

May 2, 2008

The Honorable Julia Patterson
Chair, King County Council
Room 1200
C O U R T H O U S E

Dear Councilmember Patterson:

I am pleased to present the January 2008 Brightwater Cost Update Report which is the seventh in a series of annual reports to inform the King County Council and its committees about trends and conditions that may impact the cost of the Brightwater project. This report presents the lifetime cost estimate for the project as of January 2008, reviews the project's scope and accomplishments, explains the cost changes since last year, and describes remaining uncertainties that may impact the project.

The Department of Natural Resources and Parks (DNRP) and its consultants and contractors accomplished a significant amount of work on the Brightwater project in 2007:

- Completed negotiations of the Guaranteed Construction Cost with Hoffman Construction to construct the liquids facilities at the treatment plant
- Awarded contract to Kiewit-Pacific for the solids/odor control facilities
- Launched a tunnel boring machine (TBM) from North Creek to the Brightwater Treatment Plant (East Tunnel)
- Launched a TBM from Kenmore to North Creek (Central Tunnel)
- Completed mobilization and began TBM fabrication for the West Tunnel
- Awarded a contract and notice to proceed for procurement for the Influent Pump Station
- Signed a land transfer agreement with the City of Kenmore to create 26 acres of public park land
- Obtained all building permits from Snohomish county for the treatment plant site and made a mitigation payment of \$17.5 million

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As a result of these and other accomplishments, the Brightwater project is scheduled to become operational in early 2011. As of January 2008, the estimated lifetime cost of Brightwater is \$1.8 billion. This amount represents an increase of about \$34.9 million, or about two percent, over the estimate presented in January 2007.

This cost estimate reflects the award of over 98 percent of the construction work for the project. Now that the majority of construction costs are fixed, we can estimate the total cost of the Brightwater project with much greater certainty than was possible a year ago. However, the uncertainties facing the project now shift from inflation and contractor bid prices to unforeseen circumstances during construction, such as the discovery of contaminated soil or geotechnical constraints during tunneling. These and other risks carry the potential for cost increases above the original contract prices. The Department of Natural Resources and Parks has a comprehensive strategy to mitigate risks and contingencies to cover cost increases, but it is important to recognize that unexpected events could increase the time and cost of completing the work under each contract.

Please note that the report is dated January 2008, because that is the month cost numbers are locked down so that the annual wastewater budget and rate can be prepared. This process lasts until early April, which is when this report was completed. If you have any questions, please feel free to contact Christie True, Division Director of the Wastewater Treatment Division of the Department of Natural Resources and Parks, at 206-684-1236.

Thank you for your review of this annual report. I look forward to continuing to work together on this critically important project.

Sincerely,

Ron Sims
King County Executive

Enclosure

cc: King County Councilmembers
 ATTN: Ross Baker, Chief of Staff
 Saroja Reddy, Policy Staff Director
 Anne Noris, Clerk of the Council
 Frank Abe, Communications Director
Regional Water Quality Committee Members
Bob Cowan, Director, Office of Management and Budget
Theresa Jennings, Director, Department of Natural Resources and Parks (DNRP)
Christie True, Division Director, Wastewater Treatment Division, DNRP

Brightwater Cost Update

Current Conditions and Trends

January 2008



King County

Department of
Natural Resources and Parks
Wastewater Treatment Division

This information is available in alternative formats upon request by calling 206-684-1280 (voice) or Relay Service 711 (TTY).

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Executive Summary

The Brightwater Cost Update is part of an ongoing effort by the King County Department of Natural Resources and Parks (DNRP) to inform decision makers and stakeholders about trends and conditions that may impact the cost of the Brightwater project. This report describes current trends through January 2008, identifies the costs associated with these trends, and compares costs to those presented in the *January 2007 Update*. This report concludes with a discussion of the remaining uncertainties facing the Brightwater project through the end of construction and their potential affect on final project costs.

Cost Estimates to Date

To date, King County DNRP has prepared seven cost estimates for the Brightwater project, each at key points in the project's lifecycle. The first estimate was a conceptual estimate developed in 2001 as part of the Brightwater siting analysis. The second and third estimates were released in 2002 and 2003 as part of the Draft and Final Environmental Impact Statements, respectively. These two estimates were based on the current Brightwater system configuration and included preliminary design information for the treatment plant and conveyance system. The fourth estimate was presented in October 2004 at the completion of 30 percent design. This estimate was subsequently adopted by the Council as the project's baseline budget. The fifth estimate, prepared in December 2005, reflected the completion of 60 percent design for the treatment plant and 100 percent design for much of the conveyance system. The sixth cost estimate, prepared in January 2007, described the project's transition from design to construction, a change that also necessitated a shift from constant (base year) dollars to nominal (inflated) dollars as a significant portion of the project's construction costs were established by contracts that included inflation. The seventh and current cost estimate reflects the project's near complete transition to construction, with over 98 percent of the construction contracts awarded. It also includes actual costs incurred through 2007.

