjusted to current dollars using the Consumer Price Index.[7] The prices reported in this section are provided to illustrate the price paid for municipal water in rapidly growing areas.

With the exception of Colorado, the observed prices in other regional markets are comparable to those observed in the Puget Sound water market. In particular, reported prices from the western Oregon and the Portland metro area are of a similar range and magnitude as expected given the similarities between the climatic conditions and population growth occurring in both areas.

Summary and Conclusion

Provided as the first phase of the valuation analysis, this market consultation report includes a brief overview of recent transactions within the Puget Sound region, the State of Washington, and other western states.

- Specifically, twelve transactions are analyzed within the Puget Sound region.
- With the exclusion of the distressed asset sale, the range of market values for the eleven remaining transactions is $535 to $3,337 per acre-foot with a median of $900 per acre-foot and average of $1,286 per acre-foot. This range of values provides a broad valuation overview of the Puget Sound Energy water right.
- Based on the observed mean and median value, the estimated value of the Lake Tapps municipal water right held by Puget Sound Energy ranges from $65 million to $95.4 million. **These values are preliminary and are intended for internal use only.** Furthermore, these estimates assume that the entire quantity of the water right is fully transferable and that no price premium reduction is necessary to account for the transaction size or season factors. **The preliminary value range is subject to change based on additional information and further investigation.**
- The sale of the Lake Tapps municipal water right would be one of the largest transactions in Puget Sound region as well as the state. Therefore, limited direct comparable sales are available. Within the eleven observations, the largest transaction is 6,725 acre-feet, while the median is 52 acre-feet and the average is

[7] U.S. Bureau of Labor Statistics, November 2001. The CPI is a conservative adjustment for inflation. Previous research from other market areas indicates that water prices typically rise faster than the rate of inflation.

704 acre-feet. Based on the record transactions, a correlation between price and quantity could not be established.

- The unit price for the largest observed transaction in the Puget Sound region was $535 per acre-foot, approximately half the average unit price for region. This single transaction suggests that economies of scale for large volume sales may be appropriate for the Puget Sound market. However, further investigation and research is necessary to determine if any adjustment is necessary and the appropriate level of adjustment.

- Evidence from developed water markets indicates that transactions involving large quantities of water sell for less on a per unit basis than small water sales because transaction costs are spread over a larger volume of water. For this analysis, limited market information makes the impact of water volume on price difficult to quantify.

- A comparable sales analysis is required to recommend a price and premium adjustments based on the market, legal, and physical characteristics of the Lake Tapps water right.

- The comparable sales analysis will most likely result in a narrower range of values. Due to the limited amount of transactions, a supporting valuation approach is recommended to validate the comparable sales results. For example, an income valuation and/or comparison of municipal water wholesale charges would enhance the reliability of the valuation.

Additional Transaction Research

WestWater Research is currently investigating additional sales in the region to confirm the occurrence of the transaction and specific terms, price and quantity. The following transactions are under investigation:

- Water right Lease between Willows Run Golf Course and King County
- Water right Sale between Pierce County and a sand and gravel operation
- Water right purchases by a private water purveyor in Thurston, Mason, and Lewis counties.
- Proposed water right sale by Yarrow Point
- Proposed water right sale by a landowner located in Snohomish County
- Proposed water right sale between Weyerhaeuser and the City of North Bend

Regional Whole Water Rates

Municipal water demands within the eastern region of Puget Sound are expected to increase. Existing municipal wholesale water suppliers such as the City of Seattle and the Snohomish River Regional Water Authority are reasonable alternative water supply sources for communities and cities facing water shortages. Small public or private water purveyors that supply residential and commercial water users typically purchase water at wholesale rates. Currently, the Seattle Water Department and the Snohomish River Regional Water Authority (Everett Water Utility District) are Washington's two largest water wholesale suppliers. Combined, these two entities supply over 90 percent of all wholesale water in the area.

The wholesale water rates charged by Seattle and Everett vary depending on the wholesale customer's location, season of use, and the number of retail customers served. Table 3 summarizes the rates. Seattle charges an additional $0.46 per 100 cubic feet ($200 per acre-foot annually) fee for water usage beyond a base allowance of usage. In practice, most wholesale customers pay the growth charge because they typically exceed this quantity. Using a nine percent discount rate, the capitalized value of wholesale water rates range from $1,011 to $6,767 acre-foot.

Table 3
Wholesale Water Rates in Western Washington

Utility	Rate ($/100 cf/year)	Rate ($/AF/year)
Seattle Water Department		
Off Peak Usage (Sept. 16 – May 15)	$0.73	$318
Peak Usage (May 16 – Sept. 15)	$1.12	$487
Growth Charge	$0.46	$200
Everett Water Utility		
East of Snohomish River	$0.21	$91
West of Snohomish River-nonpumped	$0.44	$191
West of Snohomish River-pumped	$0.64	$278
Less than 100 Customers	$1.40	$609

Source: Seattle Water Department and Everett Water Utility.

Regional wholesale water rates could be used as a basis for estimating the value and cost of alternative water supplies within the Puget Sound. As a part of a detailed water right appraisal, WestWater Research will analyze regional wholesale water rates to value the Lake Tapps water right based on an alternative cost and income capitalization rate.

Western Washington Water Transaction Reports

The following section provides a summary of individual water right transactions identified in western Washington and the Puget Sound Region.

Transaction 1: Thurston County

Grantor:	Richard Carter
Grantee:	Thurston County
Water Right No.	S2-22057
Transaction Date:	1998
Total Sale Price:	$10,000
Unit Price:	$1,250 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	36 gallons per minute
Quantity (Qa):	8 acre-feet
Terms:	Permanent Purchase
Priority Date:	March 22, 1974
Location:	Grand Mound
Source:	Bernier Creek, a tributary to the South Fork of the Newaukum River
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	May 1 to October 1
Comments:	Thurston County initiated water acquisition efforts in 1997 to secure water supplies for the community of Grand Mound. The county announced in the local paper that it was seeking bids and proposals for the purchase of water rights. The effort resulted in the purchase of two water rights. The county acquired an irrigation surface water right from a farm that was being sold. The water right is considered a reliable within the Chehalis River. However, the water right transfer was conditioned and is subject to restrictions if flows drop below specified levels.
Verification:	Jim Bachmeir, Thurston County Don Davidson, Washington Department of Ecology

Transaction 2: Thurston County

Grantor:	Don Von Kolk
Grantee:	Thurston County
Water Right No.	S2-22514
Transaction Date:	1998
Total Sale Price:	$50,000
Unit Price:	$1,250 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	100 gallons per minute
Quantity (Qa):	40 acre-feet
Terms:	Permanent Purchase
Priority Date:	May 29, 1974
Location:	Grand Mound
Source:	Chehalis River
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	May 1 to October 1
Comments:	The county acquired an irrigation surface water right from the Chehalis River from a farm that was being converted to residential property. The buyer's asking price was initially $5,000 per acre-foot. The water right is considered a reliable within the Chehalis River. However, the water right transfer was conditioned and is subject to restrictions if flows drop below specified levels.
Verification:	Jim Bachmeir, Thurston County Don Davidson, Washington Department of Ecology

Transaction 3: City of Everett

Grantor:	Weyerhaeuser
Grantee:	City of Everett
Water Right No.	S1-10617C
Transaction Date:	1996 with final payment in 2002
Total Sale Price:	$1,360,000
Unit Price:	$51.20 per acre-foot
Volume (Qi):	36 million gallons per day
Quantity (Qa):	23.7 million gallons per day (26,565 acre-feet)
Terms:	Permanent Purchase
Priority Date:	February 28, 1969
Location:	City of Everett
Source:	Ebey Slough, a tributary to Snohomish River
Previous Use:	Pulp Mill Operations
New Use:	Municipal
Period of Use:	Year Round
Comments:	The city made an initial payment of $1,000,000 to Weyerhaeuser in 1996 and a final payment of $10,000 per mgd based on the peaking (Qi) quantity approved by Ecology. A second and final payment of $360,000 was made in 2002. The water right was transferred to the Snohomish River Regional Water Authority. The City of Everett is a member of the authority. There was no basis for the agreed upon price. The sale also included some infrastructure. However, the city indicated that the primary motivation for the sale was the water right.
Verification:	Jim Miller, City of Everett Dan Swenson, Washington Department of Ecology

Transaction 4: Little Rock Water Works

Grantor:	Undisclosed
Grantee:	Little Rock Water Works
Water Right No.	G2-2469 G2-22186
Transaction Date:	**To Be Verified**
Total Sale Price:	$67,200 **To Be Verified**
Unit Price:	$800 per acre-foot for each acre-foot transferable and usable by the grantee. **To Be Verified**
Volume (Qi):	480 gallons per minute (combined)
Quantity (Qa):	84 acre-feet
Terms:	Permanent Purchase
Priority Date:	March 3, 1953 February 4, 1974
Location:	Little Rock
Source:	Groundwater
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	Little Rock Water Works is a small privately owned water company that purchased water rights to expand its service area.
Verification:	Keith Tiede, Little Rock Water Works Don Davidson, Washington Department of Ecology

Transaction 5: City of Puyallup

Grantor:	Confidential – Commercial & Residential Property Developer
Grantee:	City of Puyallup
Water Right No.	Water Right Easement
Transaction Date:	2000
Total Sale Price:	$570,627
Unit Price:	$3,337.00 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	152,640 gallons per day
Quantity (Qa):	171acre-feet
Terms:	Permanent Donation for Consideration for Water Supply to Property Development
Priority Date:	Not Applicable
Location:	City of Puyallup
Source:	City Water Main
Previous Use:	Domestic
New Use:	Municipal
Period of Use:	Year Round
Comments:	Developer purchased and is in the process of developing land with an associated water easement issued by City of Puyallup in 1924 and expanded in 1939. In consideration for constructing a water main beneath the property, the city granted a perpetual easement to the original property owner for the use of a three-quarter inch tap of the city's water main.
Verification:	WestWater Research Files

Transaction 6: Energy Development

Grantor:	Confidential – Landowner
Grantee:	Confidential – Energy Generation Development
Water Right No.	Confidential
Transaction Date:	2003
Total Sale Price:	$95,400
Unit Price:	$900 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	1 cubic foot per second
Quantity (Qa):	106 acre-feet
Terms:	Option to Permanently Purchase. Expected to be exercised August, 2003
Priority Date:	September 14, 1943
Location:	Chehalis
Source:	Unnamed Slough Adjacent to Chehalis River
Previous Use:	Irrigation
New Use:	Mitigation – Trust Water Right
Period of Use:	April 15 to October 1
Comments:	Developer purchased to comply with mitigation requirements for energy project site certification agreement. The developer holds a one year option that is expected to be exercised before the end of August, 2003.
Verification:	WestWater Research Files

Transaction 7: Energy Development

Grantor:	Confidential – Landowner
Grantee:	Confidential – Energy Generation Development
Water Right No.	Confidential
Transaction Date:	2002
Total Sale Price:	To Be Determined
Unit Price:	$1,000 for 12 month option Exercise price $800 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	600 gallons per minute
Quantity (Qa):	52.46 acre-feet
Terms:	Option to Permanently Purchase.
Priority Date:	July 27, 1960
Location:	Chehalis
Source:	Groundwater
Previous Use:	Sand & Gravel
New Use:	Mitigation – Trust Water Right
Period of Use:	Year Round
Comments:	Developer purchased to comply with mitigation requirements for energy project site certification agreement. The developer holds a one year option but is not expected to exercise the option. The developer holds a second option with similar terms for an irrigation water right.
Verification:	WestWater Research Files

Transaction 8: Steilacoom Municipal Sale

Grantor:	Confidential – Pulp & Paper Facility
Grantee:	Confidential – Municipal Water District
Water Right No.	Includes 3 water rights
Transaction Date:	To be completed – Terms Agreed upon November, 2002
Total Sale Price:	$3,600,000
Unit Price:	$535.29 per acre-foot
Volume (Qi):	6 million gallons per day
Quantity (Qa):	6 million gallons per day (6,725 acre-feet)
Terms:	Permanent Sale
Priority Date:	-
Location:	Steilacoom
Source:	Groundwater
Previous Use:	Pulp & Paper Operations
New Use:	Municipal Use
Period of Use:	Year Round
Comments:	This transaction will be completed upon final approval by the Washington Department of Ecology. A transfer application has been filed with the department, but was delayed due to the Lake Tapps water right application.
Verification:	WestWater Research Files

Transaction 9: Boistfort Valley Water Corp.

Grantor:	Ethan Allen
Grantee:	Boistfort Valley Water Corp
Water Right No.	**To Be Verified**
Transaction Date:	1996
Total Sale Price:	$20,000
Unit Price:	$666 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	30
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Chehalis
Source:	**To Be Verified**
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	
Verification:	Richard Eitel, Boistfort Valley Water Corp.

Transaction 10: Chehalis Area Purchase Agreement

Grantor:	Gary Duryea
Grantee:	Bill Allegre
Water Right No.	**To Be Verified**
Transaction Date:	1998
Total Sale Price:	$30,000
Unit Price:	$909 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	33 acre-feet
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Chehalis
Source:	**To Be Verified**
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	April 15 to October 1
Comments:	A purchase and sale agreement was entered into by the parties, but the water right transfer was denied by the Washington Department of Ecology
Verification:	Bill Allegre

Transaction 11: Lacey Area Purchase Agreement

Grantor:	Confidential
Grantee:	Confidential
Water Right No.	Unperfected Permit
Transaction Date:	To be completed – Sale Terms Agreed upon in 2003
Total Sale Price:	$405,000
Unit Price:	$900 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	450 acre-feet
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Lacey
Source:	Groundwater
Previous Use:	Commercial and Industrial
New Use:	Municipal
Period of Use:	Year Round
Comments:	The parties have entered into a purchase and sale agreement and a transfer application has been submitted to the Washington Department of Ecology.
Verification:	Tom McDonald, Perkins Coie

Transaction 12: Black Lake Area Purchase Agreement

Grantor:	Confidential
Grantee:	Confidential
Water Right No.	Confidential
Transaction Date:	To be completed – Sale Terms Agreed upon in 2003
Total Sale Price:	$112,000
Unit Price:	$2,800 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	40 acre-feet
Terms:	Permanent Purchase
Priority Date:	1960s Senior Water Right
Location:	Lacey
Source:	Groundwater
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	The parties have entered into a purchase and sale agreement and a transfer application has been submitted to the Thurston County Conservancy Board. The water right is located in the Black River Basin, a tributary to the Chehalis River. The region has a limited number of water rights.
Verification:	Tom McDonald, Perkins Coie

West Water Research LLC
121 Grand Avenue, Suite 222
Laramie, WY 82070

Privileged and Confidential Information

DRAFT REPORT

Memorandum

To: Kyle Branum, Perkins Coie
From: Clay Landry
Date: October 3, 2003
Re: Regional Alternative Supply Valuation Analysis

Purpose

The purpose of this analysis is to provide a comparison of costs for alternative water supply options within the Puget Sound Region. This review provides the basis for a development cost approach to valuing the Lake Tapps water right. The development cost approach is one of four primary methods used to estimate the fair market value of water rights.

Development Cost Approach

The development cost approach estimates the current cost of reproducing or replacing an equivalent quantity of water. The approach is commonly used in areas where water rights are limited and the market price for water is dominated by investment alternatives that increase water supply. This approach is typically viewed as an approach of last resort if comparable sales and income capitalization approaches are not feasible. In the case of the Lake Tapps water right, both the comparable sales income capitalization approaches are appropriate. The development cost information is presented to provide a bench mark for these other valuation methods. In addition some of the information developed in this analysis would be used in an income capitalization approach.

The development cost approach should be used when there is strong market evidence that indicates users are willing to pay price levels equal to the development cost of additional supplies. Within the Puget Sound Region, there is sufficient market evidence that indicates new and expanding water demands are willing to pay price

levels equivalent to the cost of developing new sources. Major industrial, commercial, domestic, and municipal water demands within the region are served primarily by wholesale and retail purveyors. Regional water rates are primarily based on capital cost recover plus a modest margin for future capital needs.

Scope of Investigation

This review examines the comparative cost of alternative water supply options within the Puget Sound. This includes the development of new sources of water as well as water purchases from the region's three primary wholesale water purveyors. Municipal water supply plans and the 2001 Central Puget Sound Regional Water Supply Outlook were reviewed to identify costs associated with new water supply proposals. This information was verified by contacting the municipalities and through supporting information provided by HDR. Information on wholesale water supplies was obtained by directly contacting the region's major providers. The following documents were reviewed in the development of this analysis:

- Comprehensive Water Plan Update Volume 1. Prepared for the City of Tacoma Water Public Utilities. Prepared by Economic & Engineering Services, Inc in association with CH2M HILL. September 2000.
- Snoqualmie Aquifier Project Cost and Delivery Alternatives Update. Prepared for East King County Regional Water Association and Golder Associates, Inc. Prepared by HDR Engineering, Inc. October 23, 1996.
- Water Comprehensive Plan. Prepared for the City of Bellevue. Prepared by Randall L Thompson, Professional Engineer and Melinda J Friedman, Professional Engineer. 1998.
- Water Supply Operations Plan - Alternative Evaluation. Prepared for the City of Issaquah. Prepared by Economic and Engineering Services, Inc. July 2003.
- City of Issaquah 2002 Water System Plan Update Volume 1. Prepared for the City of Issaquah. Prepared by Roth Hill Engineering Partners, LLC in 2000 and 2001.
- Proposed Second Supply Project Agreement Final Environmental Statement. Prepared by Seattle Public Utilities. October 2000.
- Proposed Second Supply Project Agreement Final Environmental Impact Statement
- Appendix B- Comments and Responses to Comments on the Draft EIS. Prepared by Seattle Public Utilities, October 2000.
- City of Issaquah 2002 Water System Plan Update Volume 2 Appendices. Prepared for the City of Issaquah. Prepared by Roth Hill Engineering Partners, LLC. 2002.

- Woodinville Water District comprehensive Water Plan. Prepared for Woodinville Water District. Prepared by HDR Engineering, Inc. and Financial Consulting Solutions Group, Inc. October 2000.

- Sammamish Plateau Water and Sewer District; Water Comprehensive Plan. Prepared for the Sammamish Plateau Water and Sewer District of King County, Washington. Prepared by CH2MHILL in association with FCS Group, May 2001.
- Northshore Utility District and Woodinville Water District Water Supply Project Reconnaissance Level Cost Assessment Draft Technical Memorandum. Prepared for Northshore Utility District. Prepared by HDR Engineering, Inc. December 12, 2000
- Snohomish River Regional Water Authority Water Rights Transfer Project Technical Memorandum. Prepared for Woodinville Water District. Prepared by HDR Engineering, Inc. June 1999.

Comparative Cost of Alternative Water Supply

This section examines the relative costs associated with existing and proposed water supply alternatives within the Puget Sound Region. The review is divided into two sections:

1) New Water Source Development,
2) Wholesale Water Supplies.

For comparison purposes, all costs and rates are converted to a capitalized unit price and are reported on a price-per-acre-foot and price-per-million-gallons-per-day basis. All annualized costs and rates are capitalized using a 6 percent discount rate over a 25-year period. These terms are on consistent with those used in the 2001 Central Puget Sound Regional Water Supply Outlook.

New Water Source Development

The 2001 Central Puget Sound Regional Water Supply Outlook provided a comprehensive review of major water supply projects proposed within the region. A total of 17 major regional municipal water supply projects have been examined by Puget Sound water suppliers. These projects can be classified in four general categories.

- Development of new ground and surface water sources.
- Expansion of existing ground and surface water sources.
- Water storage development through reservoir expansion or aquifer storage and recovery.

- Connection and interties to allow source sharing and conjunctive use of supplies.

Table 1 provides a summary of the 17 proposed regional water supply projects. The table includes the sponsor agency, expected firm yields, and the current status of the project.

Comparative Cost Analysis for New Projects

The following sections identify assumptions and methods used to estimate a capitalized unit cost for each project. Capitalized unit cost estimates were developed for each project to provide a comparison across projects. Several key assumptions were necessary to develop these unit cost estimates. The following describes the assumptions used to calculate the unit prices.

Assumption 1: Project Cost

Total project cost estimates were available for 14 projects. Cost estimates were obtained for both capital expenditures and annual operation and maintenance (O&M) costs.[1] All project costs, including annual O&M charges, were capitalized based on the terms described above. All project costs are reported in 2002 dollars.

The accuracy of the capital cost estimates vary based on the stage of development of the projects. Some projects have not been developed beyond the conceptual stage, while others are currently under design and in construction. Therefore, cost estimates for projects in the conceptual stage are preliminary and subject to change. However, the costs reported are based on the best available estimates.