Current Cost Estimate

As of January 2008, the current lifetime cost estimate for the Brightwater project is \$1.8 billion, which is \$34.9 million, or about 2 percent, above the cost estimate presented in the *January 2007 Update*, as shown in Table 1.

Table 1
Comparison of Brightwater Cost Estimates since January 2007 (millions)^a

Brightwater Component	Jan. 2007 Inflated	Jan. 2008 Inflated	Change Jan. 07–Jan. 08	Percent Change	January 2007 Inflated OMC Estimate
Treatment Plant	\$839.8	\$875.3	\$35.5	4.22%	\$882–\$911
Conveyance	\$927.5	\$926.9	\$(0.5)	-0.06%	\$ 946–\$953
Total	\$1,767.3	\$1,802.2	\$34.9	1.98%	\$1,827–\$1,862

^aTotals may not add due to rounding.

Table 1 also shows the range of lifetime costs estimated by R.W. Beck, the Brightwater project's independent Oversight Monitoring Consultant (OMC), following their review of the *January 2007 Update*. Note that the January 2008 estimate is below the costs estimated by the OMC, which may suggest that DNRP's estimates are less conservative. In fact, the cost estimates reflect the level of certainty available at the time of the estimate, and DNRP aggressively manages the project to meet those estimates. And while current uncertainties may result in future cost increases to the project, DNRP does not reflect the possible cost to mitigate these uncertainties in the Brightwater estimates. This practice is consistent with county policy to set the lowest reasonable wastewater monthly rate and capacity charge, and the Brightwater cost estimates have a significant impact on these charges.

Current Estimate Compared to the Baseline Budget

The October 2004 Brightwater cost estimate of \$1.483 billion (2004 dollars) was used to develop the baseline budget for the Brightwater project. Table 2 shows the baseline budget forecasts in October 2004, with inflation at 3 and 5 percent per year, and the current Brightwater estimate of \$1.8 billion projected with inflation; Figure 1 compares the Brightwater estimates to date against the baseline budget with 5 percent inflation.

Table 2
Brightwater Baseline Costs Compared to the January 2008 Estimate (millions)^a

Brightwater Component	Baseline Cost (2004\$)	Baseline Cost with 3% inflation	Baseline Cost with 5% inflation	January 2008 Inflated
Treatment Plant	\$578.4	\$639.6	\$684.4	\$875.3
Conveyance	\$904.7	\$1,020.5	\$1,105.5	\$926.9
Total	\$1,483.1	\$1,660.1	\$1,789.9	\$1,802.2

^aTotals may not add due to rounding.

Figure 1
Brightwater Cost Estimates (Inflated): 2001–2008

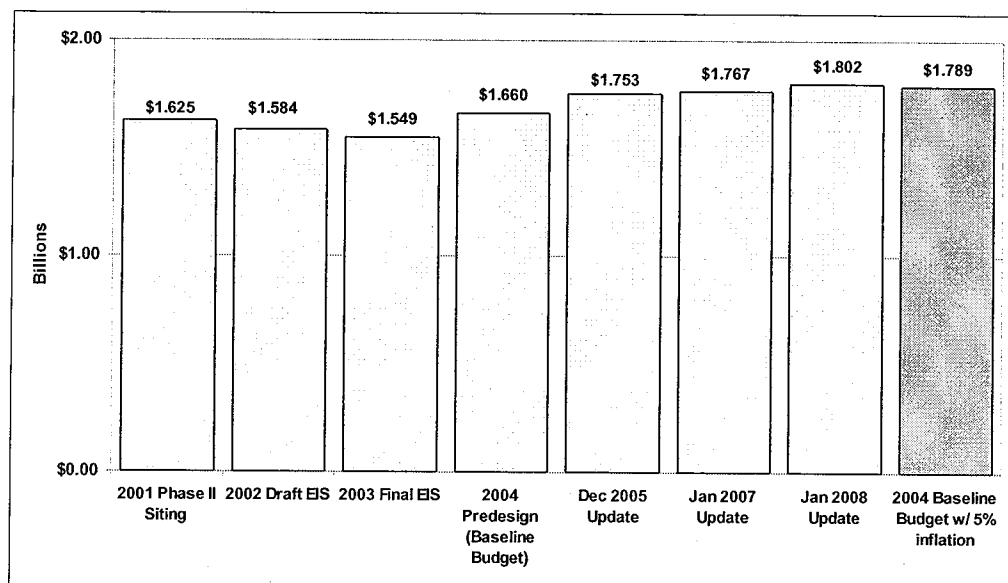


Figure 1 shows that the current cost estimate is slightly above the baseline budget forecasted in 2004 with 5 percent inflation. This is consistent with a prediction made in the October 2004 predesign cost estimate, which suggested that, given the significant increases in commodity prices at that time, an inflation assumption of 5 percent might better reflect future conditions.¹ This prediction was borne out by actual inflation experienced over the last two years in construction-related markets. A comparison of cash flows for the current cost estimate and the approved Brightwater baseline budget is provided in Appendix A.

Inflation

Inflation is an increase in the level of prices over time that results in a decrease in purchasing power compared to today's dollars. Since 2004, inflation has significantly affected projects across the country including Brightwater, adding approximately \$263 million to project costs between 2004 and 2006. Overall, construction inflation has averaged 4.5 percent per year from 2004 through 2007 as measured by the Engineering News Record's Construction Cost Index (CCI). This average masks a volatile period in which annual price increases ranged from 6.3 percent in 2004 (an annual average that included double-digit increases for several commodities important to Brightwater) to 2.8 percent in 2007. Construction prices moderated in 2006 and 2007, though the effects of such volatility can extend beyond the actual inflationary episode manifested as higher contractor bids, particularly for contracting methods where contractors are bound by guaranteed construction costs.

Cost Changes since January 2007

Compared to the *January 2007 Update* there was an overall increase of about \$35.5 million in treatment plant costs and an overall decrease of about \$0.5 million in conveyance costs. These changes result in a net increase in Brightwater costs of about \$34.9 million. Several factors contributed to the cost changes as summarized below and explained in more detail in the section titled "*Cost Changes since January 2007.*"

Treatment Plant

Table 3 lists the significant cost changes for the treatment plant since January 2007. In terms of construction costs, the table shows that the results from two separate bidding processes contributed to the majority of the treatment plant cost increases over the previous year: the bids for the Solids Contract came in higher by about \$11.5 million and the subcontractor bids for the Liquids Contract came in higher than estimated by about \$7.8 million. These increases reflected the impacts of inflation on the local construction market as well as the very heated bidding environment created by the abundance of available construction work in the region. The increases in bid costs were accompanied by an associated increase in sales tax of \$5.2 million. An additional increase of \$2.2 million was attributed to costs incurred by Snohomish County Public Utility District in upgrading the substation being built to serve the Brightwater Treatment Plant.

¹ King County Department of Natural Resources and Parks. Brightwater Facilities: Addendum to August 23 Report: Brightwater Predesign Cost Estimates. October 2004. p. 20.

Table 3
Brightwater Treatment Plant Cost Changes since January 2007 (millions)^a

Treatment Plant Element	January 2007 Inflated	January 2008 Inflated	Change Jan. 07–Jan. 08
Construction Costs			
Liquids Contract	\$215.3	\$223.1	\$7.8
Solids Contract	154.9	166.5	11.5
Construction Contingency	38.3	33.1	(5.2)
Sales Taxes	30.2	35.4	5.2
Owner Furnished Equipment	31.2	28.5	(2.6)
Outside Agency Costs	4.6	6.8	2.2
All Other Construction Costs	56.3	57.5	1.2
Non-Construction Costs			
Engineering Services	66.2	76.5	10.2
Project Contingency	4.0	2.0	(2.0)
Credits and Revenues	(10.6)	(3.2)	7.4
All other changes	249.5	249.1	(0.4)
Total	\$839.8	\$875.3	\$35.5

^aTotals may not add due to rounding.

Non-construction costs also contributed to treatment plant increases but to a lesser degree. Engineering services needs were further refined over the first year of actual construction and resulted in a \$10.2 million increase that reflected the need for additional engineering services during construction, construction management staffing, and materials testing. Finally, the amount of the anticipated revenues to be received from the sale of salvaged Stockpot company equipment was less than expected.