Assumption 2: Water Rights and Sourcing Costs

None of the projects reviewed included a cost for obtaining water rights or sourcing raw water supplies. Project costs were limited to capital expenditures and operation and maintenance costs. However, the acquisition of water rights or purchase of raw water supplies is expected to be a relevant project cost in the near future.

Nearly all of the projects reviewed would require new or additional water rights. However, the ability to develop and obtain new water rights within the basin for significant withdrawals is limited due to tribal and environmental requirements.

In general, project scoping studies did not thoroughly evaluate availability and feasibility of obtaining water rights existing or new water rights. This is a significant project risk that under estimate total project costs. After reviewing a wide range of proposals, WestWater Research is of the opinion that the feasibility of many of the 17 proposed projects hinges on the ability to obtain water rights or source raw water supplies. In fact, several purveyors within the region have indicated that a number of water supply alternatives have been eliminated or delayed because of difficulties

[1] Operation and maintenance costs were not available for the Central Pierce County Source Development and Intertie project and the Oasis ASR project. The average O&M cost for the group was used as a proxy for these projects.

associated with obtaining water rights or due to tribal and environmental restrictions associated with existing water rights.[2]

Firm Yield Quantity

The estimated unit price for each project is based on the average annual firm yield quantity. The firm yield represents the reliable annual water supply. Due to variability in flow and climatic conditions, the projects identify a low and high range for the firm yield. In general, high firm yield estimates correspond with the required water right quantity. In some cases, however, water rights are restricted due to tribal and environmental flow requirements. Therefore, the high firm yield estimate is below the water right annual quantity. Unit prices are reported based on both the low and high firm yield estimates.

Project Cost Comparisons

Based on the assumptions presented above, total project costs were estimated. These cost represent the capitalized costs are comparable to permanent sale prices of water rights and other related water assets. Table 2 provides a summary of the estimate project costs. The table presents both total projects costs and unit prices based on an million gallons per day (MGD) and acre-foot basis.

The average unit price for the projects based on the high yield quantity is $4,516 per acre-foot ($5.0 M per MGD). The average project size measured based on maximum firm yield was 34,182 acre-feet (30.5 MGD). The largest project was Lake Tapps with a firm yield of 72,352 acre-feet (64 MGD). The smallest project was the Central Pierce County Source Development and Intertie project.

The most expensive project on a unit basis was the Lake Youngs drawdown. The estimated unit price is $10,553 per acre-foot ($11.8M per MGD). Currently, Seattle Public Utility operates Lake Youngs to balance with its Cedar River water supply. The proposed project utilizes storage at Lake Youngs in addition to diversions from Cedar River to increase Seattle's overall water supply. The project could yield up to 20 MGD of additional firm yield. The capital costs are $205.2 million with annual O&M expenses of $2.4 million. The capital and O&M costs are primarily associated with additional treatment capacity.

The least expensive project was the Cedar River dead storage project sponsored by Seattle Public Utilities. This project proposes to drawdown the Chester Morse reservoir from a minimum pool elevation of 1,532 feet to 1,502 feet. The additional drawdown would yield approximately 34,000 acre-feet. The project would require additional pumping and conveyance systems. The estimated project cost is $21.7 million with annual O&M charges of $592,000. The project has potential impacts on bull trout and Chinook salmon.

[2] For example, the Tacoma Water Comprehensive Water Plan Update (September 2000) and the Seattle Public Utilities 2001 Water System Plan Update both identify water rights as a key issue to future development.

Table 1
Puget Sound Regional Water Supply Options

Project Name	Status	Leading Agency	County	Source	Water Rights		Firm Yield Average Annual (MGD)		
					Qa (MGD)	Qi (MGD)	Low	High	Peak
Weyerhaeuser Water Right	Permitted	SRRWA	Snohomish Co	Snohomish River	23.70	36.00	18.00	23.70	36.00
Sultan Basin Expansion	Conceptual	Everett/Snohomish PUD	Snohomish Co	Sultan River	64.00	129.00	50.00	64.00	129.00
Everett/SPU Intertie	Conceptual	Everett/Snohomish PUD	Snohomish Co	Sultan River	20.00	40.00	9.50	20.00	40.00
Green River Second Supply	Under Design	Tacoma Public Utility	King Co.	Green River	N/A	65.00	40.00	45.00	65.00
Cedar Dead Storage	Permitted	Seattle Public Utility	King Co.	Cedar River	N/A	N/A	20.00	39.00	N/A
Lake Youngs Drawdown	Permitted	Seattle Public Utility	King Co.	Cedar River	N/A	N/A	-	20.00	N/A
OASIS ASR Project	Permitted	Lakehaven Utility District	King Co.		-	-	25.89	25.90	N/A
South Fork Tolt Additional Drawdown	Permitted	Seattle Public Utility	King Co.	Tolt River	N/A	N/A	-	8.00	N/A
Snoqualmie Aquifer	Permitted	EKCRWA, SPU	King Co.	Groundwater	N/A	N/A	9.00	16.00	N/A
Lake Washington Withdrawal	Preliminary Design	Shoreline	King Co.	Lake Washington	N/A	N/A	8.00	8.00	8.00
North Fok Tolt Diversion	Preliminary Design	Seattle Public Utility	King Co.	Tolt River	N/A	N/A	8.00	40.00	N/A
Chambers Creek Properties Project	Permitted	Pierce Co.	Pierce Co	Groundwater	22.00	14.00	2.30	14.00	N/A
Central Pierce County Source Development	Conceptual	Pierce Co.	Pierce Co	Groundwater	5.00	5.00	2.00	5.00	5.00
Lake Tapps Project - Low Capital Costs	Permitted	Puget Sound Energy	Pierce Co	Lake Tapps	64.60	96.70	64.60	64.60	96.70
No Cost Data									
French Creek Project	Preliminary Design	Northshore Utility District	King Co.	Snohomish River	25.00	25.00	25.00	25.00	25.00
Auburn Subregional Groundwater Supply	Preliminary Design	Auburn	King Co.	Groundwater	N/A	N/A	N/A	N/A	N/A
Gig Harbor Peninsula Central Supply	Preliminary Design	Washing Water Svcs.	King Co.	Groundwater	N/A	N/A	N/A	N/A	N/A

Source: 2001 Central Puget Sound Regional Water Supply Outlook

Table 2
Alternative Water Supply Project Costs (2002 Dollars)

	Project Cost (millions)						
	Capital Cost	O&M	Total	Low Yield $/MGD	High Yield $/MGD	Low Yield $/AFT	High Yield $/AFT
Weyerhaeuser Water Right	$166.40	$31.91	$198.31	$11,017,070	$8,367,395	$9,836.67	$7,470.89
Sultan Basin Expansion	$302.64	$75.78	$378.42	$7,568,395	$5,912,808	$6,757.50	$5,279.29
Everett/SPU Intertie	$158.08	$13.29	$171.37	$18,039,441	$8,568,735	$16,106.64	$7,650.66
Green River Second Supply	$237.43	$47.86	$285.29	$7,132,322	$6,339,842	$6,368.14	$5,660.57
Cedar Dead Storage	$21.74	$7.58	$29.31	$1,465,699	$751,640	$1,308.66	$671.11
Lake Youngs Drawdown	$204.88	$31.51	$236.39	-	$11,819,421	-	$10,553.05
OASIS ASR Project	$117.52	$20.80	$138.32	$5,342,024	$5,340,581	$4,769.66	$4,768.38
South Fork Tolt Additional Drawdown	$15.50	$6.09	$21.58	-	$2,698,121	-	$2,409.04
Snoqualmie Aquifer	$81.02	$10.56	$91.57	$10,174,665	$5,723,249	$9,084.52	$5,110.04
Lake Washington Withdrawal	$23.50	$11.43	$34.94	$4,367,179	$4,367,179	$3,899.27	$3,899.27
North Fok Tolt Diversion	$115.44	$17.02	$132.46	$16,557,150	$3,311,430	$14,783.17	$2,956.63
Chambers Creek Properties Project	$40.87	$9.36	$50.23	$21,840,000	$3,588,000	$19,500.00	$3,203.57
Central Pierce County Source Development &	$4.16	$0.74	$4.90	$2,448,160	$979,264	$2,185.86	$874.34
Lake Tapps Project -Alternative 1:Connect Tacoma Water	$142.48	$54.51	$196.99	$3,049,353	$3,049,353	$2,722.64	$2,722.64
Lake Tapps Project - Alternative 2: Seattle/Tacoma Intertie	$160.16	$54.51	$214.67	$3,323,038	$3,323,038	$2,967.00	$2,967.00
Lake Tapps Project - Alternative 3: SPU Lake Youngs	$193.44	$58.50	$251.94	$3,899,948	$3,899,948	$3,482.10	$3,482.10
Lake Tapps Project - Alternative 4: Connect CWA	$247.52	$67.80	$315.32	$4,881,160	$4,881,160	$4,358.18	$4,358.18
Lake Tapps Project - CWA Phased Development	$270.00	$97.15	$367.15	$5,683,491	$5,683,491	$5,074.55	$5,074.55

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Lake Tapps Project Costs

Several studies have been conducted to estimate the capital costs required to develop the Lake Tapps municipal water right. Puget Sound Energy commissioned the Lake Tapps Reservoir Water supply Reconnaissance Report by HDR in November, 2000. This analysis examined four "source to delivery" alternatives. However, the report does not examine the phased conveyance and water development plan currently proposed by Cascade Water Alliance. The phased proposal includes additional water treatment and conveyance costs. HDR has indicated in a recent memo to Puget Sound Energy that further cost estimates are necessary based on Cascade's current water development proposal. HDR has developed preliminary cost estimates based Cascade's proposal.[3]

For the purposes of comparison, project cost estimates for the four source-to-delivery scenarios and the Cascade phased proposal are presented.

Table 3
Lake Tapps Water Supply Alternatives
Project Cost Requirements (2002 Dollars)

	Capitalized Cost (millions)				
Lake Tapps Alternative	**Capital**	**O&M**	**Total**	**$/MGD**	**$/aft**
Lake Tapps Project - Alternative 1:Connect Tacoma Water	$142	$55	$205	$3,171,328	$2,832
Lake Tapps Project - Alternative 2: Seattle/Tacoma Intertie	$160	$55	$223	$3,455,959	$3,086
Lake Tapps Project - Alternative 3: SPU Lake Youngs	$193	$58	$262	$4,055,946	$3,621
Lake Tapps Project - Alternative 4: Connect CWA	$248	$68	$328	$5,076,406	$4,533
Lake Tapps Project - CWA Phased Development	$281	$101	$382	$5,910,830	$5,278

Source: HDR

[3] HDR's memo to Puget Sound Energy on September 3, 2003 indicated that the cost estimates for Cascades proposal were derived from a variety of references and only represent a portion of the principal project costs. The memo emphasized that a comprehensive examination of the proposed phased water supply project should be performed prior to the use of the costs presented by HDR.

Puget Sound Wholesale Water Supplies

Wholesale water is a primary water source for a large number of municipalities and private water purveyors within the Puget Sound. These municipalities and private water purveyors resell water purchased from wholesale providers. The three primary wholesale water providers in the Puget Sound include:

- Seattle Public Utility
- City of Everett
- Tacoma Public Utility

The Seattle Public Utility and the City of Everett are the region's two largest water wholesale suppliers. These two entities supply over 90 percent of all wholesale water within the region and. In addition, several municipal water purveyors are examining the feasibility of developing regional water supplies. Within the Lake Tapps region, these include Pierce County and Lakehaven Water District. The following sections provide a summary of the major wholesale water distribution within Puget Sound Region.

Seattle Public Utility

Seattle Public Utility is the largest wholesale provider in the region serving a proximately 26 direct and indirect water purveyors. The estimated wholesale water volume sales are 66 million gallons per day. This represents approximately 45 percent of all water produced by Seattle Public Utility. The remaining portion is sold directly to customers within Seattle's service area.

Table 4
Wholesale Customers of Seattle Public Utilities
(Seattle Purveyors)

Cities	Water Districts
City of Bellevue	Cedar River Water & Sewer District
City of Bothell	Coal Creek Utility District
City of Duvall	Highline Water District
City of Edmonds	Lake Forest Park Water District
City of Kirkland	Northshore Utility District
City of Mercer Island	Olympic View Water & Sewer District
City of Redmond	Shoreline Water District
City of Renton	Skyway Water & Sewer District
City of Tukwila	Soos Creek Water & Sewer District
	Woodinville Water District
	Water District No. 20
	Water District No. 45
	Water District No. 49
	Water District No. 85
	Water District No. 90
	Water District No. 119
	Water District No. 125

Source: Seattle Public Utilities

Seattle estimates that after 2010 demand from the wholesale sector will grow faster than the underlying growth in population due to the effects of rising real household income and declining household size. As a result, total demand for Seattle is forecasted to reach 159 MGD by 2020, with wholesale water sales representing 76 MGD. That represents a 15 percent increase in wholesale water demand over the next 17 years.

The wholesale water rates charged by Seattle vary depending on the wholesale customer's season of use, and the number of retail customers served. Table 5 provides the wholesale water rates charged by Seattle. In addition, Seattle charges an additional $0.68 per ccf fee for water usage beyond a base allowance of usage. In practice, most wholesale customers pay the growth charge because they typically exceed this quantity.

Table 5
Seattle Wholesale Water Rates

	Old Contracts ($/ccf/YR)	New Contracts ($/ccf/YR)
Off Peak Usage (Sept. 16 – May 15)	$0.77	$0.72
Peak Usage (May 16 – Sept. 15)	$1.17	$1.10
Growth Charge	$0.68	$0.60

Source: Seattle Public Utilities

These charges reflect billing rates for existing contracts. In the last two years, a new wholesale rate structure was negotiated and some wholesale customers have begun switching to the new schedule. Rates under the new schedule are slightly lower. However, a new one-time service fee is charged under the new schedule.

City of Everett

The City of Everett's primary water source is the Sultan River, which supplies approximately 75 percent of the population of Snohomish County. Everett provides wholesale water to 27 purveyors. The estimated wholesale water volume sales are 40 MGD. Alderwood Water District is the largest wholesale customer and represents approximately half of all wholesale water sales for Everett.

Table 6
City of Everett Wholesale Customers

Cities and Districts		
Alderwood Water District	Roosevelt Water Association	Fobes District Water
City of Marysville	Three Lakes Water Association	North Ridge Water
Snohomish PUD	Machias Ridge Estate	Aldercrest Water District
Mukilteo Water District	Shulter Water Association	Joywood Water Line
Cross Valley Water District	Sultan Estates Water	Mt. View Terrace Water District
City of Monroe	Klahaya Receivership	Pilchuck 26 Tracks Water Assc.
City of Snohomish	Meadow Lake Water Association	West Machias Water Association
Highland Water District	Friar Creek Water	Blackman Lake Water District

Source: City of Everett

Everett's wholesale water rates vary depending on the customer's location within the city's service area as well as the number of retail customers served. Table 7 provides the wholesale water rates charged by Everett. Alderwood resells water to communities of Lynwood, Edmonds, Olympic View and Mountain Terrace at a mark up of $0.15 per ccf over the wholesale rate of $0.52 per ccf.

Table 7
City of Everett Wholesale Water Rates

	Old Rate $/ccf/YR	New Rate $/ccf/YR
East of Snohomish River	$0.55	$0.66
West of Snohomish River-nonpumped	$0.52	$0.62
West of Snohomish River-pumped	$0.94	$1.13
Less than 100 Customers	$1.40	$1.68

Source: City of Everett

Everett expects that wholesale rates will increase by 20 percent within the next 12 months.[4] In addition, Everett purchased water rights from the former Weyerhaeuser mill site that will be used to develop the Snohomish River Regional Water Authority. The authority will provide whole water service to Northshore and Woodinville which are both currently served by Seattle. The authority is currently working on developing proposed wholesale rates.

Tacoma Public Utility

Tacoma's annual wholesale water sales are small in comparison to Seattle and Everett. The municipality provides wholesale water to 11 customers. Average wholesale water distribution represents approximately 2 percent, or 2.47 MGD, of Tacoma total water supply. The Simpson Tacoma Kraft Mill, a subsidiary of Simpson Paper Company, is Tacoma's larges industrial water customer and is serviced separately from the wholesale customers. The mill uses approximately 34 percent of Tacoma's daily water supply. Tacoma would have surplus water if the mill were idled or production was reduced. Tacoma could use that water to supply additional wholesale customers.

Table 8
Tacoma Public Utility Wholesale Customers

• Andrain Water Association	• Mt. Lane Terrace
• Cumberland Water Cooperative	• Curran Road Water District
• City of Enumclaw	• City of Fife
• Firgrove Mutual Inc.	• Lakehaven Utilty District
• Shady Haven Mobile Park	• City of Puyallup
• Valley Water District	

Source: City of Tacoma

Wholesale water rates charged by Tacoma vary depending on the season of use and peaking periods. In 1999, the city conducted a review and adjustment to its wholesale water rates. Table 9 provides the wholesale water rates charged by Tacoma. Wholesale rate ranges from $0.785 per ccf during the winter and $0.845 per ccf during the summer with a summer peaking charge of $1.587 per ccf. In addition, system development charges are assessed as a one time fee. The development charge is not reflected in the wholesale rates listed in the table.

[4] Jim Miller, City of Everett. Personal Communication. September 29, 2003.

Table 9
Tacoma Public Utility Wholesale Water Rates

Constant Customer Use	$/ccf/YR
October – May	$0.785
June – September	$0.845
Summer Season, Peaking	
June – September	$1.587

In addition, the city has a commercial and industrial rate schedule for large volume users. These rates vary based on the location of delivery. These rates are of particular interest since one of Tacoma's largest single demands is the Simpson Tacoma Kraft Mill. A large industrial uses represent a potential customer base for a commercially operated regional water supply system. The industrial rates charged by Tacoma for large volume demands range from $0.465 to $0.558 per ccf.

Puget Sound Wholesale Rate Comparison

Wholesale rates varied across wholesale providers and were determined based on a number of different factors. In general, however, water rates are relatively close across the three primary wholesale water providers. Wholesale base rates ranged from $0.62 to $1.68 per ccf. Base rates during nonpeak periods generally range from $0.62 to $0.72 per ccf. These rates represent a one time purchase of water, which is equivalent to an annual lease rate. Table 10 summarizes regional wholesale rates. For comparison purposes, wholesale rates are converted to a price per acre-foot for an annual and permanent basis.[5]

[5] The permanent price was calculated based on a 6% interest rate over a 25 year period. These were the same terms used to capitalize the unit prices calculated for the alternative water supply project costs.

Table 10
Puget Sound Regional Wholesale Water Rate Comparison

	$/ccf/yr	$/aft Annualized	$/aft Capitalized
Seattle			
Off Peak Usage (Sept. 16 – May 15)	$0.72	$328.03	$4,193.35
Peak Usage (May 16 – Sept. 15)	$1.10	$501.16	$6,406.51
Growth Charge	$0.60	$273.36	$3,494.46
Everett			
East of Snohomish River	$0.66	$300.70	$3,843.90
West of Snohomish River-nonpumped	$0.62	$282.47	$3,610.94
West of Snohomish River-pumped	$1.13	$514.83	$6,581.23
Less than 100 Customers	$1.68	$765.41	$9,784.48
Tacoma			
Constant Customer Use			
October – May	$0.785	$357.65	$4,571.92
June – September	$0.982	$447.40	$5,719.26
Summer Season, Peaking			
June – September	$1.16	$723.00	$9,242.00

Municipal Water Right Values in West Coast Regions

Several regions across the west coast of the United States are experiencing similar water demand and supply issues that are faced in the Puget Sound Region. Water right purchases are occurring to develop and expand both local and regional water supply systems. The San Francisco – Bay area and the greater Portland Metropolitan area are two regions where water right purchases are occurring. These metropolitan areas have similar economic, climatic, and water supply issues.

Recent water right purchase for municipal, commercial and industrial uses in The San Francisco – Bay area and the greater Portland Metropolitan area are reviewed to provide a comparison to both the cost of alternative water supplies and recent water right sales in the Puget Sound Region. Table 11 summarizes market transactions in the two areas. Transactional information was obtained by WestWater Research in preparation for the client reports on projects located in both areas.

Table 11
West Coast Water Right Sales

Area	Ave. Price ($/AFT)	Price Range ($/AFT)		No. Transactions
		Low	High	
Bay Area, CA	$1,500	$500	$2500	20
Portland Area, OR	$914	$153	$2,014	13

Source: WestWater Research

Water transactions in the Bay area are more frequent than in the Portland area. Twenty major transactions were recorded within the last 5 years in the Bay area. In contrast, only 13 transactions were identified over the last 15 years. However, over half of the recorded transactions in the Portland area have occurred within the last 3 years. The majority of the Portland area trades involved relatively small quantities of water ranging from a few acre-feet to 2,000 acre-feet. However, a municipal water district located south of Portland is currently negotiating a water right sale that involves up to 44,800 acre-feet. That water right has been valued at between $600 to $1,200 per acre-foot.