Conveyance System

Cost changes for the conveyance system are shown in Table 4. Construction costs were impacted primarily by higher-than-expected bids for the Influent Pump Station (IPS), with the low bid coming in about \$20 million above the estimate presented in the *January 2007 Update*. This increase is largely attributable to the same inflationary pressure affecting the treatment plant bids. The increase in IPS costs was offset somewhat by a favorable bid for the Marine Outfall, which came in \$4.4 million below expectations. The primary change in non-construction costs was a reduction of \$12 million in project contingency, which largely offset the conveyance cost increases experienced during 2007. King County DNRP believes that the remaining project risks are sufficiently reduced at this point to justify a reduction in project contingency. The remaining project contingency combined with the available construction contingency should provide sufficient reserves to address any anticipated risks that may arise during construction.

Table 4
Brightwater Conveyance Cost Changes since January 2007 (millions)^a

Conveyance Element	January 2007 Inflated	January 2008 Inflated	Change Jan. 07-Jan. 08
Construction Costs			
East, Central, West, Ancillary Contracts	\$450.7	\$455.5	\$4.8
Influent Pump Station (IPS) Contract	71.5	91.5	20.0
Marine Outfall Contract	27.8	23.4	(4.4)
Construction Contingency	72.7	68.6	(4.2)
Sales Taxes	55.8	57.2	1.4
All Other Construction Costs	29.1	27.3	(1.8)
Non-Construction Costs			
Engineering/Planning & Mgmt. Services	133.1	130.7	(2.5)
Project Contingency	18.2	6.2	(12.0)
All Other Non-Construction	68.5	66.6	(1.9)
Total	\$927.5	\$926.9	(\$0.5)

^aTotals may not add due to rounding.

Uncertainties Potentially Affecting Cost

During the past year, DNRP and its consultants and contractors made significant progress on the Brightwater project. One important achievement was the award of over 98 percent of the construction work for the project. Because these construction costs are now fixed, DNRP can estimate the total cost of the Brightwater project with much greater certainty than was possible a year ago. However, the uncertainties facing the project now shift from concerns about inflation and contractor bids to risks during construction, such as large change orders and claims associated with as unforeseen ground conditions and in the completion of construction at interfaces between contractors. Another area of uncertainty is the necessary level of engineering services during construction, construction management staffing, and materials testing. Staffing needs will be assessed periodically as construction progresses to ensure that there is enough engineering support and field oversight to assure proper construction and documentation.

Format for Presenting Costs

The format for presenting the Brightwater cost estimates has changed over time to reflect the maturing of the project and to better address the needs of the report's end users. Prior to 2006, Brightwater cost estimates were presented in constant dollars; that is, dollars adjusted for inflation (deflated) to the year of the estimate. With the project's transition from design to construction in 2006, the cost format shifted to nominal (inflated) dollars to account for the fact that contractors included inflation as part of their bid packages. Following issuance of the *January 2007 Update*, the Brightwater Oversight Monitoring Consultant (OMC) recommended modifications to the cost format to insure costs could be compared year to year. Consequently, DNRP proposed using the Brightwater Monthly Report format adopted by the Council in 2005, which used nominal dollars to include inflation. The costs presented in this report reflect this revised format.

Introduction

This update is part of an ongoing effort by the King County Department of Natural Resources and Parks to inform decision makers and stakeholders about the effect of current conditions and trends on the costs associated with the Brightwater project. This report is organized in five sections. This *Introduction* provides a summary of the Brightwater facilities and the effort to mitigate Brightwater impacts. It also describes what was accomplished in 2007 and highlights what we expect to accomplish in 2008. The next section, *Developing the Brightwater Cost Estimates*, reviews each of the Brightwater cost estimates to date, including a summary of the major changes between estimates. This section also describes the impact of inflation on the cost estimates, the change in format for presenting the estimates, and the recommendations of the independent Oversight Management Consultant. The detailed Brightwater cost estimates are then presented in the section titled *Brightwater Cost Estimates*. The fourth section, *Cost Changes since January 2007*, describes the factors that contributed to cost changes since last year's estimate, and the final section, *Uncertainties Potentially Affecting Cost*, identifies issues that may affect Brightwater costs in the coming year.

The Brightwater Project

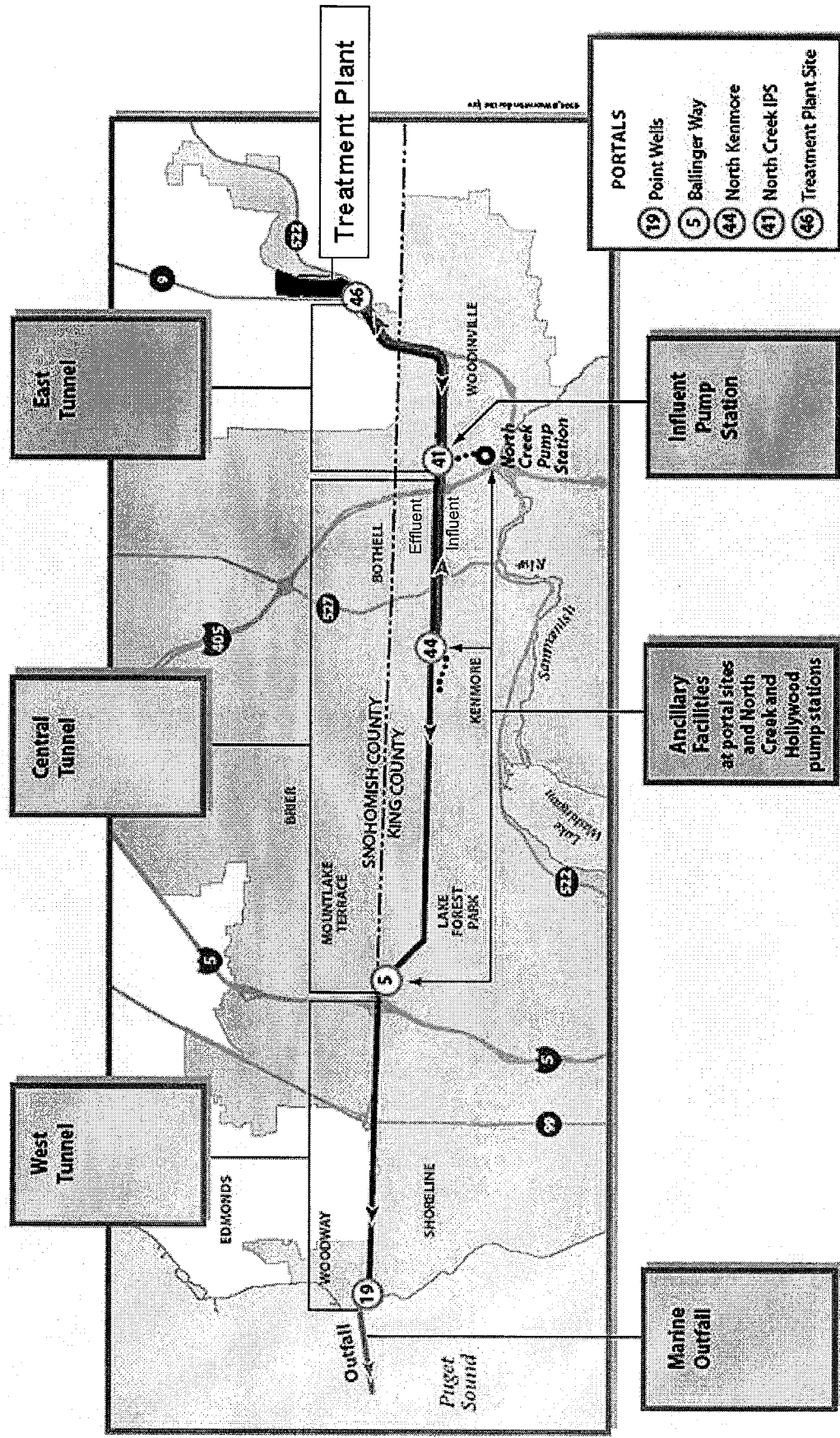
The 1999 Regional Wastewater Services Plan identified the need for a 36 million gallon per day (mgd) treatment plant and associated conveyance facilities to provide wastewater capacity for the north service area by the year 2010. These facilities, currently under construction and collectively termed Brightwater, are shown on Figure 2 and summarized below.

Treatment Plant

The treatment plant site is located in unincorporated Snohomish County east of State Highway SR-9, just north of the intersection of SR-9 and SR-522 and the City of Woodinville. When the treatment plant begins its start up and commissioning process in the winter of 2010, it will have a capacity to treat 36 million gallons per day of wastewater with a peak flow capacity of 130 mgd. This facility will be designed in such manner that it can be further expanded in 2040 to continue serving the region's needs. Its capacity at that time would be 54 million gallons per day with a peak capacity of 170 mgd. The treatment plant will provide secondary treatment using aeration and membrane bioreactor (MBR) facilities, which also allow the county to provide advanced treatment for up to 21 mgd of Class A reclaimed water for irrigation and industrial use.