Water right sales in the Bay area typically involve large volumes of waters with transaction quantities ranging from 1,000 to 200,000 acre-feet. Buyers within the market include local and regional water purveyors as well as property developers. Currently, the City of San Francisco has issued a request for proposals for water supply contracts to develop dry year options supplies. The proposals can include both temporary and permanent water supply options. Essentially, the city must purchase raw water supplies to meet future water demands. In general, prices within the region have been steadily increasing.

Puget Sound Source Water Right Purchases

Pierce County and Lakehaven Water District are independently examining and attempting to develop a regional water supply system. Both entities have purchased water rights in the process of developing a regional water supply system.

Pierce County/Lone Star Northwest Water Right Acquisition

Pierce County acquired property in 1992 from Lone Star Northwest, Inc. for future expansion of the county's regional wastewater facility. The acquisition also included water rights totaling approximately 15,754 acre-feet (21.8 MGD). Pierce County would later learn that only a portion of those rights were transferable for municipal use.

In 1994, Pierce County filed a change of use application with the Washington Department of Ecology to convert the water rights from industrial to municipal use. The county is currently examining the feasibility of using the water rights to supply the Chambers Creek area as well as a potential to market the water as a wholesale water supply.

Pierce County conducted a study in 1998 to evaluate alternative supply development and deliver scenarios. The study estimated that the value of the water rights was $4.0

million or $253 per acre-foot based on a transferable quantity of 15,754 acre-feet. It is unclear how that price was determined. In addition, the full quantity of the water rights is not transferable.

At the time of the study, Ecology had not issued a decision on the water right transfer. Ecology recently issued a final order in July 2001 approving 2,924.5 acre-feet for two of the rights. Pierce County has elected to relinquish one the water rights for 2410 acre-feet and has indefinitely withdrawn its request to modify two other water rights totaling 2154.6 acre-feet.

The Pierce County Chambers Creek project was identified in the 17 major water supply alternatives. However, the cost associated with obtaining the water rights was not included in the overall project costs. However, the 1998 study estimated a wholesale water rate of $0.68 to $0.71 per ccf. These rates included capital costs, a 7 percent return on investment, and a $4.0 million water right cost.

Lakehaven/Abitibi Water Right Acquisition

Lakehaven Water District is currently in negotiations with Abitibi Consolidated Inc for the purchase of water rights associated with the company's Stielacoom paper mill. This transaction was identified in the memo issued by WestWater Research on August 5, 2003.At this time, limited information is available on how Lakehaven proposes to develop the water rights. However, the proposed sale price is $3.6 million for approximately 6,725 acre-feet of water (6 MGD). The estimated unit price is $535 per acre-foot.

Conclusion and Recommendation

This analysis reviews the cost of alternative water supplies within the Puget Sound Region. Project costs associated with new source development and regional wholesale water rates were reviewed.

- The average unit price for alternative water supply projects within the Puget Sound Region was $4,516 per acre-foot.
- The capitalized value of wholesale water rates within the region ranged from $3,494 to $6,779 per acre-foot.
- The estimated capital costs for developing the Lake Tapps water right to serve as a regional water supply range from $2,723 to $5,075 per acre-foot.

The cost replacement approach has inherent limitations in valuing water rights used for municipal purposes. The project costs and wholesale water rights represent the cost of services for treated and delivered water. The Replacement Cost Approach attempts to extrapolate from those costs and charges to identify a value for a water right, which represents a raw water source. In addition, the project costs and wholesale rates typically do not include a cost for sourcing water. Water rights are

treated as an imbedded asset and not typically valued for rate making purposes. Therefore, a direct comparison of project costs and wholesale rates to water right values is limited.

Capital costs have been estimated for developing the Lake Tapps water right into a regional water supply. In general those development costs are below the average unit price identified proposed projects within the Puget Sound Region. Therefore, the value attributable to the Lake Tapps water right can be estimated based on the difference between the Lake Tapps capital costs and the capital costs for alternative water supplies. Additional analysis is necessary to fully evaluate phased development costs associated with the Lake Tapps Project.

Market Valuation of Water Rights in Western Washington

October 27, 2003

WestWater's Experience
Clients-Private Sector

- **Water Supply Industry:**
  - Oak Lodge Municipal Water District, OR
  - Semitropic Water District
  - Port of Umatilla, OR
  - Pikes Peak Water
  - Ellicott Springs Resources
- **Energy sector:**
  - Tractebel Power
  - Chehalis Power
  - PacifiCorp
  - Marin Coal
  - Silver Eagle Oil Refineries
  - Magnum Hunter Resources
- **Law Firms:**
  - Schwabe Williamson & Wyatt
  - Josephson & Dringman
  - Preston Gates & Ellis
  - Perkins Coie
- **Property Developers:**
  - Davis Properties Inc.
  - Arizona Recreation Facilities
  - Access Golf

WestWater's Experience
Clients-Public Sector

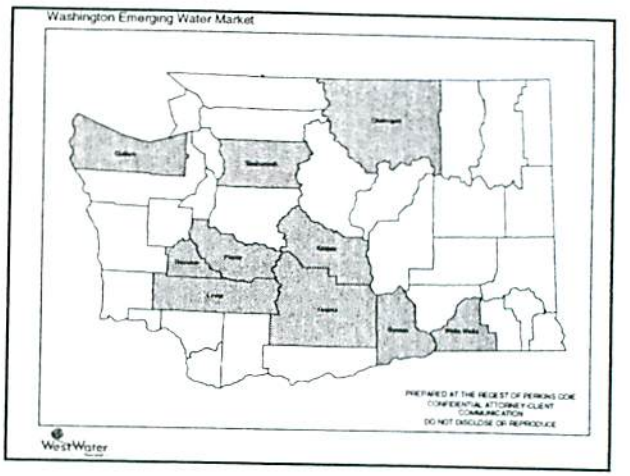
- **Federal Government**
  - Bonneville Power Administration
  - US Bureau of Reclamation
  - National Park Service
  - Natural Resources Conservation Service
- **State Governments**
  - Washington Dept. of Ecology
  - Oregon State Parks
  - Oregon Watershed Enhancement Board
  - Texas Parks
  - Hawaii Board of Land & Natural Resources
- **Nonprofit Organizations**
  - Texas Public Policy Foundation
  - National Fish & Wildlife Foundation
  - Oregon Water Trust
  - Mile High Conservation District
  - Sand County Foundation
  - York Foundation

WestWater's Experience
Washington Projects

- Dungeness Basin Water Valuation
  - Client: Washington Department of Ecology
- Wapatox Water Right Valuation
  - Client: USBR
- Chehalis Water Rights Purchase
  - Client: Chehalis Power Generation
- Flower Ditch Water Rights Valuation
  - Client: Washington Department of Ecology
- Sammamish River Water Right Purchase
  - Client: Property Developer
- Southern Puget Sound Water Rights Mapping
  - The Water Companies, LLC

Summary of Lake Tapps Water

- PSE's prior water rights based on a claim dating back to 1895 to Divert 2,000 cfs from White River
- Ecology issued report of examination for consumptive and storage of 72,400 aft for municipal water use



Washington Water Market Overview

- Emerging Market Areas
- Market is thinly traded
- Limited number of transactions
- Few large transactions
- Market prices trade on a $/acre-feet (aft)
  - 1 MGD equal to 1,120 acre-feet per year

Western Washington Market Participants

Buyers

- Municipalities
- Private Water Purveyors
- Golf Courses
- Real Estate Development
- Energy Facilities

Sellers

- Industrial Facilities
- Irrigation Rights
- Water Purveyors

Central & Eastern Washington

Market Participants

Buyers	Sellers
• US Bureau Reclamation	• Agricultural Producers
• Department of Ecology	• Property Development
• Trend West	• Pulp and Paper
• Quad Cities	• Energy Facilities
• Energy Facilities	

Comparable Sales Approach

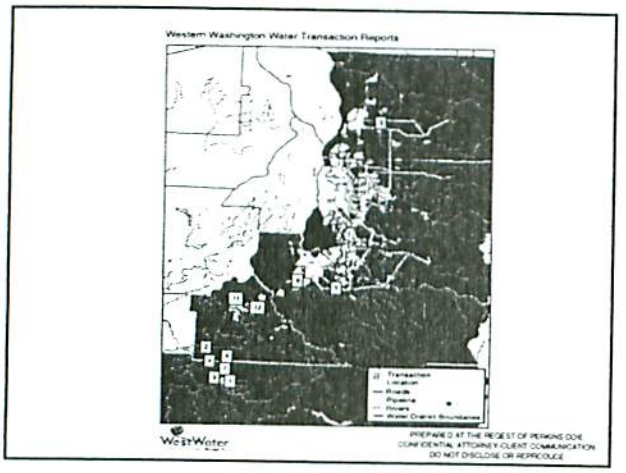
- Compares the subject water rights with similar water rights that have been sold or leased.
  - Requires sufficient transactions to provide accurate comparisons
  - Additional valuation techniques recommended when sales information is limited.
- Comparable Sales Valuation Challenge for Lake Tapps
  - Large transactions size
  - Regional Water Supply Source
  - Unique water right

Valuation Approach Lake Tapps Water Right

- Comparable Sales
- Replacement Costs/Avoided Costs
- Income Capitalization

Western Washington Transactions

- 12 transactions identified between 1996-2003
- Majority of transactions occurred between 2000-2003
- Transactions located in Southern Puget Sound area
- Small volumes of water
- Municipal and Domestic use is the principle buyer
- One transaction excluded Distressed Sale



Summary of Findings

- 11 transactions reviewed that were considered arms length and non-stressed sales
  - Price Range: $535 to $3,337/aft
  - Median Value: $900/aft
  - Average Value: $1,286/aft
  - Transaction size: 52 aft-6,725 aft
- Limited number of sales comparable to size of Lake Tapps water right
- Recommend using alternative approaches to reconcile and validate comparable sales range.

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Western Washington Transaction Summary

Summary of Comparable Sales

Ref #	Year	Seller	Buyer	Total Price	Quantity (AF)	$/AF Cap Rate
1	1998	Irrigation	Municipal	$ 10,000.00	8	$ 1,250.00
1	1998	Irrigation	Municipal	$ 50,000.00	40	$ 1,250.00
3	1996	Industrial	Municipal	$ 1,360,000.00	26,565	$ 51.20
4	N/A	Irrigation	Municipal	$ 67,200.00	84	$ 800.00
5	2000	Domestic	Municipal	$ 570,627.00	171	$ 3,337.00
6	2003	Irrigation	Mitigation	$ 95,400.00	106	$ 900.00
7	2002	Sand & Gravel	Mitigation	$ 42,400.00	53	$ 800.00
8	2002	Industrial	Municipal	$ 3,600,000.00	6,725	$ 535.29
9	1996	Irrigation	Municipal	$ 20,000.00	30	$ 666.00
10	1998	Irrigation	Municipal	$ 30,000.00	33	$ 909.00
11	2003	Industrial	Municipal	$ 405,000.00	450	$ 900.00
12	2003	Irrigation	Municipal	$ 112,000.00	40	$ 2,800.00

Regional Market Comparisons

- **San Francisco Bay Area**
  - Trades Dominated by Municipal Water Purveyors
  - Large Volume Trades
    - Transaction Volume: 1,000 to 200,000 AFT
  - Prices Steadily Increasing
  - Market Price Summary
    - Average Price: $1,200 to $1,500/AFT
    - Low Price: $500/AFT
    - High Price: $2,500/AFT
- **Willamette Basin, Oregon**
  - Trades Dominated by Municipal/Domestic Buyers
  - Increasing Trading Activity within Last 5 Years
  - 13 Transactions Recorded in Over 15 Year Period
  - Market Price Summary
    - Average Price $914/AFT
    - Minimum Price: $153/AFT
    - Maximum Price: $2,014/AFT

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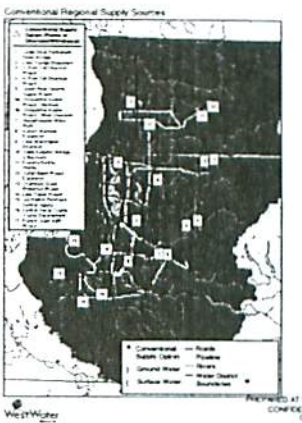
Avoided Cost/ Replacement Cost Approach

- Estimates value based on the current cost of reproducing or replacing an equivalent quantity of water.
  - Commonly used in areas where water rights are limited and the market price for water is dominated by investment alternatives.
  - Used if information from comparable sales and income capitalization approaches is limited.
- Projects Reviewed
  - New Source Development
  - Wholesale Water Purveyors



New Source Development

- Project Costs for 17 major water supply projects
  - Development of New Ground and Surface sources
  - Expansion existing sources
  - Reservoir Expansion and ASR

Comparative Cost of New Projects

Cost Comparison Assumptions

- Accuracy of Project Costs
  - O&M Costs
  - Capital Costs
- Water Rights & Water Source Costs
- Unit Cost Based on Firm Yield Quantity
- Project Costs Do Not Reflect Transmission Capital Cost to CWA Service Area

New Project Summary

Project Costs ($2002)

Lake Tapps Project: Alternative 1	64.6	$142	$4.19	$2,208,573	$1,969
Lake Tapps Project: Alternative 2	64.4	$160	$4.10	$2,479,257	$2,213
Lake Tapps Project: Alternative 3	64.6	$185	$4.40	$2,994,427	$2,673
Lake Tapps Project: Alternative 4	64.6	$246	$5.19	$3,831,579	$3,421
Lake Tapps Project: CWA Phase Develop.	64.6	$270	$7.66	$4,178,587	$3,731
Sultan Basin Expansion	64	$303	$4.70	$4,728,750	$4,222
Green River Second Supply	46	$237	$5.60	$5,276,367	$4,711
North Fork Tolt Diversion	40	$115	$1.26	$2,840,000	$2,577
Cedar Dead Storage	30	$22	$0.57	$667,303	$499
OASIS ASR Project	25.6	$116	$1.80	$4,537,402	$4,051
Weyerhaeuser Water Right	23.7	$166	$2.46	$7,021,087	$6,269
Everett/SPU Intertie	20	$158	$1.00	$7,944,000	$7,067
Lake Youngs Drawdown	20	$205	$2.37	$10,244,000	$9,146
Snoqualmie Aquifer	16	$81	$0.79	$5,063,500	$4,521
Chambers Creek Properties Project	14	$41	$0.79	$2,918,429	$2,607
South Fork Tolt Additional Drawdown	6	$15	$0.46	$1,937,000	$1,729
Lake Washington Withdrawal	8	$24	$0.60	$2,938,500	$2,623
Central Pierce County Source Development	3	$4	$0.06	$862,000	$763

Wholesale Rate Comparison

Puget Sound Regional Wholesale Water Rate Comparison

	$/ccf/yr	$/aft Annualized	$/aft Capitalized
Seattle			
Off Peak Usage (Sept. 16 – May 15)	$0.72	$328.03	$4,193.35
Peak Usage (May 16 – Sept. 15)	$1.10	$501.16	$6,406.51
Growth Charge	$0.60	$273.36	$3,494.46
Everett			
East of Snohomish River	$0.66	$300.70	$3,843.90
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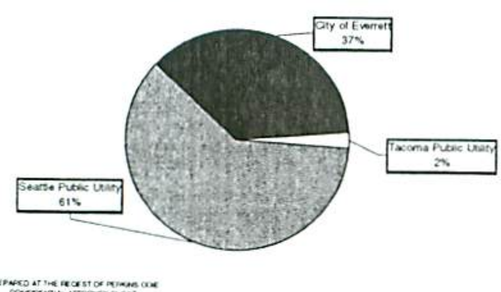
West of Snohomish River-pumped	$1.13	$514.83	$6,581.23
Less than 100 Customers	$1.68	$765.41	$9,784.48
Tacoma			
Constant Customer Use			
October – May	$0.785	$357.65	$4,571.92
June – September	$0.982	$447.40	$5,719.26
Summer Season, Peaking			
June – September	$1.16	$723.00	$9,242.00

Puget Sound Wholesale Water

Total Annual Wholesale Volume 109 MGD



Large Scale Water Projects

Cost Comparison $/aft Capitalized

Lake Tapps Capital Costs	64.6	$1,969	$2,213	$2,673	$3,421	$3,731
Sultan Basin Expansion	64	$4,222	$4,222	$4,222	$4,222	$4,222
Differential		*$2,253*	*$2,009*	*$1,549*	*$801*	*$491*
Green River Second Supply	46	$4,710	$4,710	$4,710	$4,710	$4,710
Differential		*$2,741*	*$2,497*	*$2,037*	*$1,289*	*$979*
Weyerhaeuser Water Right	24	$6,269	$6,269	$6,269	$6,269	$6,269
Differential		*$4,300*	*$4,056*	*$3,596*	*$2,848*	*$2,538*
Seattle Weighted Average Rate	-	$4,920	$4,920	$4,920	$4,920	$4,920
Differential		*$2,950*	*$2,706*	*$2,246*	*$1,498*	*$1,188*

Final Reconciliation of Value

- Comparable Sales Summary
  - Price Range: $535 to $3,337/AFT
  - Average Price: $1,286/AFT
  - Median Price: $900/AFT
  - Small Transaction Volumes
- New Water Supply Options
  - Cost Range: $498 to $9,146/AFT
  - Average Unit Cost: $3,904
  - Large Projects have High Capital Costs
    - Sultan Basin: $4,222/AFT
    - Green River SS: $4,710/AFT
    - Weyerhaeuser Right: $6,269/AFT
  - Projects Do Not Include a Source Water Charge
  - Capital and O&M Costs Significantly Higher then Raw Water Costs
- Regional Wholesale Water Costs
  - Price Range: $3,610 to $9,784/AFT - Capitalized
  - Limited Future Development
  - Anticipated Future Rate Increases

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Final Reconciliation of Value

- Lake Tapps Water Right Value
  - Based on Comparable Sales
    - Value Range: $65 to $95.4 million
  - Based on Avoided Cost – New Project Cost Differential
    - Value Range: $35* to $331 million
  - Based on Wholesale Rates – Seattle Cost Differential
    - Value Range: $86 to $214 million
- Water Right Comparables Representative of Raw Water Source Costs
  - Water Right Prices Similar to Other Regional Market Price Ranges.
  - Comparable Sales are Representative of Water Right Prices in Puget Sound Region.
  - Capital Cost Differentials Between Lake Tapps and Alternative New Source Projects consistent with water right comparable price range.

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WestWater Research LLC
121 Grand Avenue, Suite 222
Laramie, WY 82070

Memorandum

To: Bruce Dick

From: Clay Landry, Andrea Larsen

Date: April 8, 2004

Subject: Revised Model Rate Assumptions and Analysis

Purpose

This memorandum provides an update on the cost comparison analysis of the Cascade Water Authority (CWA) supply options. WestWater Research developed a rate model based on the preliminary model provided by Puget Sound Energy, the original printed documentation of CWA's model, and revised assumptions of CWA's model. The model developed by WestWater provides a flexible mechanism for evaluating alternative payment structures for the Lake Tapps water right.

The primary assumptions used to develop the model are described in this memorandum. The model is intended to replicate the CWA rate forecast and draws upon dates and cost values from the CWA model. Therefore, all data has been supplied by the CWA model unless otherwise noted.

The model created by WestWater is used to evaluate several payment scenarios. The objective is to determine the effects that a water right purchase price of $75 million would have on CWA's immediate and long-term customer rates. The goal of the scenario analysis is to identify a payment structure for the water right that keeps CWA's customer at a level that is comparable to rates if CWA continued to source water from Seattle Public Utilities (SPU).

Model Assumptions

The first sheet in the model contains the assumptions. All assumptions that are built into the model are coded in blue.

Water Demand

The total CWA water demand is the quantity identified by the CWA model required to service their customers through 2050. While the CWA model identifies specific demand for each wholesale customer, the WestWater model has inputted the total of all wholesale customers as the water demand. Overall, the CWA water demand continues to increase over the model term. However, the growth rates vary over the years as indicated below.

- Between 2004-2005, the growth rate is 2.61 % and gradually decreases to a rate of 2.26% between 2010-2011.
- Between 2011-2012, the growth rate increases to 3.02 % and then gradually decreases to a rate of 2.43% between 2019-2020.
- Between 2020-2021, the growth rate drops to 1.14 % and gradually decreases to a rate of 1.04% between 2029-2030.
- Between 2030-2031, the growth rate increases to 1.12 % and gradually decreases to a rate of 0.92% between 2049-2050.

Lake Tapps: Water Supply

The water quantity produced by the Lake Tapps Project is based on the figures given in the CWA model. It is assumed that these numbers correspond with the HDR engineering reports.