The plant will recycle solids using anaerobic digestion and centrifuge dewatering to generate Class B biosolids that will be used for agricultural and forestland application, and compost production. Methane gas generated during the solids handling process will be used to fuel plant process heating. The Brightwater odor control system is designed to achieve the nation's most stringent odor control standards. To achieve these standards, the plant will employ a multiple-phase treatment system involving biological and chemical treatment followed by carbon polishing.

Figure 2
Major Components of the Brightwater Project



The treatment plant site will be landscaped to provide visual buffering from the surrounding community. An environmental education/community center will be located on site with 71 acres of publicly accessible open space and trails. Extensive stormwater control facilities are being constructed which will significantly reduce storm water runoff volumes and improve runoff quality to Little Bear Creek running parallel to the west side of the plant site.

Conveyance System

The conveyance system is comprised of six major components. These are the East Tunnel, Central Tunnel, West Tunnel, Influent Pump Station, Marine Outfall, and Ancillary Facilities.

East Tunnel

The East Tunnel Contract was awarded to the Joint Venture of Kenny/Shea/Traylor in December 2005 for \$131 million. The contractor is constructing 14,050 feet of 16.6-foot internal diameter tunnel between the Brightwater Treatment Plant and the North Creek Business Park in Bothell. Approximately 1000 feet of tunnel has been completed to date. The contractor has completed construction of the 74-foot diameter 80-foot deep portal shafts at North Creek from which the tunnel boring machines (TBM) was launched. The twin 84-foot diameter 83-foot deep shaft for the influent pumping station is well under construction, and construction of a 2,400-foot microtunnel to the existing North Creek Pump Station should be completed by summer 2008.

Central Tunnel

The Central Tunnel Contract was awarded to the Joint Venture of Vinci/Parsons RCI/Frontier-Kemper in July 2006 for \$211 million. The contractor is constructing two 14-foot 4-inch internal diameter tunnels: one tunnel 11,600 feet long from Kenmore to the North Creek Business Park in Bothell and another 20,100 feet long from Kenmore to Ballinger Way in Shoreline. Two separate TBMs are boring these tunnels from a common 90-foot deep and 54-foot wide portal shaft constructed at Kenmore. Approximately 1200 feet of the eastbound tunnel has been completed and 250 feet of the west bound tunnel. The contractor is constructing a 205-foot deep 21-foot diameter TBM retrieval shaft on Ballinger Way which will be completed this summer. The contract also includes approximately 3,400 feet of 72- and 36-inch diameter pipeline and microtunnel to connect to the existing wastewater system. This work was completed in the summer of 2007.

West Tunnel

The West Tunnel Contract was awarded to the Joint Venture of Jay Dee/Coluccio/ Taisei in October 2006 for \$102 million. The contractor will construct about 21,100 feet of 12-foot internal diameter tunnel from Point Wells in unincorporated Snohomish County to the Ballinger Way portal shaft. The contractor is constructing a 50-foot deep rectangular portal at Point Wells to launch the TBM in May of this year. The 550 feet of 60-inch diameter pipeline connecting the tunnel to the marine outfall has been completed in the spring of 2008.

Marine Outfall

The Marine Outfall contractor will construct the 5,400-foot outfall from the end of the Marine Outfall Connector (built under the West Tunnel contract) to a depth of 600 feet in Puget

Sound. The end of the outfall pipe consists of a 500-foot long diffuser section designed to effectively and efficiently disperse treated effluent into Puget Sound. The \$28 million project is being constructed using the design-build contracting method. DNRP's selected design-build contractor is Triton Marine Construction Corporation from Bremerton, Washington, and Triton's lead designer is Dayton & Knight Engineering from North Vancouver, British Columbia. The team was given a notice to proceed on October 17, 2007, and has now submitted final design for the outfall. Construction of the outfall is scheduled for the summer of 2008.

Influent Pump Station

The Influent Pump Station, located at the North Creek Portal, is initially designed to pump up to 130 million gallons per day (mgd) of wastewater influent during peak flow conditions to the Brightwater Treatment Plant. The contract work will include build out of the existing shaft (excavated as part of the East Tunnel Contract) including three below grade floors for pumping equipment, a 10,000 square-foot above-grade building with two floors, and four variable-speed pumping units (two 20-mgd and two 45-mgd units). The contract will also include construction of a generator building containing three diesel generators to provide backup power and an odor control facility. Kiewit Pacific was selected to perform the work in June 2007. Work performed to date has focused on equipment procurement with active construction of the building itself beginning late this year.