- 2004-2021—0 million ccf
- 2022-2031—16 million ccf
- 2032-2050—32 million ccf

Lake Tapps: Water Right Purchase

The original CWA model assumes a total purchase price of $24 million for the Lake Tapps water right with an initial payment of $3.1 million and the remaining $21 million paid in fourteen increments of $1.5 million from 2004-2017 with no adjustment for inflation.

However, WestWater Research has valued the Lake Tapps water right at $65 to $95.4 million.[1] The revised CWA assumptions include a $75 million payment over four years (2028-2031) for additional transmission costs. This analysis assumes that this cost is associated with the purchase of the Lake Tapps water right. The cost is assumed to be inflated by CPI similar to other costs. However, the revised documentation does not show the payment schedule past 2025 so this assumption could not be confirmed.

[1] Landry, Clay. Memorandum to Bruce Dick, Perkins Coie. Draft Report: Water Market Consultation Report for Western Washington. August 5, 2003.

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WestWater Research has incorporated mechanisms in the model to increase the total purchase price and divided the payment schedule into five separate phases:

- an initial upfront payment,
- pre-construction payments,
- phase 1 construction payments,
- phase 2 construction payments, and
- post-construction payments.

The WestWater Model assumes the total present value (PV) of the water rights to be $75 million. The payments are allocated over the five phases so that the net total present value of total payments of the water right equals $75 million. Payments are inflated based on the bond rate to include the cost of financing at the time of payment. This assumption may be revised based on discussions with Puget Sound Energy.

CWA Model Scenario (CWA): Provides a base case for the CWA cost estimates. This scenario assumes a water right purchase price of **$75 million** paid out between 2028 and 2031 during phase 2 construction.

- Initial Upfront Payment: $0 in 2004
- Pre-construction Payments: $0 from 2004-2017
- Phase 1 Construction Payments: $0 from 2018-2027
- Phase 2 Construction Payments: $18.75 million from 2028-2031
- Post-construction Payments: $0 from 2032-2050

WestWater Model Scenario (WWR): This scenario assumes a water right purchase price of **$75 million** with payments beginning in 2004 and paid out by 2050.

- Initial Upfront Payment: $3 million in 2004
- Pre-construction Payments: $1.7 million increased by CPI from 2004-2017
- Phase 1 Construction Payments: $0.75 million increased by CPI from 2018-2027
- Phase 2 Construction Payments: $0.75 million increased by CPI from 2028-2031
- Post-construction Payments: $2.1 million increased by CPI from 2032-2050

Lake Tapps: Development Capital Expenditures

The capital expenditures associated with the Lake Tapps Projects in the WestWater model are based on data provided in the revised CWA documentation. The Lake Tapps water supply will be constructed in two phases.

Costs in the first phase include the following:

- Planning and engineering costs for Lake Tapps, its transmission, and the Tacoma-Eastside transmission line in 2003 and 2004 (PV of $3,602,500)
- Construction costs of the Issaquah Pipeline in 2004 (PV of $13,000,000)
- Department of Energy Source Exchange Study in 2005 (PV of $150,000)

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- Construction costs of the Tacoma-Eastside Transmission Line (south segment) between 2005 and 2008 (PV of $41,200,000)
- Construction costs of the Tacoma-Eastside Transmission Line (north segment) between 2018 and 2021 (PV of $57,680,000)
- Construction costs of Lake Tapps Transmission to TSSP between 2018 and 2021 (PV of $70,040,000)
- Construction costs Lake Tapps between 2018 and 2021 (PV of $82,400,000)

Costs in the second phase include the following:

- Construction costs Lake Tapps TP between 2028 and 2031 (PV of $54,899,000)

The capital costs given in the HDR engineering report are based on the expenditure requirements in 2004. Therefore, the costs must be inflated to actual cost during the years incurred. The WestWater model bases its inflation rate of the CWA model assumption that the values should be escalated by a Consumer Price Index (CPI) of 3 percent.

The WestWater model assumes the capital costs associated with the Lake Tapps water supply have been accurately projected by HDR and incorporated accurately into the CWA model.

Lake Tapps: Bond Financing

Puget Sound Energy may issue bonds to CWA to finance the purchase of the water rights and the construction of the Lake Tapps facilities. The CWA model does not consider the financial effects of this bond issuance. However, the bond financing component has been added to the WestWater model. Puget Sound Energy must receive a 5 percent rate of return on the bond. Therefore, the cost of financing the bond increases the total bond by 5 percent.

Lake Tapps: Annual Operating Expenses

The operating expenses associated with the Lake Tapps project in the WestWater model are based on data provided in the CWA model. The model assumes operating costs are associated with the following aspects of the Lake Tapps project:

- Conservation measures beginning in 2004 at $250,000
- Issaquah Pipeline beginning in 2004 at $104,000
- Tacoma-Eastside Transmission-Line (south segment) beginning in 2009 at $531,306
- Tacoma-Eastside Transmission Line (north segment) beginning in 2022 at $877,770
- Lake Tapps transmission to TSSP beginning in 2022 at $1,141,101
- Lake Tapps Phase 1 beginning in 2022 at $4,866,903
- Lake Tapps Phase 2 beginning in 2032 at $3,270,355

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The CWA and the WestWater models escalate the values annually by a CPI of 3 percent.

The model assumes the operating costs associated with the Lake Tapps water supply have been accurately projected by HDR and incorporated accurately into the CWA model.

Seattle Public Utilities: Water Supply

The total supply provided by the existing Seattle Public Utilities (SPU) system is based upon the quantity provided in the CWA model. The average annual, low firm yield of the current system is 171 million gallons per day (mgd).

The WestWater model has been developed to run a scenario where the SPU constructs the Green River Second Supply project. Under the additional supply scenario, the total supply is increased to an average annual, low firm yield of 211 mgd in 2022.[2]

A portion of the total SPU supply is provided to the CWA Block. The model developed by CWA assumes that the quantity of water purchased from SPU begins to decrease in 2024 as a result of Lake Tapps coming online. The WestWater model bases its decrease of CWA Block on the values given in the CWA model. The SPU water supply assumptions associated with the development of the Lake Tapps supply are the following:

- 2004-2023—15 million ccf or 30.3 mgd
- 2024-2029—12 million ccf or 25.3 mgd
- 2030-2034—10 million ccf or 20.3 mgd
- 2035-2039—7 million ccf or 15.3 mgd
- 2040-2044—5 million ccf or 10.3 mgd
- 2045-2050—3 million ccf or 5.3 mgd

In addition, the WestWater model includes the option for CWA to buy only SPU and Tacoma water and to not purchase the Lake Tapps water right or incur construct costs associated with infrastructure. Under this option, the CWA Block is kept constant at 15 million ccf or 30.3 mgd.

Under the option of complete reliance on SPU water, the WestWater model can increase the CWA Block based on the implementation of the Green River Second Supply project. The increase under this project assumes that all of the supply from the project is provided to the CWA Block, increasing the total SPU water supply to 34 million ccf or 70.3 mgd in 2022.

[2] Landry, Clay. Memorandum to Kyle Branum, Perkins Coie. Regional Alternative Supply Valuation Analysis. October 3, 2003

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Seattle Public Utilities: Rate Calculation

The SPU wholesale rates are based on two classes of assets. Each category has separate procedures for calculating the rates incurred by the SPU customers.[3]

- Class I—existing facilities and future improvement to these facilities
- Class II—new facilities required to expand the system (e.g., new supply sources)

Class I Assets

For Class I assets, the SPU rate in the WestWater model is based on the information in the CWA model. The CWA model assumes the rate calculation is the summation of three components for supply and transmission projects:

- Component One: Asset Base * Rate of Return * Percentage of Use
- Component Two: Asset Depreciation * Percentage of Use
- Component Three: Operation & Maintenance Expenses * Percentage of Use

The most significant factor affecting the Class I wholesale rates is the assumption of SPU's asset base for supply and transmission. The asset base is used to determine the return on asset, asset depreciation, and operation & maintenance costs. These costs are distributed to CWA based on its proportion of water use. If the asset base increases, so would the rates.

The WestWater model assumes that the figures included in the CWA model for the SPU asset base are accurate. However, there are uncertainties associated with the SPU's asset base assumptions. For example, it is likely that SPU rates will increase as new supply projects are constructed. The WestWater model includes the option of having the SPU develop the Green River Second Supply project. The capital and operating costs associated with the Green River Second Supply project are included as Class II assets.

The asset values from the CWA model vary of over the model term. The variations are indicated below for both supply assets and transmission assets

Supply Assets

The value of the assets usually decreases gradually in accordance with depreciation of assets until a new improvement project is implementation which increases the asset value.

The significant rate increases over the last ten years are due to major capital improvement projects by SPU. The largest component of the previous capital improvement was the construction of the Cedar Treatment Plant. SPU issued bonds to finance the Cedar Treatment Plant about 10 years ago. Construction should be completed in one year, and the bonds repaid within ten years. After repayment of the bonds, the costs to SPU would

[3] Allen, Jerry, Deputy Finance Director, Seattle Public Utilities. Personal Correspondence. December 4, 2003.

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decrease. However, the rates would not decrease, and the difference between rates and costs would be available for funding capacity.[4]

The projected supply assets incorporated into the WestWater model are based on the CWA model data. These supply assets:

- Begin at $363 million in 2004 and decrease to $357 million in 2005
- Increase by $19.4 million in 2006 to $376 million
- Decrease steadily from 2007 to 2025 reaching $191 million
- Increase by 2 percent annually after 2025 reaching $314 million in 2050

If no new improvement projects are implemented, asset depreciation is relatively constant over the asset life. Therefore, the supply asset depreciation generally decreases slightly between 2006 and 2025 since no new improvements are proposed, and then increases between 2026 and 2050 due to the 2 percent annual increase in the supply asset base.

The operation and maintenance costs remain relatively constant with increases due to inflation. The supply operation and maintenance costs begin at $22 million in 2004 and continually increase until reaching $66 million in 2050.

Transmission Assets

The transmission assets are more inconsistent than the supply assets. Over the 22 year period between 2004 and 2025, the transmission asset base increases in 14 years. These increases suggest that many improvement projects are planned for the transmission assets. During this time period, the value of the transmission assets is lowest in 2007 at $281 million and reaches a peak in 2025 at $460 million. After 2025, the transmission assets are projected to increase by 2 percent annually reaching $754 million in 2050.

The amount of depreciation increases as the asset base increases with improvement projects. The transmission asset depreciation increases in most years due to the continual improvement projects.

The operation and maintenance costs remain relatively constant with increases due to inflation. The transmission operation and maintenance costs begin at $5 million in 2004 and continually increase until reaching $15 million in 2050.

Other Factors

SPU requires a rate of return on its assets of 6.90 percent. It is likely that SPU could change its required rate of return on assets. The WestWater model includes the option of changing the rate of return to 10 percent. This increase will increase the SPU wholesale rate.

[4] Allen, Jerry, Deputy Finance Director, Seattle Public Utilities. Personal Correspondence. November 20, 2003.

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The CWA percentage of use varies under the scenarios which include the development of Lake Tapps Supply, reliance on SPU supply under current system, and reliance on SPU supply with the development of Green River Second Supply. The percentages under each scenario are shown below.

Development of Lake Tapps Supply

- 2004-2023—30.3 mgd or 18% of total SPU supply
- 2024-2029—25.3 mgd or 15% of total SPU supply
- 2030-2034—20.3 mgd or 12% of total SPU supply
- 2035-2039—15.3 mgd or 9% of total SPU supply
- 2040-2044—10.3 mgd or 6% of total SPU supply
- 2045-2050—5.3 mgd or 3% of total SPU supply

Reliance on SPU Supply under Current System

- 2004-2050—30.3 mgd or 18% of total SPU supply

Reliance on SPU Supply with the Development of Green River Second Supply

- 2004-2021—30.3 mgd or 18% of total SPU supply
- 2022-2050—70.3 mgd or 33% of total SPU supply

In addition to the prorated costs associated with the asset base, asset depreciation, and asset operation & maintenance expenses, CWA is charged constant fees entitled sub-regional system costs. The total of these costs is an annual fee of $150,000. These fees are not inflated over the model term, according to the CWA model.

Class II Assets

For Class II assets, the rate is calculated by two payment structures. A one-time upfront payment recovers the capital expenditures, while an annual fee is charged to recover the on-going annual operating expenses.

Capital Expenses

The capital costs are recovered through connection fees based on the number of ERUs. The number of ERUs is based on the size of the connection pipe, but basically accounts for new customers. Therefore, the capital costs are distributed only among new users.

The ERU Fee is calculated by the dividing the annual debt service payment by the new ERUs. The total capital expenditure is the cost to develop the project. Seattle's average cost of debt is assumed to be the interest rate. The term required to finance the new facility is the lesser of the facility life or the period over which new demand will fully utilize the facility's supply.

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The Green River Second Supply project would be considered a Class II asset. The capital expenses would result in the following ERU connection payment.

Capital Expenditure:	$237.34 million[5]
Interest Rate:	6% [6]
Term:	18 years [7]
Annual Payment:	$21.93 million
Capacity (# of ERU):	100,000
ERU % of annual payment:	18/100,000 = 0.018%
ERU Cost:	0.018% * $21.93 million = $3,947

The analysis assumes that CWA would purchase all the capacity since the Green River Second Supply project produces less water than the Lake Tapps Supply project. Therefore, the number of ERUs is irrelevant as CWA would purchase all of the ERUs. The total cost incurred by CWA for new connections would be $394.71 million in Year 2022—the year that a portion of the Lake Tapps water supply would have been available.

Operating Expenses

In contrast to capital expenses, the additional operation and maintenance expenses are shared by all users of the SPU system. Once CWA purchases the ERU connections, then all SPU wholesale customers would incur an increase in their operating expenses. The CWA percentage and operating costs would increase as it would be using the entire new supply. While the other customers would experience a decrease in their percentage of usage, their operating fees would increase due to the overall increase in SPU operating expenses.

This model assumes a total annual operating cost of $48 million in 2004.[8] This annual cost is inflated by CPI over the term of the mode.

Seattle Public Utilities: Variable Penalty Payment

If the CWA uses more water than provided under its block, the CWA must pay a penalty fee for the additional water. The CWA model calculates this penalty fee based on the SPU excess (penalty) block of water use, estimated peak season volume, and estimated

[5] Landry, Clay. Memorandum to Kyle Branum, Perkins Coie. Regional Alternative Supply Valuation Analysis. October 3, 2003.
[6] Seattle Public Utilities. EXHIBIT VI, Calculation of ERUs as a Part of Facilities Charges.
[7] The payment term would be the time period required to supply the full capacity. This model assumes that CWA would purchase the full amount of the Green River Second Supply Project in 18 years which corresponds with Year 2022 when the Lake Tapps supply would be first available.
[8] Landry, Clay. Memorandum to Kyle Branum, Perkins Coie. Regional Alternative Supply Valuation Analysis. October 3, 2003.

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peak month volume. The WestWater model does not perform the calculation, but directly inputs the values calculated in the CWA model as the assumptions. Under the current assumptions, CWA only incurs two variable penalty payments: 1) $0.5 million in 2008 and 2) $2.0 million in 2009.

Tacoma Water Purchases

In addition to the Green River Second Supply project, the WestWater model includes the original water purchases from Tacoma as given in the CWA model. The CWA model assumes that the water deficit experience between 2010 and 2021 will be offset by purchasing water from Tacoma. The Tacoma water purchases are assumed to be 2.1 million ccf in 2010 and continually increase to 6.0 ccf in 2021. The Tacoma water rate is assumed to be $1 per ccf in 2004 and escalated annually by a CPI rate of 3 percent.

In addition, CWA is required to pay SPU wheeling fees to transport the Tacoma water. This payment increases from $0.5 million in 2010 to $0.6 million in 2021.

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Water Right Payment Scenarios

A scenario analysis was conducted using the model created by WestWater Research based on the model provided by Puget Sound Energy and the CWA data. The rates to CWA customers resulting under specific assumptions are compared in this memorandum.

Two major assumptions affect the results of the model. First, the model assumes that the SPU rate is largely calculated by the SPU asset base. The model assumes that the SPU asset base is accurate and does not significantly increase. Second, the model assumes the operating and capital costs associated with the Lake Tapps water supply have been accurately projected by HDR.

The model includes toggles or alternatives that develop the various scenarios discussed in this section. These choices are labeled as "Toggles for Scenarios" on the assumptions sheet in the model. The toggles range from 1 to 3, and a brief description is provided for each assumption associated with the toggle selection. Below is an outline of the toggle settings for the major scenarios evaluated by WestWater Research.

Table 1
Model Toggles for Scenarios

	Lake Tapps Development		Reliance on SPU	
Model Toggles	**CWA**	**WWR**	**Current Supply**	**Green River Second Supply**
SPU Supply	1	1	1	2
CWA Block of SPU Supply	2	2	1	3
SPU Rate of Return	1	1	1	1
CWA Sub-Regional System	1	1	1	1
Lake Tapps Supply Costs	2	2	1	1
Lake Tapps Water Right Payment	1	2	2	2

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Scenario Analysis 1: Payment Structure for Lake Tapps Water Rights

WestWater Research has valued the Lake Tapps water right at $65 to $95.4 million. The revised CWA model assumes a total purchase price of $75 million for the Lake Tapps water right with four payments during phase 2 construction. WestWater Research has developed a model which allows for the variation of the payments in five separate phases:

- an initial upfront payment,
- pre-construction payments,
- phase 1 construction payments,
- phase 2 construction payments, and
- post-construction payments.

Payments are allocated over the five phases so that the net total present value of total payments of the water right equals $75 million. Payments are inflated based on the CPI to adjust for discounting.

CWA Model Scenario (CWA)

This scenario assumes a water right purchase price of **$75 million** paid out between 2028 and 2031 during phase 2 construction.

- Initial Upfront Payment: $0 in 2004
- Pre-construction Payments: $0 from 2004-2017
- Phase 1 Construction Payments: $0 from 2018-2027
- Phase 2 Construction Payments: $18.75 million from 2028-2031
- Post-construction Payments: $0 from 2032-2050

WestWater Model Scenario (WWR):

This scenario assumes a water right purchase price of **$75 million** with payments beginning in 2004 and paid out by 2050.

- Initial Upfront Payment: $3 million in 2004
- Pre-construction Payments: $1.7 million increased by CPI from 2004-2017
- Phase 1 Construction Payments: $0.75 million increased by CPI from 2018-2027
- Phase 2 Construction Payments: $0.75 million increased by CPI from 2028-2031
- Post-construction Payments: $2.1 million increased by CPI from 2032-2050

Scenario Payment Comparison

An initial scenario analysis is shown in Figure 1. The results suggest that changing the payment schedule for the Lake Tapps water rights influences the CWA rate. However, this impact on rates appears to be insignificant. A dramatic drop in cost rates occurs in

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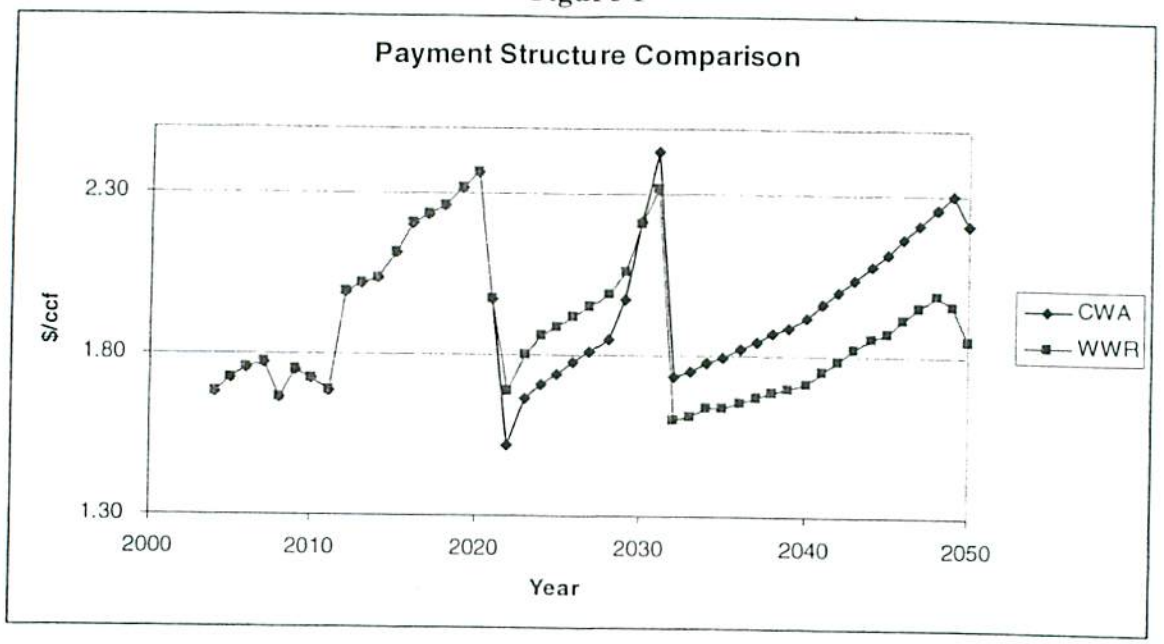
Year 2022 and 2032 when the new Lake Tapps water supply comes on-line and doubles the water supply. The average cost over the 46 year period between 2004-2050 is $1.95 per ccf under CWA Model Scenario and $1.89 per ccf under WWR Model Scenario. These results suggest that the average rates are lower under a longer payment structure.