Ancillary Facilities

There are three sets of ancillary facilities contracts as part of the Brightwater project. One is the North Creek Facilities, which is currently in construction and includes flow diversion structures, reclaimed water facilities, flow monitoring equipment installation, and odor control. Another contract is the Hollywood Facilities, which is also under construction and includes building a 450 square-foot chemical injection facility with a storage tank, feed pumps, a containment structure, electrical and control work, and a standby generator. The third, the North Kenmore and Ballinger Way Odor Control Facilities, is still in design. It involves the installation of odor control equipment and landscaping at the Ballinger Way portal. Construction is scheduled to begin in early 2009.

Mitigation

Mitigation refers to the various measures taken to address construction and operational impacts and enhance the community that hosts a development project. There are a total of five construction sites that make up the Brightwater project, including the treatment plant site, three conveyance portals, and a fourth combined portal and marine outfall location adjacent to Puget Sound. To address the possible impacts of Brightwater construction and operations, DNRP has negotiated twelve mitigation agreements with cities, tribal governments, jurisdictions, and local utilities at a cost of \$148.6 million. These agreements include funding to address traffic impacts on local roadways, commitments to install additional landscape plantings to buffer views, the transfer of land to a local community for public parkland after it is no longer needed for construction purposes, and the restoration of salmon habitat among a number of additional mitigation measures. All elements of the mitigation program are currently on schedule and the total mitigation budget of \$148.6 million remains the same as presented in the *January 2007 Update*.

Accomplishments in 2007

King County DNRP and its consultants and contractors completed a significant amount of work on the Brightwater project in 2007. Some of the specific accomplishments for the treatment plant and conveyance system are listed below.

Treatment Plant

- Completed negotiations of the Guaranteed Construction Cost (GCC) with Hoffman Construction for the liquids stream facilities
- Awarded a contract to Kiewit-Pacific for the solids/odor control facilities
- Issued final acceptance for the Site Preparation Contract
- Began site earthwork in preparation for tank and gallery foundations
- Began concrete work for the grit, headworks, and primary galleries
- Completed site preparation for the solids/odor control facilities
- Completed detailed design for instrumentation and control systems
- Completed Brightwater Operation Center (BOC) Tenant Improvement Contract

Conveyance System

- Launched a tunnel boring machine (TBM) from North Creek to the Brightwater Treatment Plant (East Tunnel)
- Completed the Swamp Creek microtunnel (Central Tunnel)
- Launched a TBM from Kenmore to North Creek (Central Tunnel)
- Completed mobilization and began TBM fabrication for the West Tunnel
- Awarded a contract and issued Notice to Proceed (NTP) for procurement for the Influent Pump Station
- Negotiated a design-build contract and issued NTP for the Marine Outfall
- Issued a NTP for North Creek and Hollywood (Ancillary Facilities)

Mitigation

- Completed construction and final acceptance of the North Mitigation Area
- Obtained building permit for the Environmental Education/Community Center (EECC)
- Signed Richmond Beach Pump Station Surface Use Agreement with the City of Shoreline to create a community park
- Signed Land Transfer Agreement with the City of Kenmore to create 26 acres of public park land
- Received \$675,000 in state grant funds to complete green design and interior design of the EECC
- Issued a request for proposal to procure landscape plant material for the treatment plant site
- Obtained all building permits from Snohomish County for treatment plant site and made a mitigation payment of \$17.5 million

Expected Accomplishments in 2008

Table 5 shows the expected completion of major milestones for each of the main components of the Brightwater project in 2008.

Table 5
Expected Accomplishments for the Brightwater Project in 2008

2008 Activity	Expected Completion
Treatment Plant	
• Mobilize Instrumentation & Control (I/C) Implementation Team to meet established milestones for deliverables in the Emerson Contract	February
• Mobilize solids/odor control contractor to initiate construction	March
• Complete demolition of the OPUS Building	March
• Complete buyout of the Liquids Contract	June
Conveyance System	
East Tunnel	
• Complete North Creek Connector	May
• Complete East Tunnel	November
Central Tunnel	
• Begin west bound tunnel construction	March
West Tunnel	
• Begin tunnel construction	May
Influent Pump Station	
• Begin IPS construction	November
Marine Outfall	
• Complete construction	November
Ancillary Facilities	
• Complete Hollywood Pump Station interim commissioning	May
Mitigation	
• Award Landscape Plant Material Growing Contract	April
• Purchase of 144 acres of public park and recreational lands	March
• Award Landscape Installation Contract for treatment plant site	October
• Award Environmental Education / Community Center (EECC) construction contract	October
• Transmit final Snohomish County mitigation payment for \$16.05 million.	October

Developing the Brightwater Cost Estimates

Cost estimating is an important part of managing the Brightwater project and of keeping decision makers informed about trends and conditions that could potentially affect the project's cost. This section begins with a review of the Brightwater cost estimates issued to date, including a summary of the factors responsible for cost changes between prior estimates and a review of inflation and its impact on Brightwater costs. The section continues with a review of how costs are estimated under the different types of construction contracting methods used on the Brightwater project. It concludes with a discussion of how costs are controlled through independent oversight.