Figure 1



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Scenario Analysis 2: Water Source Comparison

First, the analysis considers the alternative where CWA purchases and develops the Lake Tapps water right and payments are made according to the WestWater model scenario (WWR). Second, WestWater has developed a scenario that evaluates CWA's customer rates if CWA continues to purchase water from SPU under current supply. Third, a scenario evaluates the effect of increasing SPU supply with the development of the Green River Second Supply project. These three scenarios are outlined below.

WestWater Model Scenario (WWR)

This scenario assumes that the quantity of water that is purchased from SPU begins to decrease in 2024 as a result of Lake Tapps coming online. The CWA block of water from SPU will decrease according to the following schedule:

- 2004-2023—15 million ccf or 30.3 mgd
- 2024-2029—12 million ccf 25.3 mgd
- 2030-2034—10 million ccf or 20.3 mgd
- 2035-2039—7 million ccf or 15.3 mgd
- 2040-2044—5 million ccf or 10.3 mgd
- 2045-2050—3 million ccf or 5.3 mgd

Reliance on SPU Supply Under Current Supply Model Scenario (SPU)

This scenario assumes that CWA buys only SPU water and current available Tacoma water. The Tacoma supply is purchased between 2010 and 2021 to compensate for a supply deficit. Under this scenario, CWA does not purchase the Lake Tapps water right or incur construction costs associated with infrastructure. In addition, SPU does not develop the Green River Second Supply project. The CWA block of water from SPU will remain constant at 15 million ccf or 30.3 mgd.

Reliance on SPU Supply with the Development of Green River Second Supply Model Scenario (GRSS)

Similar to the SPU model, this scenario assumes that 1) CWA buys only SPU water and current available Tacoma water (Tacoma supply is purchased between 2010 and 2021 to compensate for a supply deficit), and 2) CWA does not purchase the Lake Tapps water right or incur construction costs associated with infrastructure. However, this scenario assumes that SPU develops the Green River Second Supply project. The CWA block of water from SPU will increases to 34 million ccf or 70.3 mgd in Year 2022.

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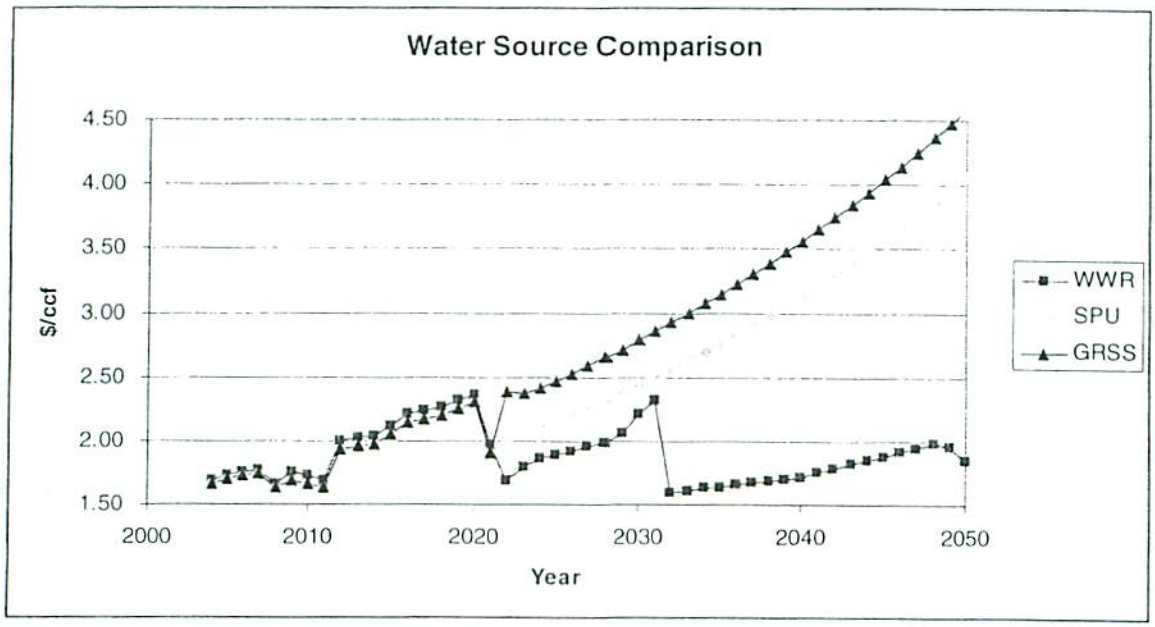
Scenario Source Comparison

Figure 2 shows that the rate in the first years is marginally higher due to the water right payment, but is most directly related to the costs of the SPU and Tacoma water supply. The average cost over the 46 year period between 2004-2050 is $1.89 per ccf under WWR scenario, $2.53 per ccf under SPU scenario, and $2.77 per ccf under GRSS model. These results suggest that the switching from SPU water to Lake Tapps water supply significantly decreases the cost to CWA customers, especially if SPU is required to develop the Green River Second Supply project.

Figure 2



The goal of the analysis is to show the rate changes between continuing use of the SPU water and implementing the Lake Tapps water supply. The most significant factor affecting the SPU water rate is the assumption of its asset base and future water supply projects. This analysis indicates that SPU rate will continue to increase as additional supply projects are required to meet water demand in service area.

Proposed Scenarios

The model develop by WestWater has the capability of evaluating additional scenarios. For example, the SPU rate of return and/or the sub-regional costs could be increased.

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Summary

WestWater Research submits this analysis as a preliminary review of the costs to CWA per ccf under various scenarios. In general, these revised results suggest the following:

1. The average rates paid by CWA customers between 2004 and 2050 would be lower on average under a longer payment structure.
2. CWA could reduce its average customer rates between 2004 and 2050 significantly by purchasing and developing the Lake Tapps water right, especially if SPU is required to develop the Green River Second Supply project.
3. The assumptions which determine the SPU rate have many uncertainties. Most likely, the SPU rate charge to CWA will increase. With a rate increase, the average costs to CWA will also increase, expanding the rate disparity between SPU supply and Lake Tapps water right supply.

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S.W. Beck Info Request

Memorandum

To: Bruce Dick and Kyle Branum, Perkins Coie

From: Clay Landry

Date: May 6, 2004

Subject: RW Beck Information Request

This memo is in response to the informational request submitted by RW Beck regarding the "Market Valuation of Water Rights in Western Washington" that was presented to CWA on October 27, 2003. The following responses correspond with the numbered questions and requests submitted by RW Beck on February 20, 2004.

1. WestWater Research's transactional information is confidential and proprietary. However, in an effort to assist RW Beck, we have provided individual summaries of water right transactions identified within the Puget Sound Region in Attachment A of this memo. Please note that due to the private nature of water right transactions, information such as price and terms is difficult to obtain. WestWater has spent considerable time developing professional contacts and trust to access private water right transactional information. Such information is commonly provided to WestWater by sources that request that certain information, including party names, locations, and water right numbers, be kept confidential. It is necessary for WestWater to maintain and honor those requests and protect such information, and, therefore, specific information related to names and water right numbers has been removed. WestWater Research requests that the information contained in the memo not be disclosed by RW Beck or CWA to third parties.

2. Transaction #3 was excluded from the comparable sales because it was deemed a distress-sale. The water right was owned by an industrial facility that had been closed and was no longer utilizing the water right. The facility was liquidating assets to recover costs. As a result of the facility closure, the water right had not been used for an extended period and was in jeopardy of forfeiture. According to the buyer, the issue of forfeiture was a central part of negotiation. The seller was aware that sale was necessary to prevent forfeiture of the right.

3. As discussed in Item #1 above, certain transactional information is confidential and proprietary. However, in an effort to assist RW Beck, individual summaries of water right transactions identified within the Willamette Basin, OR are provided in Attachment B of this memo. Specific information related to names and water right numbers was removed where confidentiality was requested by information sources. WestWater Research requests that this information is not disclosed by RW Beck or CWA to third parties.

4. Attached is a copy of the analysis developed for the "New Project Summary" cost estimates. The primary source for this information the 2001 Central Puget Sound Regional Water Supply Outlook and municipal water supply plans. This information was verified by contacting the municipalities and through supporting information provided by HDR. Information on wholesale water supplies was obtained by directly contacting the region's major providers. The following documents were reviewed in the development of this analysis:

   - Comprehensive Water Plan Update Volume 1. Prepared for the City of Tacoma Water Public Utilities. Prepared by Economic & Engineering Services, Inc in association with CH2M HILL. September 2000.
   - Snoqualmie Aquifier Project Cost and Delivery Alternatives Update. Prepared for East King County Regional Water Association and Golder Associates, Inc. Prepared by HDR Engineering, Inc. October 23, 1996.
   - Water Comprehensive Plan. Prepared for the City of Bellevue. Prepared by Randall L Thompson, Professional Engineer and Melinda J. Friedman, Professional Engineer. 1998.
   - Water Supply Operations Plan - Alternative Evaluation. Prepared for the City of Issaquah. Prepared by Economic and Engineering Services, Inc. July 2003.
   - City of Issaquah 2002 Water System Plan Update Volume 1. Prepared for the City of Issaquah. Prepared by Roth Hill Engineering Partners, LLC in 2000 and 2001.
   - Proposed Second Supply Project Agreement Final Environmental Statement. Prepared by Seattle Public Utilities. October 2000.
   - Proposed Second Supply Project Agreement Final Environmental Impact Statement
   - Appendix B Comments and Responses to Comments on the Draft EIS. Prepared by Seattle Public Utilities, October 2000.
   - City of Issaquah 2002 Water System Plan Update Volume 2 Appendices. Prepared for the City of Issaquah. Prepared by Roth Hill Engineering Partners, LLC. 2002.
   - Woodinville Water District comprehensive Water Plan. Prepared for Woodinville Water District. Prepared by HDR Engineering, Inc. and Financial Consulting Solutions Group, Inc. October 2000.
   - Sammamish Plateau Water and Sewer District; Water Comprehensive Plan. Prepared for the Sammamish Plateau Water and Sewer District of King County, Washington. Prepared by CH2MHILL in association with FCS Group, May 2001.
   - Northshore Utility District and Woodinville Water District Water Supply Project Reconnaissance Level Cost Assessment Draft Technical Memorandum. Prepared for Northshore Utility District. Prepared by HDR Engineering, Inc. December 12, 2000.
   - Snohomish River Regional Water Authority Water Rights Transfer Project Technical Memorandum. Prepared for Woodinville Water District. Prepared by HDR Engineering, Inc. June 1999.

   Total project cost estimates were available for 14 projects. Cost estimates were obtained for both capital expenditures and annual operation and maintenance (O&M) costs. All project costs, including annual O&M charges, were capitalized using a 6 percent discount

rate over a 25-year period. These terms are consistent with those used in the 2001 Central Puget Sound Regional Water Supply Outlook. All project costs were adjusted to 2002 dollars.

Summary of derivations from Outlook high yield estimates.

- Weyerhaeuser Water Right – high yield based on water right #S1-10617 issued by Ecology in 2003.
- Green River Second Supply – high yield estimate based on narrative provided in Outlook that identified average annual diversions from the Green River from 40 to 45 mgd (page 9-18). In addition, this quantity was confirmed by SPU.
- OASIS ASR Project – high yield estimate provide by Lakehaven Utility District.
- Lake Washington Withdrawal – high yield estimate based on narrative in Outlook that states average annual withdrawal of 8 mgd (page 9-34).
- Lake Tapps – high yield estimate based on water rights issued by Ecology and report estimates prepared by HDR provided to WestWater through Perkins Coie.

Capital Cost Adjustments

- With the exception of the Lake Tapps project, all capital costs were obtained from Outlook and were adjusted to the year 2002 dollars.
- All Lake Tapps project costs were based on engineering reports prepared by HDR provided to WestWater through Perkins Coie.

Operation and Maintenance Costs

- All operation and maintenance costs were obtained from Outlook and were adjusted to the year 2003 dollars.
- Operation and maintenance costs were capitalized based on a 25 year period at a 6% discount rate. This is consistent with the terms used by Outlook to estimate the annual capital costs.
- Operation and maintenance costs were estimated for the OASIS and the Central Pierce County Source Development projects based on the average percentage of O&M charges for all projects reviewed in Outlook.

5. The Lake Tapps project costs were based on engineering reports prepared by HDR provided to WestWater through Perkins Coie. HDR reports have been provided and/or made available to CWA through Perkins Coie LLP.

6. The unit prices presented are based on the sum of total capital costs and an estimate of the capitalized annual O&M costs. Unit prices were calculated for both the low and high yield estimates for each project. Tables 1 and 2 provide a summary of the calculations.

7. Wholesale rates varied across wholesale providers and were determined based on a number of different factors. In general, however, water rates are relatively close across the three primary wholesale water providers. Wholesale base rates ranged from $0.62 to $1.68 per ccf. Base rates during nonpeak periods generally range from $0.62 to $0.72 per ccf. These rates represent a one time purchase of water, which is equivalent to an annual lease rate. Table 3 summarizes regional wholesale rates. For comparison purposes, wholesale rates are converted to a price per acre-foot for an annual and permanent basis.[1]

[1] The permanent price was calculated based on a 6% interest rate over a 25 year period. These were the same terms used to capitalize the unit prices calculated for the alternative water supply project costs.

8. The basis of the capitalization rate is derived from the terms used in the Outlook analysis, which used a 6% interest rate over a 25 year period (Table 9-3 in the Outlook Report). The capitalization presented above is based on a standard NPV calculation.

9. Below is the calculation for the Seattle Weighted Average Rate:

   The weighted average was calculated based on the following formula:
   - Total Off Peak Usage Ratio: 0.67 = (245 days/365 days)
   - Off Peak Days: 245 Days
   - Total Peak Usage Ratio: 0.33 = (120 days/365 days)
   - Estimated Weighted Average of Usage: $4,920 = 0.67($4,193) + 0.33($6,406).

   The weighted average is based on SPU's current water rates. These rates are developed by SPU based on a formula that includes current operation and capital expenses as well as anticipated capital charges. The weighted average does not directly include additional cost of purchasing water rights for future supplies. It is expected that these costs would increase the weighted average rate for SPU. Table 4 provides a summary of the weighted average calculations for SPU's current water rates.

Table 1
Puget Sound Regional Water Supply Options

Project Name	Status	Leading Agency	County	Source	Water Rights Qa (MGD)	Water Rights Qi (MGD)	Firm Yield Average Annual (MGD) Low	High	Peak
Weyerhaeuser Water Right	Permitted	SRRWA	Snohomish Co	Snohomish River	23.70	36.00	18.00	23.70	36.00
Sultan Basin Expansion	Conceptual	Everett/Snohomish PUD	Snohomish Co	Sultan River	64.00	129.00	50.00	64.00	129.00
Everett/SPU Intertie	Conceptual	Everett/Snohomish PUD	Snohomish Co	Sultan River	20.00	40.00	9.50	20.00	40.00
Green River Second Supply	Under Design	Tacoma Public Utility	King Co.	Green River	N/A	65.00	40.00	45.00	65.00
Cedar Dead Storage	Permitted	Seattle Public Utility	King Co.	Cedar River	N/A	N/A	20.00	39.00	N/A
Lake Youngs Drawdown	Permitted	Seattle Public Utility	King Co.	Cedar River	N/A	N/A	-	20.00	N/A
OASIS ASR Project	Permitted	Lakehaven Utility District	King Co.		-	-	25.89	25.90	N/A
South Fork Tolt Additional Drawdown	Permitted	Seattle Public Utility	King Co.	Tolt River	N/A	N/A	-	8.00	N/A
Snoqualmie Aquifer	Permitted	EKCRWA, SPU	King Co.	Groundwater	N/A	N/A	9.00	16.00	N/A
Lake Washington Withdrawal	Preliminary Design	Shoreline	King Co.	Lake Washington	N/A	N/A	8.00	8.00	8.00
North Fok Tolt Diversion	Preliminary Design	Seattle Public Utility	King Co.	Tolt River	N/A	N/A	8.00	40.00	N/A
Chambers Creek Properties Project	Permitted	Pierce Co.	Pierce Co	Groundwater	22.00	14.00	2.30	14.00	N/A
Central Pierce County Source Development	Conceptual	Pierce Co.	Pierce Co	Groundwater	5.00	5.00	2.00	5.00	5.00
Lake Tapps Project - Low Capital Costs	Permitted	Puget Sound Energy	Pierce Co	Lake Tapps	64.60	96.70	64.60	64.60	96.70
No Cost Data									
French Creek Project	Preliminary Design	Northshore Utility District	King Co.	Snohomish River	25.00	25.00	25.00	25.00	25.00
Auburn Subregional Groundwater Supply	Preliminary Design	Auburn	King Co.	Groundwater	N/A	N/A	N/A	N/A	N/A
Gig Harbor Peninsula Central Supply	Preliminary Design	Washing Water Svcs.	King Co.	Groundwater	N/A	N/A	N/A	N/A	N/A

Source: 2001 Central Puget Sound Regional Water Supply Outlook

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Table 2
Alternative Water Supply Project Costs (2002 Dollars)

	Project Cost (millions)						
	Capital Cost	Capitalized O&M	Total	Low Yield $/MGD	High Yield $/MGD	Low Yield $/AFT	High Yield $/AFT
Weyerhaeuser Water Right	$166.40	$31.91	$198.31	$11,017,070	$8,367,395	$9,836.67	$7,470.89
Sultan Basin Expansion	$302.64	$75.78	$378.42	$7,568,395	$5,912,808	$6,757.50	$5,279.29
Everett/SPU Intertie	$158.08	$13.29	$171.37	$18,039,441	$8,568,735	$16,106.64	$7,650.66
Green River Second Supply	$237.43	$47.86	$285.29	$7,132,322	$6,339,842	$6,368.14	$5,660.57
Cedar Dead Storage	$21.74	$7.58	$29.31	$1,465,699	$751,640	$1,308.66	$671.11
Lake Youngs Drawdown	$204.88	$31.51	$236.39	-	$11,819,421	-	$10,553.05
OASIS ASR Project	$117.52	$20.80	$138.32	$5,342,024	$5,340,581	$4,769.66	$4,768.38
South Fork Tolt Additional Drawdown	$15.50	$6.09	$21.58	-	$2,698,121	-	$2,409.04
Snoqualmie Aquifer	$81.02	$10.56	$91.57	$10,174,665	$5,723,249	$9,084.52	$5,110.04
Lake Washington Withdrawal	$23.50	$11.43	$34.94	$4,367,179	$4,367,179	$3,899.27	$3,899.27
North Fok Tolt Diversion	$115.44	$17.02	$132.46	$16,557,150	$3,311,430	$14,783.17	$2,956.63
Chambers Creek Properties Project	$40.87	$9.36	$50.23	$21,840,000	$3,588,000	$19,500.00	$3,203.57
Central Pierce County Source Development	$4.16	$0.74	$4.90	$2,448,160	$979,264	$2,185.86	$874.34
Lake Tapps Project -Alternative 1:Connect Tacoma Water	$142.48	$54.51	$196.99	$3,049,353	$3,049,353	$2,722.64	$2,722.64
Lake Tapps Project - Alternative 2: Seattle/Tacoma Intertie	$160.16	$54.51	$214.67	$3,323,038	$3,323,038	$2,967.00	$2,967.00
Lake Tapps Project - Alternative 3: SPU Lake Youngs	$193.44	$58.50	$251.94	$3,899,948	$3,899,948	$3,482.10	$3,482.10
Lake Tapps Project - Alternative 4: Connect CWA	$247.52	$67.80	$315.32	$4,881,160	$4,881,160	$4,358.18	$4,358.18
Lake Tapps Project - CWA Phased Development	$270.00	$97.15	$367.15	$5,683,491	$5,683,491	$5,074.55	$5,074.55

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Table 3
Puget Sound Regional Wholesale Water Rate Comparison

	$/ccf/yr	$/aft Annualized	$/aft Capitalized
Seattle			
Off Peak Usage (Sept. 16 – May 15)	$0.72	$328.03	$4,193.35
Peak Usage (May 16 – Sept. 15)	$1.10	$501.16	$6,406.51
Growth Charge	$0.60	$273.36	$3,494.46
Everett			
East of Snohomish River	$0.66	$300.70	$3,843.90
West of Snohomish River-nonpumped	$0.62	$282.47	$3,610.94
West of Snohomish River-pumped	$1.13	$514.83	$6,581.23
Less than 100 Customers	$1.68	$765.41	$9,784.48
Tacoma			
Constant Customer Use			
October – May	$0.785	$357.65	$4,571.92
June – September	$0.982	$447.40	$5,719.26
Summer Season, Peaking			
June – September	$1.16	$723.00	$9,242.00

Table 4
SPU Weighted Average Water Supply Rates

	$/ccf/yr	$/aft Annualized	$/aft Capitalized
Seattle			
Off Peak Usage (Sept. 16 – May 15)	$0.72	$328.03	$4,193.35
Peak Usage (May 16 – Sept. 15)	$1.10	$501.16	$6,406.51
Growth Charge	$0.60	$273.36	$3,494.46
Weighted Average			$4,920.00

Transaction 2: Thurston County

Grantor:	Don Von Kolk
Grantee:	Thurston County
Water Right No.	S2-22514
Transaction Date:	1998
Total Sale Price:	$50,000
Unit Price:	$1,250 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	100 gallons per minute
Quantity (Qa):	40 acre-feet
Terms:	Permanent Purchase
Priority Date:	May 29, 1974
Location:	Grand Mound
Source:	Chehalis River
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	May 1 to October 1
Comments:	The county acquired an irrigation surface water right from the Chehalis River from a farm that was being converted to residential property. The buyer's asking price was initially $5,000 per acre-foot. The water right is considered a reliable within the Chehalis River. However, the water right transfer was conditioned and is subject to restrictions if flows drop below specified levels.
Verification:	Jim Bachmeir, Thurston County
	Don Davidson, Washington Department of Ecology

Transaction 3: City of Everett

Grantor:	Weyerhaeuser
Grantee:	City of Everett
Water Right No.	S1-10617C
Transaction Date:	1996 with final payment in 2002
Total Sale Price:	$1,360,000
Unit Price:	$51.20 per acre-foot
Volume (Qi):	36 million gallons per day
Quantity (Qa):	23.7 million gallons per day (26,565 acre-feet)
Terms:	Permanent Purchase
Priority Date:	February 28, 1969
Location:	City of Everett
Source:	Ebey Slough, a tributary to Snohomish River
Previous Use:	Pulp Mill Operations
New Use:	Municipal
Period of Use:	Year Round
Comments:	The city made an initial payment of $1,000,000 to Weyerhaeuser in 1996 and a final payment of $10,000 per mgd based on the peaking (Qi) quantity approved by Ecology. A second and final payment of $360,000 was made in 2002. The water right was transferred to the Snohomish River Regional Water Authority. The City of Everett is a member of the authority. There was no basis for the agreed upon price. The sale also included some infrastructure. However, the city indicated that the primary motivation for the sale was the water right.
Verification:	Jim Miller, City of Everett
	Dan Swenson, Washington Department of Ecology

Transaction 4: Private Water Company

Grantor:	Undisclosed
Grantee:	Water Works Company
Water Right No.	G2-24xx
	G2-22xxx
Transaction Date:	**To Be Verified**
Total Sale Price:	$67,200
Unit Price:	$800 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	480 gallons per minute (combined)
Quantity (Qa):	84 acre-feet
Terms:	Permanent Purchase
Priority Date:	March 3, 1953
	February 4, 1974
Location:	Lewis County
Source:	Groundwater
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	Water Works is a small privately owned water company that purchased water rights to expand its service area.
Verification:	Manager of Water Works
	Water Rights Transfer Specialist, Washington Department of Ecology

Transaction 5: Municipal Water Provider

Grantor:	Confidential – Commercial & Residential Property Developer
Grantee:	Municipal Water Provider
Water Right No.	Water Right Easement
Transaction Date:	2000
Total Sale Price:	$570,627
Unit Price:	$3,337.00 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	152,640 gallons per day
Quantity (Qa):	171acre-feet
Terms:	Permanent Donation for Consideration for Water Supply to Property Development
Priority Date:	Not Applicable
Location:	Pierce County
Source:	City Water Main
Previous Use:	Domestic
New Use:	Municipal
Period of Use:	Year Round
Comments:	Developer purchased and is in the process of developing land with an associated water easement issued by City in 1924 and expanded in 1939. In consideration for constructing a water main beneath the property, the city granted a perpetual easement to the original property owner for the use of a three-quarter inch tap of the city's water main.
Verification:	WestWater Research Files Residential Property Developer

Transaction 6: Energy Development

Grantor:	Confidential – Landowner
Grantee:	Confidential – Energy Generation Development
Water Right No.	Confidential
Transaction Date:	2003
Total Sale Price:	$95,400
Unit Price:	$900 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	1 cubic foot per second
Quantity (Qa):	106 acre-feet
Terms:	Option to Permanently Purchase. Expected to be exercised August, 2003
Priority Date:	September 14, 1943
Location:	Chehalis
Source:	Unnamed Slough Adjacent to Chehalis River
Previous Use:	Irrigation
New Use:	Mitigation – Trust Water Right
Period of Use:	April 15 to October 1
Comments:	Developer purchased to comply with mitigation requirements for energy project site certification agreement. The developer holds a one year option that is expected to be exercised before the end of August, 2003. Transaction negotiated by WestWater Research on behalf o the energy development.
Verification:	WestWater Research Files Preston Gates & Ellis

Transaction 7: Energy Development

Grantor:	Confidential – Landowner
Grantee:	Confidential – Energy Generation Development
Water Right No.	Confidential
Transaction Date:	2002
Total Sale Price:	To Be Determined
Unit Price:	$1,000 for 12 month option Exercise price $800 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	600 gallons per minute
Quantity (Qa):	52.46 acre-feet
Terms:	Option to Permanently Purchase.
Priority Date:	July 27, 1960
Location:	Chehalis
Source:	Groundwater
Previous Use:	Sand & Gravel
New Use:	Mitigation – Trust Water Right
Period of Use:	Year Round
Comments:	Developer purchased to comply with mitigation requirements for energy project site certification agreement. The developer holds a one year option but is not expected to exercise the option. The developer holds a second option with similar terms for an irrigation water right. Transaction negotiated by WestWater Research on behalf o the energy development.
Verification:	WestWater Research Files Preston Gates & Ellis

Transaction 8: Industrial Facility Water Right Sale

Grantor:	Confidential – Industrial Facility
Grantee:	Confidential – Municipal Water District
Water Right No.	Includes 3 water rights
Transaction Date:	To be completed – Terms Agreed upon November, 2002
Total Sale Price:	$3,600,000
Unit Price:	$535.29 per acre-foot
Volume (Qi):	6 million gallons per day
Quantity (Qa):	6 million gallons per day (6,725 acre-feet)
Terms:	Permanent Sale
Priority Date:	To Be Verified
Location:	Pierce County
Source:	Groundwater
Previous Use:	Industrial Operations
New Use:	Municipal Use
Period of Use:	Year Round
Comments:	This transaction will be completed upon final approval by the Washington Department of Ecology. A transfer application has been filed with the department, but was delayed due to the Lake Tapps water right application.
Verification:	WestWater Research Files Stoel Rives Representative from Industrial Facility

Transaction 9: Private Water Corp.

Grantor:	Confidential
Grantee:	Private Water Corp
Water Right No.	**To Be Verified**
Transaction Date:	1996
Total Sale Price:	$20,000
Unit Price:	$666 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	30 acre-feet
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Chehalis
Source:	Groundwater
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	
Verification:	Representative from Private Water Corp. Water Rights Specialist, Washington Department of Ecology

Transaction 10: Chehalis Area Purchase Agreement

Grantor:	Private Landowner
Grantee:	Private Lanowner
Water Right No.	**To Be Verified**
Transaction Date:	1998
Total Sale Price:	$30,000
Unit Price:	$909 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	33 acre-feet
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Chehalis
Source:	**To Be Verified**
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	April 15 to October 1
Comments:	A purchase and sale agreement was entered into by the parties, but the water right transfer was denied by the Washington Department of Ecology
Verification:	Private Landowner
	Representative, Washington Department of Ecology

Transaction 11: Lacey Area Purchase Agreement

Grantor:	Confidential
Grantee:	Confidential
Water Right No.	Unperfected Permit
Transaction Date:	To be completed – Sale Terms Agreed upon in 2003
Total Sale Price:	$405,000
Unit Price:	$900 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	450 acre-feet
Terms:	Permanent Purchase
Priority Date:	**To Be Verified**
Location:	Lacey
Source:	Groundwater
Previous Use:	Commercial and Industrial
New Use:	Municipal
Period of Use:	Year Round
Comments:	The parties have entered into a purchase and sale agreement and a transfer application has been submitted to the Washington Department of Ecology. Water transfer is pending approval.
Verification:	Perkins Coie

Transaction 12: Black Lake Area Purchase Agreement

Grantor:	Confidential
Grantee:	Confidential
Water Right No.	Confidential
Transaction Date:	To be completed – Sale Terms Agreed upon in 2003
Total Sale Price:	$112,000
Unit Price:	$2,800 per acre-foot for each acre-foot transferable and usable by the grantee.
Volume (Qi):	**To Be Verified**
Quantity (Qa):	40 acre-feet
Terms:	Permanent Purchase
Priority Date:	1960s Senior Water Right
Location:	Lacey
Source:	Groundwater
Previous Use:	Irrigation
New Use:	Municipal
Period of Use:	Year Round
Comments:	The parties have entered into a purchase and sale agreement and a transfer application has been submitted to the Thurston County Conservancy Board. The water right is located in the Black River Basin, a tributary to the Chehalis River. The region has a limited number of water rights.
Verification:	Perkins Coie Buck and Gordon

Attachment B:

Western Oregon Water Transaction Reports

The following section provides a summary of individual water right transactions identified in western Oregon and the Willamette Basin Region.

Comp. Sale Ref. #	**1**
Date Verified:	October 17, 2001
Prepared By:	Clay Landry
Transaction Date:	July, 2001
Grantor:	Regional Water District
Grantee:	Private Water Sewerage Company
Total Sale Price:	$367,200
Unit Price:	$204/acre-foot (aft) (annualized)
	$0.47/100^3 feet (ccf)
	$1643/aft (capitalized)
Terms:	One Time Purchase (one year lease)
Water Quantity:	1800 Acre-feet
Acreage:	-
Duty:	-
Location:	Barney Reservoir, Tualatin Watershed, Oregon
Stream:	Tualatin River
Previous Use:	Municipal
New Use:	Flow Maintenance
Comments:	The sale price was determined by the difference in the water rates from the Portland Water Bureau and the Joint Water Commission.
	Water District Representative
	Water Sewerage Company Representative

Comp. Sale Ref. #	**2**
Date Verified:	October 26, 2001
Prepared By:	Clay Landry
Transaction Date:	August 16, 2001
Grantor:	Forest Grove
Grantee:	Beaverton
Total Sale Price:	$56,000
Unit Price:	$80/Acre-foot (annualized)
	$644/aft (capitalized)
Terms:	One Time Purchase
Water Quantity:	700
Acreage:	-
Duty:	-
Location:	Hagg Lake, Oregon
Stream:	Tualatin River
Previous Use:	Municipal Use
New Use:	Municipal Use
Comments:	Forest Grove City Council approved the purchase of up to 1,000 acre-feet of water from Beaverton through November, 2001. The transaction is structure in two parts. The first 700 aft will be acquired at a total cost of $56,000 and the remaining 300 aft will be purchased for $26,000.
Verified	Representative, Forest Grove City

Comp. Sale Ref. #	**3**
Date Verified:	October 26, 2001
Prepared By:	Clay Landry
Transaction Date:	August 16, 2001
Grantor:	Forest Grove
Grantee:	Beaverton
Total Sale Price:	$26,000
Unit Price:	$86.67/Acre-foot (annualized)
	$698/aft (capitalized)
Terms:	One Time Purchase
Water Quantity:	300
Acreage:	-
Duty:	-
Location:	Hagg Lake, Oregon
Stream:	Tualatin River
Previous Use:	Municipal Use
New Use:	Municipal Use
Comments:	Second part of a two part transaction between Forest Grove and Beaverton.
Verified	Representative, Forest Grove City

Comp. Sale Ref. #	**4**
Date Verified:	October 26, 2001
Prepared By:	Clay Landry
Transaction Date:	June 2001
Grantor:	Irrigation District
Grantee:	Water Sewerage Company
Total Sale Price:	$500,000 plus $10,000 administrative fee
Unit Price:	$250/Aft (not including the administrative fee) (annualized)
	$2014/aft (capitalized)
Terms:	One year lease
Water Quantity:	2000
Acreage:	-
Duty:	-
Location:	Tualatin, Oregon
Stream:	Tualatin River
Previous Use:	Agricultural Use
New Use:	Stream Flow Maintenance
Comments:	The wastewater treatment company was required under the terms of existing state and federal discharge permits to provide flow augmentation in receiving streams. The irrigation district limited the contract to "excess water." Due to the 2001 drought, the irrigation district determined that no excess water was available. The contract was never exercised and no payment was made beyond the $10,000.
Verified:	Representative, Water Sewerage Company

Comp. Sale Ref. #	**5**
Date Verified:	October 31, 2001
Prepared By:	Clay Landry
Transaction Date:	April 2000
Grantor:	Irrigation District
Grantee:	Golf Course
Total Sale Price:	
Unit Price:	$60/aft (annualized)
	$826/aft (capitalized)
Terms:	10 Year Lease Interruptible Based on ID's water reserves
Water Quantity:	700 acre-feet
Acreage:	350 acres
Duty:	2 acre-feet per acre
Location:	Scoggins Reservoir
Stream:	Tualatin River
Previous Use:	Irrigation Use
New Use:	Recreational/Irrigation
Comments:	Scoggins Reservoir is a federal operated storage facility, therefore the price was determined by federal municipal and industrial rate of $60/aft. Water supplies to the golf course were interrupted in 2001, the fourth year of the contract. The golf course had to apply for a new water right and complete the NEPA process in order to secure delivery of the water.
Verified:	Irrigation District

Comp. Sale Ref. #	**6**
Date Verified:	October 26, 2001
Prepared By:	Clay Landry
Transaction Date:	June, 2001
Grantor:	Municipal Water District
Grantee:	Municipality
Total Sale Price:	$1,250,000
Unit Price:	$1153/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	1.50 cfs (1084.05 aft)
Acreage:	-
Duty:	-
Location:	Oregon Coast
Stream:	Stream
Previous Use:	Undeveloped water right permit
New Use:	Municipal use
Comments:	This transaction involves the transfer of a water right permit. X holds two water right permits for municipal water use totaling 7.0 cfs of water from X Creek. The first permit for 3.0 cfs has a priority date of 1963. The second permit for 4.0 cfs has a priority date of 1970. X has developed 1.6 cfs under the 1963 water right and is transferring 1.5 cfs from the undeveloped 1970 permit. A key part of this transfer is that the new lands to be serviced by the permit are contiguous to those served under the original water right permit.
Verified:	Schwabe Williams and Wyatt

Comp. Sale Ref. #	**7**
Date Verified:	October 31, 2001
Prepared By:	Clay Landry
Transaction Date:	April, 2000
Grantor:	Landowner
Grantee:	Golf Course
Total Sale Price:	$75,000
Unit Price:	$375/aft (capitalized)
Terms:	Permanent transfer
Water Quantity:	200.5
Acreage:	80.2
Duty:	2.5 aft/acre
Location:	-
Stream:	-
Previous Use:	Agricultural Irrigation
New Use:	Golf Course
Comments:	In 2000, a golf course sought a surface water supply to supplement diminishing ground water supplies. The golf course purchased 80.2 acres of water rights with priority dates in 1950 and 1951 (max duty of 2.5 aft/acre). Arrangement was for a permanent transfer. Total purchase price was $75,000, not including administrative costs associated with administrative transfer process. The transfer application was then protested in an administrative proceeding before the Oregon Water Resources Department by another water right holder on the same stream system claiming potential injury from change in location of diversion point and change in place of use. Protest was resolved through a confidential settlement agreement.
Verified:	Schwabe Williams and Wyatt

Comp. Sale Ref. #	**8**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	July, 1990
Grantor:	Irrigator
Grantee:	Nursery
Total Sale Price:	$23, 148
Unit Price:	$1425/aft (capitalized)
Terms:	Permanent Sale
Water Quantity:	16 aft
Acreage:	6.5
Duty:	2.5 aft/acre
Location:	Tualatin Valley Irrigation District, Washington County
Stream:	McKay Creek
Previous Use:	Agriculture
New Use:	Agriculture
Comments:	Observation obtained from Landry (1995). Price has been adjusted to 2001 dollars.

Comp. Sale Ref. #	**9**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	November, 1989
Grantor:	Retired Farmer
Grantee:	Agricultural Producer
Total Sale Price:	$157,902
Unit Price:	$507/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	311 aft
Acreage:	124.5 acres
Duty:	2.5 aft/acre
Location:	Marion County
Stream:	Well
Previous Use:	Irrigation
New Use:	Irrigation
Comments:	Observation obtained from Landry (1995). Sale price adjusted to 2001 dollars.

Comp. Sale Ref. #	**10**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	July, 1989
Grantor:	Agricultural Producer
Grantee:	Agricultural Producer/Nursery
Total Sale Price:	$25,265
Unit Price:	$143.50/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	176 aft
Acreage:	70.4
Duty:	2.5 aft/acre
Location:	Washington County
Stream:	Dairy Creek
Previous Use:	Irrigation
New Use:	Irrigation
Comments:	Observation obtained from Landry (1995). Sale price adjusted to 2001 dollars.

Comp. Sale Ref. #	**11**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	March, 1988
Grantor:	Landowner
Grantee:	Landowner
Total Sale Price:	$14,746
Unit Price:	$1134/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	13 aft
Acreage:	5 acres
Duty:	2.5 aft/acre
Location:	Polk County
Stream:	Well
Previous Use:	Irrigation
New Use:	Landscape Irrigation
Comments:	Observation obtained from Landry (1995). Sale price adjusted to 2001 dollars.

Comp. Sale Ref. #	**12**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	December 1985
Grantor:	Agricultural Producer
Grantee:	Agricultural Producer
Total Sale Price:	$66,166
Unit Price:	$1141/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	58
Acreage:	23 acres
Duty:	2.5 aft/acre
Location:	Polk County
Stream:	Mill Creek
Previous Use:	Irrigation
New Use:	Irrigation
Comments:	Observation obtained from Landry (1995). Sale price adjusted to 2001 dollars.

Comp. Sale Ref. #	**13**
Date Verified:	December, 1995
Prepared By:	Clay Landry
Transaction Date:	July, 1990
Grantor:	Landowner
Grantee:	Landowner
Total Sale Price:	$1150
Unit Price:	$153/aft (capitalized)
Terms:	Permanent Transfer
Water Quantity:	7.5
Acreage:	3 acres
Duty:	2.5 aft/acre
Location:	Washington County
Stream:	Tualatin River
Previous Use:	Irrigation
New Use:	Landscape Irrigation
Comments:	Observation obtained from Landry (1995). Sale price adjusted to 2001 dollars.

Market Valuation of Water Rights in Western Washington

May 6, 2004

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WestWater's Experience
Clients-Public Sector

- **Federal Government**
  - Bonneville Power Administration
  - US Bureau of Reclamation
  - National Park Service
  - Natural Resources Conservation Service
- **State & Local Governments**
  - Washington Dept. of Ecology
  - Island County, WA
  - Oregon State Parks
  - Oregon Watershed Enhancement Board
  - Texas Parks
  - Hawaii Board of Land & Natural Resources
- **Nonprofit Organizations**
  - Oregon Water Trust
  - Montana Water Trust
  - Texas Public Policy Foundation
  - National Fish & Wildlife Foundation
  - Mile High Conservation District
  - Sand County Foundation
  - York Foundation

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WestWater's Experience
Clients-Private Sector

- **Water Supply Industry:**
  - Oak Lodge Municipal Water District, OR
  - Semitropic Water District
  - Port of Umatilla, OR
  - Pikes Peak Water
  - Ellicott Springs Resources
- **Energy sector:**
  - Tractebel Power
  - Chehalis Power
  - PacifiCorp
  - Marin Coal
  - Silver Eagle Oil Refineries
  - Magnum Hunter Resources
- **Law Firms:**
  - Schwabe Williamson & Wyatt
  - Josephson & Dringman
  - Preston Gates & Ellis
  - Perkins Coie
  - Graves Law Firm
- **Property Developers:**
  - Davis Properties Inc.
  - Arizona Recreation Facilities
  - Access Golf
  - Silver Point Capital
  - Pegasus Capital Fund

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WestWater's Experience
Washington Projects

- Dungeness Basin Water Valuation
  - Client: Washington Department of Ecology
- Wapatox Water Right Valuation
  - Client: USBR
- Chehalis Water Rights Purchase
  - Client: Chehalis Power Generation
- Flower Ditch Water Rights Valuation
  - Client: Washington Department of Ecology
- Sammamish River Water Right Purchase
  - Client: Property Developer
- Southern Puget Sound Water Rights Mapping
  - The Water Companies, LLC

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Water Markets Overview
Major Water Transactions, Western US
1998-2002

Source: Water Strategist

Water Markets Overview
Representative Market Price Ranges
Local & Regional Price Dispersion

Region	Market	Price/Aft
Southwest	Texas	$250 - $3,000
	Nevada	$640 - $4,000
	Wasatch Front, UT	$500 - $2,000
	Pheonix, AZ	$800 - $1,400
Pacific Northwest		
	Bend, OR	$400 - $2,000
	Central WA	$500 - $1,000
	Western WA	$600 - $3,500
Rocky Mountains		
	Front Range, CO	$8,000 - $17,000
	Wyoming	$50 - $3,000
	Montana	$150 - $600

Source: WestWater Research
Water Strategist

Washington Water Market Overview

- Emerging Market Areas
- Market is thinly traded
- Limited number of transactions
- Few large transactions
- Market prices trade on a $/acre-feet (aft)
  - 1 MGD equal to 1,120 acre-feet per year

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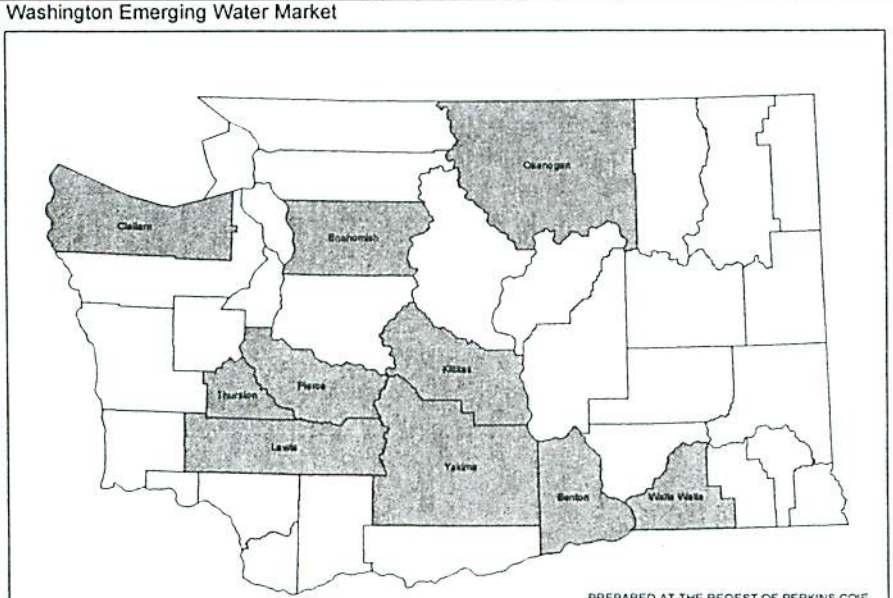
Washington Emerging Water Market



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Western Washington
Market Participants

Buyers	Sellers
• Municipalities	• Industrial Facilities
• Private Water Purveyors	• Irrigation Rights
• Golf Courses	• Water Purveyors
• Real Estate Development	
• Energy Facilities	

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Central & Eastern Washington
Market Participants

Buyers	Sellers
• US Bureau Reclamation	• Agricultural Producers
• Department of Ecology	• Property Development
• Mountain Star Resort	• Energy Facilities
• Stimpson Lane Vineyards	
• Quad Cities	
• Orchard Farms	
• Small Municipalities	
• Energy Facilities	
• Small Landowners	

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Valuation Approach
Lake Tapps Water Right

- Comparable Sales
- Replacement Costs/Avoided Costs
- Income Capitalization

Comparable Sales Review

- Compares the subject water rights with similar water rights that have been sold or leased.
  - Requires sufficient transactions to provide accurate comparisons
  - Additional valuation techniques recommended when sales information is limited.
- Comparable Sales Valuation Challenge for Lake Tapps
  - Large transactions size
  - Regional water supply source
  - Unique water right

Western Washington Transactions

- 12 transactions identified between 1996-2003
- Majority of transactions occurred between 2000-2003
- Transactions located in Southern Puget Sound area
- Small volumes of water
- Municipal and Domestic use is the principle buyer
- One transaction excluded Distressed Sale

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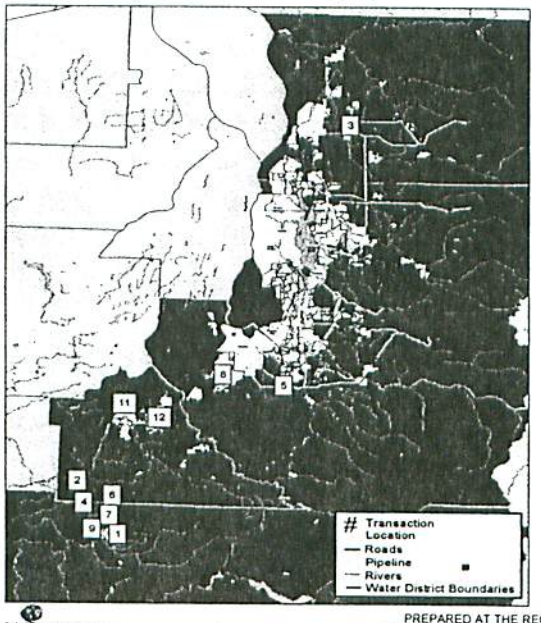
Western Washington Water Transaction Reports



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Western Washington Transaction Summary

Summary of Comparable Sales

Ref #	Year	Seller	Buyer	Total Price	Quantity (AF)	$/AF Cap Rate
1	1998	Irrigation	Municipal	$ 10,000.00	8	$ 1,250.00
1	1998	Irrigation	Municipal	$ 50,000.00	40	$ 1,250.00
3	1996	Industrial	Municipal	$ 1,360,000.00	26,565	$ 51.20
4	N/A	Irrigation	Municipal	$ 67,200.00	84	$ 800.00
5	2000	Domestic	Municipal	$ 570,627.00	171	$ 3,337.00
6	2003	Irrigation	Mitigation	$ 95,400.00	106	$ 900.00
7	2002	Sand & Gravel	Mitigation	$ 42,400.00	53	$ 800.00
8	2002	Industrial	Municipal	$ 3,600,000.00	6,725	$ 535.29
9	1996	Irrigation	Municipal	$ 20,000.00	30	$ 666.00
10	1998	Irrigation	Municipal	$ 30,000.00	33	$ 909.00
11	2003	Industrial	Municipal	$ 405,000.00	450	$ 900.00
12	2003	Irrigation	Municipal	$ 112,000.00	40	$ 2,800.00

Summary of Findings

- 11 transactions reviewed that were considered arms length and non-stressed sales
  - Price Range: $535 to $3,337/aft
  - Median Value: $900/aft
  - Average Value: $1,286/aft
  - Transaction size: 52 aft-6,725 aft
- Limited number of sales comparable to size of Lake Tapps water right
- Recommend using alternative approaches to reconcile and validate comparable sales range.

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Regional Market Comparisons

- **San Francisco Bay Area**
  - Trades Dominated by Municipal Water Purveyors
  - Large Volume Trades
    - Transaction Volume: 1,000 to 200,000 AFT
  - Prices Steadily Increasing
  - Recent Trades of SWP contracts at $1,500/AFT
  - Market Price Summary
    - Average Price: $1,200 to $1,500/AFT
    - Low Price: $500/AFT
    - High Price: $2,500/AFT
- **Willamette Basin, Oregon**
  - Trades Dominated by Municipal/Domestic Buyers
  - Increasing Trading Activity within Last 5 Years
  - 13 Transactions Recorded in Over 15 Year Period
  - Market Price Summary
    - Average Price $914/AFT
    - Minimum Price: $153/AFT
    - Maximum Price: $2,014/AFT

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Avoided Cost/ Replacement Cost Approach

- Estimates value based on the current cost of reproducing or replacing an equivalent quantity of water.
  - Commonly used in areas where water rights are limited and the market price for water is dominated by investment alternatives.
  - Used if information from comparable sales and income capitalization approaches is limited.
- Projects Reviewed
  - New Source Development
  - Wholesale Water Purveyors

New Source Development

- Project Costs for 17 major water supply projects
  - Development of New Ground and Surface sources
  - Expansion existing sources
  - Reservoir Expansion and ASR

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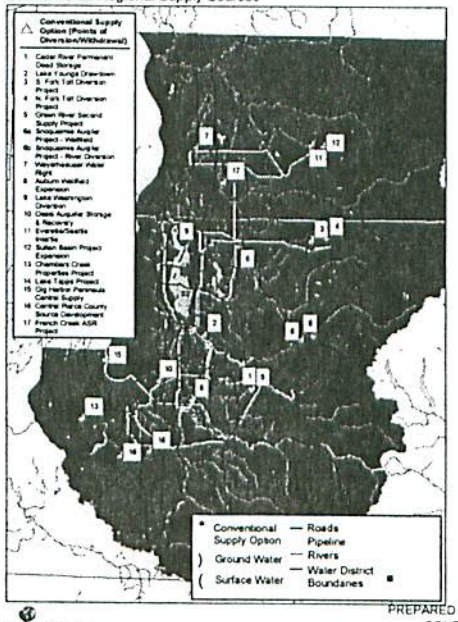
Conventional Regional Supply Sources



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Comparative Cost of New Projects

Cost Comparison Assumptions

- Accuracy of Project Costs
  - O&M Costs
  - Capital Costs
- Water Rights & Water Source Costs
- Unit Cost Based on Firm Yield Quantity
- Project Costs Do Not Reflect Transmission Capital Cost to CWA Service Area

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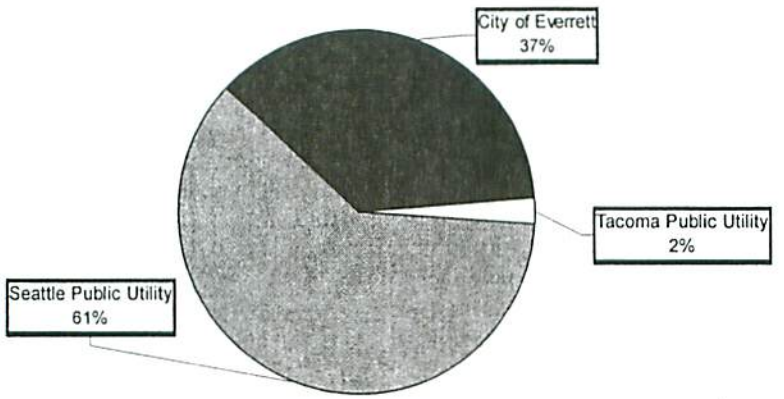
New Project Summary

Project Costs ($2002)

Lake Tapps Project: Alternative 1	64.6	$142	$4.10	$2,206,573	$1,969
Lake Tapps Project: Alternative 2	64.6	$160	$4.10	$2,479,267	$2,214
Lake Tapps Project: Alternative 3	64.6	$193	$4.40	$2,994,427	$2,674
Lake Tapps Project: Alternative 4	64.6	$248	$5.10	$3,831,579	$3,421
Lake Tapps Project: CWA Phase Develop.	64.6	$270	$7.60	$4,179,567	$3,732
Sultan Basin Expansion	64	$303	$5.70	$4,728,750	$4,222
Green River Second Supply	46	$237	$3.60	$5,276,267	$4,711
North Fork Tolt Diversion	40	$116	$1.28	$2,886,000	$2,577
Cedar Dead Storage	39	$22	$0.57	$557,333	$498
OASIS ASR Project	25.9	$118	$1.56	$4,537,452	$4,051
Weyerhaeuser Water Right	23.7	$166	$2.40	$7,021,097	$6,269
Everett/SPU Intertie	20	$158	$1.00	$7,904,000	$7,057
Lake Youngs Drawdown	20	$205	$2.37	$10,244,000	$9,146
Snoqualmie Aquifer	16	$81	$0.79	$5,063,500	$4,521
Chambers Creek Properties Project	14	$41	$0.70	$2,919,429	$2,607
South Fork Tolt Additional Drawdown	8	$15	$0.46	$1,937,000	$1,729
Lake Washington Withdrawal	8	$24	$0.80	$2,938,000	$2,623
Central Pierce County Source Development	5	$4	$0.06	$832,000	$743

Puget Sound Wholesale Water

Total Annual Wholesale Volume 109 MGD



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Wholesale Rate Comparison

Puget Sound Regional Wholesale Water Rate Comparison

	$/ccf/yr	$/aft Annualized	$/aft Capitalized
Seattle			
Off Peak Usage (Sept. 16 – May 15)	$0.72	$328.03	$4,193.35
Peak Usage (May 16 – Sept. 15)	$1.10	$501.16	$6,406.51
Growth Charge	$0.60	$273.36	$3,494.46
Everett			
East of Snohomish River	$0.66	$300.70	$3,843.90
West of Snohomish River-nonpumped	$0.62	$282.47	$3,610.94
West of Snohomish River-pumped	$1.13	$514.83	$6,581.23
Less than 100 Customers	$1.68	$765.41	$9,784.48
Tacoma			
Constant Customer Use			
October – May	$0.785	$357.65	$4,571.92
June – September	$0.982	$447.40	$5,719.26
Summer Season, Peaking			
June – September	$1.16	$723.00	$9,242.00

Large Scale Water Projects

Cost Comparison $/aft Capitalized

Lake Tapps Capital Costs	84.6	$1,969	$2,213	$2,673	$3,421	$3,731
Sultan Basin Expansion	64	$4,222	$4,222	$4,222	$4,222	$4,222
Differential		*$2,253*	*$2,009*	*$1,549*	*$801*	*$491*
Green River Second Supply	40	$4,710	$4,710	$4,710	$4,710	$4,710
Differential		*$2,741*	*$2,497*	*$2,037*	*$1,289*	*$979*
Weyerhaeuser Water Right	36	$6,269	$6,269	$6,269	$6,269	$6,269
Differential		*$4,300*	*$4,056*	*$3,596*	*$2,848*	*$2,538*
Seattle Weighted Average Rate	-	$4,920	$4,920	$4,920	$4,920	$4,920
Differential		*$2,950*	*$2,706*	*$2,246*	*$1,498*	*$1,188*

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Final Reconciliation of Value

- Comparable Sales Summary
  - Price Range: $535 to $3,337/AFT
  - Average Price: $1,286/AFT
  - Median Price: $900/AFT
  - Small Transaction Volumes
  - Does not include capital cost charge
- New Water Supply Options
  - Cost Range: $498 to $9,146/AFT
  - Average Unit Cost: $3,904
  - Large Projects have High Capital Costs
    - Sultan Basin: $4,222/AFT
    - Green River SS: $4,710/AFT
    - Weyerhaeuser Right: $6,269/AFT
  - Projects Do Not Include a Source Water Charge
  - Rates primarily based on capital cost recovery
  - Capital and O&M Costs Significantly Higher then Raw Water Costs
- Regional Wholesale Water Costs
  - Price Range: $3,610 to $9,784/AFT - Capitalized
  - Limited Future Development
  - Anticipated Future Rate Increases

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Final Reconciliation of Value

- Lake Tapps Water Right Value
  - Based on Comparable Sales
    - Nominal Value Range: $65 to $95.4 million
  - Based on Avoided Cost – New Project Cost Differential
    - Nominal Value Range: $35 to $331 million
  - Based on Wholesale Rates – Seattle Cost Differential
    - Nominal Value Range: $86 to $214 million
- Water Right Comparables Representative of Raw Water Source Costs
  - Water Right Prices Similar to Other Regional Market Price Ranges.
  - Comparable Sales are Representative of Water Right Prices in Puget Sound Region.
  - Capital Cost Differentials Between Lake Tapps and Alternative New Source Projects consistent with water right comparable price range.

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Memorandum

To: Mark Quehrn, Perkins Coie

CC: Harry Seely

From: Clay Landry

Date: 11/4/2005

Re: Valuation of Lake Tapps Water Rights - DRAFT

Purpose and Objective:

Puget Sound Energy, Inc. ("PSE") has requested that WestWater Research review the terms and conditions proposed by PSE and the Cascade Water Alliance ("Cascade") regarding the sale of municipal water right applications. A copy of the agreement summarizing the key terms and conditions of the proposed transaction is attached ("Term Sheet"). The purpose of this review is to evaluate the consistency of the proposed terms and price with recorded water right transactions in the region. Prices are evaluated on a unit basis (dollars per acre-foot).

This review is not intended to serve as a fully self contained water right appraisal, which would have included an assessment of the transferability and marketability of the PSE water rights. Completion of a full appraisal estimating the total fair market value of the water right applications would have required assumptions regarding Washington State Department of Ecology's final determination regarding the applications. The uniqueness of the proposed transaction as well as the variety of entities involved in the public comment made the outcome of Ecology's Report of Examination uncertain at the time of the analysis. Consequently, a review of recent and relevant water right transactions was determined to be the most appropriate course of action. This review specifically focuses on the price that has been negotiated for the municipal water right applications relative to prices paid for other water rights in the region, and does not address the negotiated price for (or value of) any other assets.

Background:

On April 27, 2005 PSE and Cascade executed the Term Sheet for the sale of municipal water right applications S2-29920, S2-29934, and R2-29935 and related White River Hydropower Project assets. WestWater Research was retained by PSE in 2003 to

provide ongoing assistance and advisement for pricing and valuing the municipal water right applications. Sales of water rights within the region are relatively uncommon. As a result, price and transactional information is limited. Within the limited transaction information, there is large price dispersion and variation in terms largely reflecting the individual characteristics of the water rights and conditions affecting each sale.

The proposed transaction is unique when compared to previous transactions due to the size and previous use of the water rights. The proposed sale involves water right applications rather than developed water rights. Previous water right sales have involved water rights that have moved beyond the application stage. Furthermore, if completed, the proposed sale will be the single largest permanent water right sale within the state of Washington to date. In some areas, larger volume sales have exhibited lower unit prices due to relatively few potential buyers with the immediate need for the full quantity of water provided by the rights. In addition, unit prices tend to be lower for large water right sales as transaction costs are spread over more acre-feet. In other areas, larger volume sales have commanded a higher than average unit price due to the purchaser's desire to reduce the number of transactions and time necessary to fulfill its water needs. In this case, previous water right transactions in the region are not adequate to fully address the impact of volume on unit price or capture the effect that previous use of the water rights has on marketability and value.

To overcome the limited information, WestWater Research conducted multiple valuation methods to develop a range of values to assist PSE with pricing the municipal water right applications. The research conducted by WestWater Research is attached to this memorandum for your further reference and information.

Summary of Proposed Transaction:

The proposed purchase price for the municipal water right applications and related hydroelectric assets is as follows:

- Minimum Purchase Price: $10 million
- Extension Payment: $3 million
- Contingent Additional Purchase Price: $27 to $39.1 million
- Total: $40 million to $52.1 million

The Minimum Purchase Price of $10 million was paid by Cascade for a variety of assets utilized in support of hydropower production. The assets include land, water management facilities, and PSE's hydropower water rights. Acquisition of the hydropower rights and related infrastructure was necessary to secure the future reliability of the pending municipal water right applications and provide no ancillary benefits to Cascade. However, the assets purchased are considered separable and marketable from the municipal water rights applications. Therefore, in this analysis the $10 million payment is not applied to the value of the water right applications.

Per the Term Sheet, the "Contingent Additional Purchase" price is due and payable following a "Successful Resolution" of any municipal water rights appeals. The variability of this price ($27 to $39.1 million) reflects price adjustments associated with the date that this condition is satisfied. The $3 million Extension Payment reflects the amount that Cascade has previously paid to PSE for the right to acquire the municipal water right applications. For the purpose of this analysis, it is assumed that the "Contingent Additional Purchase Price" and the Extension Payment represent the purchase price and the total amount of consideration to be received by PSE for the transfer of the municipal water right applications. Therefore, this purchase price ($30 million to $42.1 million) is used as the basis in establishing a unit price for comparison to other water right transactions in the region. Additional detail on the water right transactions can be found in the attached memorandum to Bruce Dick (Perkins Coie) titled "Water Market Consultation Report for Western Washington," provided on August 5, 2003.

Unit Price Calculation:

A total volume of 61,400 acre-feet is used to establish the unit price. PSE filed applications with the Washington Department of Ecology to transfer 72,400 acre-feet per year to new water rights for municipal use. The applications were initially approved with the condition that 11,000 acre-feet be reserved for source exchange. The remaining balance of 61,400 acre-feet represents available water for municipal use under the applications.

The estimated unit price for the propose agreement for the water rights is calculated as follows:

Water Applications Purchase Price: $30 million to $42.1 million
Municipal Water Right Volume: 61,400 acre-feet
Estimated Unit Price: $489 to $686 per acre-foot

Comparison of Water Market Transactions:

WestWater Research conducted a review of water right transactions for Puget Sound Energy in 2003. The results and findings are summarized in the August 5, 2003 memo to Bruce Dick, Perkins Coie, which is attached to this memorandum for your further reference and information.

The review considered a total of 12 water right transactions that occurred within the greater Puget Sound region during the period from 1996 to 2003. Transactions prior to 1996 were not included due to possible changes in conditions affecting water right values in subsequent years. All of the recorded transactions were sales or options to permanently acquire water right permits or certificates. It should be noted that none of the recorded transactions involved water rights in the application stage of development.

The majority of recorded transactions occurred during the period from 2000 to 2003. Recorded transaction prices varied widely with prices ranging from $51.20 to $3,337 per acre-foot.

Transaction sizes ranged from 8 to 26,565 acre-feet, and all were significantly smaller than the municipal water right applications held by PSE. The two largest transactions involved water rights formerly used in support of pulp and paper production (Transactions 3 and 8 reported in the August 5, 2003 Memorandum). Both water rights were purchased for municipal purposes. The most recent of those transactions (Transaction 3) occurred in Pierce County in 2002 and involved approximately 6,725 acre-feet of water rights held by Abitibi. The water rights are under contract for approximately $3,600,000. Closing is contingent upon final approval by the Washington Department of Ecology. Specific terms of the contract are confidential until closing is completed; however the estimated unit price for the transaction is $535 per acre-foot.

Transaction 8 involved 26,565 acre-feet of water rights formerly used by a Weyerhaeuser pulp mill located on the Snohomish River. The City of Everett purchased the rights for a total price of $1.36 million; an estimated unit price of $51.20 per acre-foot. The transaction is considered to be a distressed sale due to nonuse and impending forfeiture of the water rights which greatly reduced the marketability and price that the water rights could command. Consequently, the transaction price was not considered to be appropriate to include when considering the value of a water right that is not at risk of forfeiture and was excluded from further analysis.

Updated Transaction Information:

Following the previous review of water right sales, information on one recent transaction in the region was recorded by WestWater Research. Below is a summary of the transaction.

Cascade Golf Course Water Right Sale: A water right for 33 acre-feet was purchased by Cascade Golf Course from a small private water company that no longer needed the water due to consolidation with Sallal Water Association. The golf course intends to use the water for irrigation purposes.

Transaction Date: 2005
Sale Price: $33,000
Unit Price: $1,000 per acre-foot
Source: Groundwater
Quantity: 33 acre-feet

Transactions Summary:

In total, thirteen permanent water right transactions were recorded in the region. Transaction 8 was removed from further consideration, leaving twelve transactions. The unit prices of the twelve transactions range from $535 to $3,337 per acre-foot. The median price of the twelve transactions is $905 per acre-foot and the average price is $1,262 per acre-foot. Ten of the twelve water right sales had unit prices between $535 and $1,250 per acre-foot.

Additional Considerations:

As previously described, the estimated unit price for the PSE municipal water right applications is between $489 and $686 per acre-foot. These unit values are within the range of unit values observed for previous water right transactions in the region, although near the lower end of this range. A unit value for water right *applications* in the lower end of this range is consistent with and is likely attributable to the following factors that tend to depress the value of this asset:

- The PSE municipal water rights remain in the application stage. Previous sales in the region have involved water rights that have been developed. Developed water rights generally provide more certainty to a buyer with respect to administrative approval and regulation and are therefore expected to command a higher price than applications.

- Cascade has and will continue to incur water applications processing costs. In addition, we are advised of the likelihood that the Department of Ecology's final determination regarding the applications will be appealed by one or more of the following entities: the Puyallup Tribe of Indians, the Muckleshoot Indian Tribe, and the cities of Auburn, Algona and Pacific. These appeals may entail significant litigation costs. We are further advised that Cascade is pursuing pre-decision settlement agreements with one of more of the Tribes, and mitigation costs associated with these settlements could be substantial. It is therefore reasonable to assume that some or all of these potential costs were factored into the negotiated price for the applications.

- In order to maximize the management and use of the municipal water right applications, Cascade needed to purchase the more senior hydropower water right, the Lake Tapps Reservoir, the diversion dam, the flow line and related assets. By controlling both water rights, Cascade will maintain the flexibility to fully utilize the municipal water right applications without risk of regulatory curtailment during low water periods. Previous transactions in the region involved water rights capable of providing certain water supplies to the buyer. There are, however, substantial costs and risks associated with maintaining these assets. By way of example, maintaining the reservoir entails annual operation and maintenance costs of $1.5 to $3 million per year and future capital

investments are also required (e.g., repairs to Dikes 14 and 15, installation of valves in the powerhouse—estimated capital expenditures in the range of $8 to $15 million over the next five years). It is reasonable to assume (in light of the decision to retire the hydropower facility as an uneconomic operation) that the majority of these costs diminished the overall value of the municipal water right application. Furthermore, it is expected to be many years before the assets will produce an offsetting income stream. For example, Cascade anticipates commercial operation of its water supply facility in 2010 to 2025. The need to purchase and maintain these additional assets to obtain water supply certainty and the length of time before Cascade will earn revenues from the water supply facility lowers the value of the applications.

Conclusion:

At the request of PSE, WestWater Research assembled information on previous water right transactions in the Puget Sound region. In this analysis, WestWater Research compared the estimated unit price of PSE municipal water right applications to the range of unit values observed in other water right transactions. Based upon this review, it is WestWater Research's opinion that the proposed transaction price and terms for the municipal water right applications held by PSE are consistent with observed prices paid for other water rights in the region.

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Memorandum

To: Paul Wetherbee, Puget Sound Energy

CC: Mark Quehrn, Perkins Coie

From: Clay Landry, WestWater Research, LLC

Date: July 25, 2007

Re: DRAFT Preliminary Opinion of Proposed Sale Price of the Lake Tapps Water Rights

DRAFT

Dear Mr. Wetherbee:

The purpose of this memorandum is to provide a preliminary opinion on the proposed sale price of the Lake Tapps water right. This memorandum is not intended to provide an opinion of fair market value of the water rights. Rather, the memorandum reviews the proposed agreement and sale price between Puget Sound Energy (PSE) and Cascade Water Alliance (CWA).

Background

PSE and CWA have been negotiating the sale of Lake Tapps, which includes the dam, real estate and water rights. The two parties have been in negotiations in 2001 and recently reached agreement on key terms and conditions of the sale. In 2006, CWA and PSE signed an agreement for CWA to purchase the project, contingent upon PSE obtaining a municipal water right for the project, among other factors.

PSE owns and manages the White River Hydroelectric Project, which forms Lake Tapps. The water right for the hydropower project is based on claims of pre-code water use dating back to 1895. Under the claims, PSE has historically diverted up to 2,000 cubic feet per second (cfs) from the White River for hydropower production. In January 2004, PSE discontinued power generation. Since closing the hydropower project, PSE has continued to divert water as needed to maintain Lake levels in Lake Tapps and has released water from the project back into the river as a flushing or pass-through flow for the purpose of maintaining water quality.

PSE filed an application with the Washington State Department of Ecology in 2000 to establish a new water right for municipal use of 74,200 acre-feet (Application S2-29934). The application also requested a maximum instantaneous rate of diversion of 150 cfs. On September 25, 2006, Ecology issued a draft Lake Tapps Public Water Supply Project report of examination (ROE) for an informal review period by interested parties. Though this review was not required by law, there is considerable public interest in this project. The ROE provided for 61,400 acre-feet for public water supply (including industrial and commercial) and 11,000 acre-feet for source exchange.

Previous Valuation Analysis

During 2003, WestWater Research completed a series of analyses in support of PSE's negotiations with CWA. WestWater Research completed the following research in 2003 to assist PSE in price negotiations:

- Market consultation report: The report provided PSE with information on market prices and water right sales in the Puget Sound area. Additional information on municipal water right sales in other regions of Washington, western Oregon and northern California were also included to supplement limited regional market information.

- Regional Alternative Water Supply Analysis: This memo provided a comparison of alternative water supply options within the Puget Sound area. The analysis was intended to provide a basis for a development cost approach to value the Lake Tapps water rights.

- Seattle Public Utilities Rate Forecast Analysis: This analysis provided a cost comparison of the Lake Tapps water right sale to forecasted rates charged by Seattle Public Utilities. The purpose of the analysis is to compare the cost of CWA's water supply alternatives.

While significant valuation work was completed, WestWater Research did not complete an appraisal report providing an estimate of fair market value. Negotiations and contract terms were preliminary at the time the work was completed by WestWater Research.

Proposed Terms

The current proposed financial terms of the Lake Tapps sale as of May 17, 2007 are as follows:

- CWA will make an initial payment of $10,000,000 to be paid at closing.
- CWA will make an additional payment of $15,000,000 to be paid upon issuance of a water right ROE by the Washington Department of Ecology and prior to final resolution of the water right. The additional payment will be adjusted at a 5% annual interest rate from closing until final payment.
- CWA assumes the costs of litigating challenges to the ROE and the risk that the quantity water issued for public water supply is reduced as a result of successful challenges by third parties.

The proposed transaction terms are unique to the structure typically used in water right sales within Washington and the western United States. Most transactions utilize a contingency based structure where the total price is determined by the quantity of water approved for transfer. In addition, closing and payment generally occur once the appeals period for a regulatory decision is completed.

Review of Current Prices for Water Transactions

The market for water rights separate from other real property in western Washington remains relatively immature. Transaction activity is driven primarily by municipal, property development and mitigation needs in regions that are closed to new water appropriations. Consequently, most transactions involve relatively small volumes of water. Many of the recorded transactions have occurred in the southern Puget Sound region. The buyers in western Washington generally include: municipalities, private water purveyors, golf courses, real estate developers, and industrial developments.

WestWater Research maintains a database of water right sales and leases in Washington. The database contains information on transactions occurring from 1995 to the present. The majority of the water right sales have occurred in more recent years as population growth, environmental needs, and drought have stretched available water supplies in some parts of the state. This demand pressure is occurring in the Puget Sound region and is resulting in an increasing number of water right sales as water supply is reallocated to new uses.

For comparison purposes, approximately 40 permanent water right sales taking place in western Washington from 1995 forward were reviewed.[1] Table 1 provides a summary of water right transactions in western Washington. All reported prices have been adjusted using the Consumer Price Index (CPI) to reflect 2006 values. The majority of the transactions occurred during the period from 2002 to the present indicating that the sale and purchase of water rights within the region is increasing in frequency.

The reported transactions included purchases of both surface and groundwater right rights. Twelve of the reported transactions involved surface water rights totaling approximately 27,542 acre-feet of water traded. However, the majority of this quantity is represented by one major transaction. A total of twenty-six transactions representing more than 9,146 acre-feet involved groundwater rights. One large transaction involving 6,140 acre-feet comprised 67 percent of the total groundwater volume traded. The majority of both surface and groundwater right transactions involve relatively small quantities of water rights. Generally, transaction sizes range from 10 to 200 acre-feet indicating that the market demand and number of buyers that are able to utilize quantities of water comparable to the subject water rights is relatively limited.

Some of the reported transactions involved property developments seeking source supply for residential and commercial property projects. These transactions are generally small. While the subject water rights could conceivably be divided into smaller quantities consistent with sizes required by property development projects, the total volume of water currently required by this demand sector is small relative to the size of the Lake Tapps water rights. Use of the subject water rights for this purpose would require a lengthy market absorption period. It is unlikely that a real estate developer or group of developers would enter into a cash sale for the subject water rights given the length of time that would be required to fully develop the rights. Previous water right sales for development purposes have occurred as a result of more immediate water needs. As such, the primary demonstrated demand for the potential volume of water provided by the subject water right is municipal water providers in the region.

Recorded transaction prices varied widely with prices ranging from $65 to $5,869 per acre-foot. The wide price variation can be attributed to differences in water right characteristics, location, and the relatively undeveloped nature of the market. The average and median unit price for the selected transactions is $1,610 and $1,284 per acre-foot, respectively. Table1 provides summary statistics for all reported sales, surface sales only and groundwater sales only. In general, the market does not appear to be differentiating among water sources as prices paid for surface and groundwater sources have not shown significant variation.

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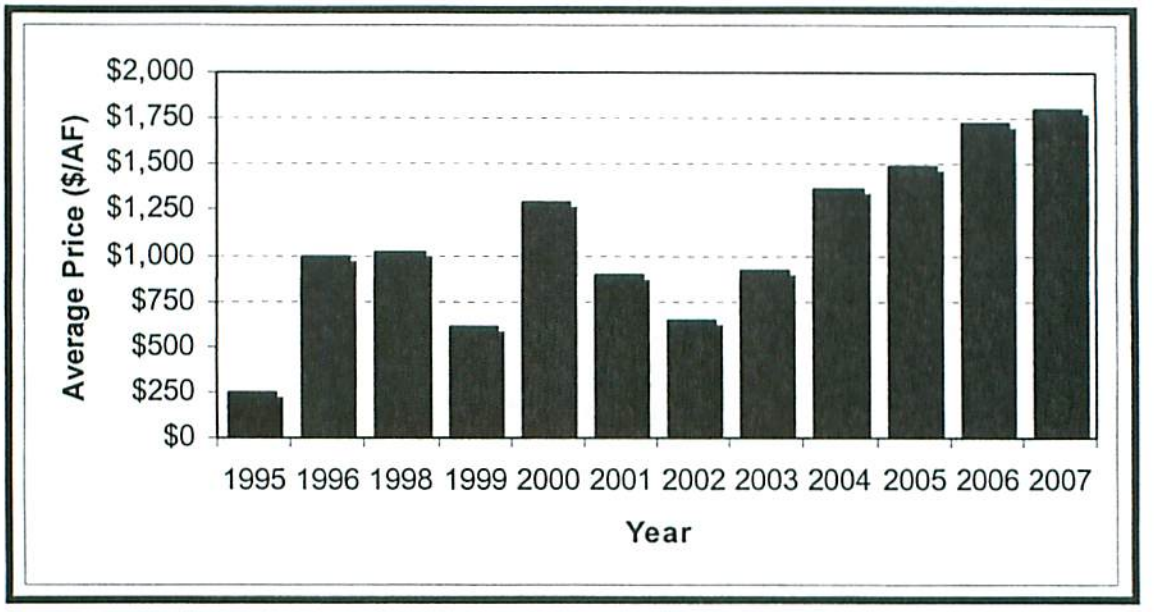
[1] A number of small individual transactions associated with the same water right were combined and are represented as a single sale in this analysis.

Table 1: Summary Statistics for Selected Water Right Transactions

All Water Right Sales	Volume (AF)	Unit Price ($/AF)
Mean	1,020.44	1,619.77
Median	56.25	1,296.09
Hi	26,565.00	5,869.36
Low	1.30	65.45
St Dev	4,516.96	1,343.37
Number	36.00	38.00
Surface Water Rights		
Mean	2,295.15	1,715.39
Median	80.00	1,435.67
Hi	26,565.00	5,000.00
Low	1.30	65.45
St Dev	7,643.37	1,314.94
Number	12.00	12.00
Groundwater Rights		
Mean	383.08	1,575.63
Median	48.73	1,104.19
Hi	6,721.00	5,869.36
Low	12.70	102.71
St Dev	1,354.87	1,379.74
Number	24.00	26.00

Price dispersion remains relatively wide both within and across different regions of the state. In general however, prices for water rights in Washington have been increasing in recent years. This trend is expected to continue due to continued population growth and environmental pressures. In addition, Washington water right prices remain low relative to many other states indicating that there remains significant opportunity for price appreciation in the market. Figure 1 provides average water right prices in Washington.

Figure 1: Average Water Right Prices, 1995 – 2007



Municipal Water Sales

The following section provides a summary review of municipal water sales within Western Washington. The included sales are limited to transactions occurring from the year 2000 forward. In addition, the transactions were limited to purchases of water rights by municipal buyers. Several of the sales reported in the table are in the approval process and represent negotiated total prices that are subject to change according to approved volumes transferred. However, the unit prices stipulated in the purchase and sale agreements are expected to remain unchanged.

In total, 13 permanent water right sales for municipal purposes have been recorded in western Washington. Unit prices range from $514 to $1,956 per acre-foot. Transaction volumes range from 30 to approximately 6,700 acre-feet. The median and average price for the transactions is $1,000 and $1,079 per acre-foot, respectively. As indicated, the sales primarily involve water rights with year-round periods of use, similar to the subject water rights. Furthermore, these transactions involved contingency contracts where the total price was based on the final and approved transferable quantity issued under a final ROE not subject to appeals. In addition, financial closing of the transactions occurred after the water right appeals period was completed. In contrast, the proposed transaction between PSE and CWA would require closing upon issuance of the ROE but prior to completion of the appeals period. Based on communications with Perkins Coie, it is our understanding that appeals by third parties are expected and could result in significant delays, costs, and potential changes to the quantity of water provided by the water right.

Large Transactions

The Lake Tapps transaction will be the largest water right deal in terms of volume within the Puget Sound region. In addition, only a limited number of large volume transactions have been successfully completed. The most recent and relevant transaction occurred in Pierce County in 2002 and involved approximately 6,725 acre-feet of groundwater rights held by Abitibi Consolidated.

Abitibi Water Rights Sale

The Abitibi sale involved three groundwater rights formerly used in pulp and paper operations at the Abitibi mill to Lakewood Water District. The three rights provided access to a combined total of 6,725 acre-feet of groundwater. A portion of the proposed transfer to Lakewood is pending approval from the Washington Department of Ecology. The terms of the transaction require a satisfactory approval of the water right transfer from the pulp and paper mill to the water district before closing occurs. This type of condition for closing is common for water right transactions. The first 4,750 acre-feet per year has been approved by Ecology with an amended ROE issued on September 27, 2005. The remaining portion of the transaction will be completed upon final approval by the Washington Department of Ecology. The final purchase price is determined based on the quantity of water approved for transfer. However, the terms were agreed upon in 2002 and included a unit price of $581 per acre-foot. The estimated total purchase price is approximately $3.9 million.

Summary

Due to the risk and uncertainty in the regulatory process, most water right sales involve payments that are contingent upon the quantity of water approved for transfer by Ecology. In general, contracts typically specify a unit price that is to be applied to the volume approved for transfer. The unit price presented in the market review reflects the negotiated price of water that is approved for transfer to the buyer. Unit prices are expected to be lower in circumstances where the buyer must acquire the water rights in full prior to the issuance of an ROE that is no longer subject to an appeal. The proposed terms in the PSE – CWA transaction requires final payment upon issuances of the ROE but prior to completion of any appeals. Consequently, the proposed structure envisions a sale of the water rights "as is" where CWA accepts the financial risk associated with the uncertainty regarding transferable volume. Currently, the terms of the draft ROE remain controversial among various groups with divergent interests. Specifically, this includes

two Indian tribes with substantial resources invested in opposing the water right and several municipalities and the community that surrounds the lake.

It is my opinion that general market price for large volume transactions completed for public water supply is $500 to $1,000 per acre-foot. Again, these values reflect contingency type contracts where the final purchase price and closing is conditioned on issuance of an ROE not subject to an appeal. Consequently, the price range should be adjusted to reflect the risk associated with the "as-is" terms of the proposed transaction.

The following assumptions are made for the purpose of this letter review:

- The total transferable and marketable quantity of the water right Application S2-29934 is 61,400 acre-feet.
- The total transaction price for the attributed to the water rights is $15,000,000 (adjusted at 5 percent annually until an ROE is issued).

Based on these assumptions, the estimated unit price of the proposed transaction is approximately $244 per acre-foot. This represents approximately a 50 to 75 percent discount when compared to current market prices for contingency type contracts.

It is the appraiser's opinion that the proposed price for the water right application of $15 million appropriately balances the risk to the buyer with market values for water rights established through contracts where the level of payment is contingent upon the volume of water approved for transfer.

This review is not intended to serve as a fully self-contained water right appraisal. Completion of a full appraisal estimating the total fair market value of the water rights is necessary to render an opinion of fair market value of the Lake Tapps water right application. The appraisal report would include additional research regarding the transferability and marketability of the water right application among other considerations. Given the geographic location and large volume of water provided by the right, an assessment of the market absorption period would also be of particular importance. This memorandum also does not address specific legal characteristics, risks and operational costs and liabilities associated with the ownership and development of the Lake Tapps water right application. It is my understanding that these costs are considerable, and therefore, should be quantified and factored into an opinion of fair market value. Priority date, withdrawal rate and volume, source, and previous use can affect the value of water rights. In addition, water quality can also represent an important value consideration in circumstances where the quality of the underlying water resource limits potential new uses of the water right or requires costly treatment prior to use. Consequently, this memo is limited to a general comparison of the terms set forth in the proposed agreement between PSE and CWA and general market conditions.