Cost Estimates to Date

Since the Brightwater siting process began in 2000, DNRP has prepared seven cost estimates including the one presented in this report. Each estimate incorporates additional information that has increased the amount of certainty about the final cost of the Brightwater project. The previous six cost estimates are summarized below; the primary drivers of cost changes between estimates are presented in Table 6.

The first Brightwater estimate of \$1.35 billion, prepared in 2001, was derived largely from using historical cost data for comparable wastewater facilities—a method termed conceptual estimating. Conceptual estimates are intended to provide a relatively quick and cost effective method of predicting the approximate cost of the project without the benefit of detailed design drawings. This estimate was used to assist decision makers in selecting among treatment plant site alternatives.

The second and third estimates were released in 2002 and 2003 as part of the Draft and Final Environmental Impact Statements (EIS), respectively. Some preliminary design information was available for portions of these estimates; however, certain elements continued to be estimated using conceptual estimating techniques, particularly for the treatment plant. Both EIS estimates remained at \$1.35 billion. This was accomplished in part by rigorous application of value engineering and design refinements, ultimately offsetting about \$82 million in inflation-generated cost increases during that period.

The fourth Brightwater cost estimate of \$1.483 billion was presented in October 2004 at the completion of 30 percent design.² This estimate represented the first design-based estimate, which improves accuracy significantly over a conceptual estimate though at much greater cost. The October 2004 predesign estimate increased by about \$133 million over the EIS estimates, largely due to extraordinary increases in prices for construction commodities experienced that year. This estimate was used to develop the baseline budget for the Brightwater project that was approved by council in August 2005.

² King County Department of Natural Resources and Parks. Brightwater Facilities: Addendum to August 23 Report: Brightwater Predesign Cost Estimates. October 2004.

Table 6
Brightwater Cost Estimates: 1998–2007: Primary Drivers of Cost Changes

Base Year	Brightwater Cost Estimate	Constant (base year) Dollars (millions)	Nominal (inflated) Dollars (millions)	Primary Drivers of Cost Changes
2001	Brightwater Phase II Siting Estimate	\$1,332	\$1,625	<p><u>Conveyance cost increases</u></p> <ul style="list-style-type: none"> • Preferred Brightwater site was located about 13 miles inland from Pt. Wells, which required an additional effluent pipe and influent pipe over previous concepts • Outfall was longer and deeper in Puget Sound • Conveyance tunnel required intermediate portals and structurally reinforced tunnel segments • Land for portals and easements <p><u>Treatment plant cost increases</u></p> <ul style="list-style-type: none"> • New treatment technologies were utilized • Odor control levels were increased significantly, requiring additional facilities • Treatment optimization at peak flow added • Plant site increased from 40 to 100 acres per Council direction
2002	Brightwater Draft EIS Estimate	\$1,349	\$1,584	Route 9 treatment plant location selected for evaluation in EIS; conveyance costs decrease due to ~3 miles less tunnel and fewer portals; treatment plant costs increase due to increased odor control and Influent Pump Station (IPS) at the treatment plant
2003	Brightwater Final EIS Estimate	\$1,349	\$1,549	Treatment plant costs decrease due to shift of IPS to North Creek; Conveyance costs increase due to IPS; overall costs remain stable
2004	October 2004 Brightwater Predesign Estimate (Baseline Budget)	\$1,483	\$1,660 ^b	<p><u>Council-adopted Baseline Budget for Brightwater. Cost increases</u></p> <ul style="list-style-type: none"> • 95 percent of increase was due to inflation, including premium inflation on labor and commodities • Treatment plant increase due to replacing ballasted sedimentation with chemically enhanced primary clarification; increasing the number of odor control units, and revising grit handling process • Conveyance costs increase due to revised (lowered) tunneling productivity and stronger Tunnel Boring Machines (TBMs) resulting from better geotechnical information <p><u>Cost increases due to three main factors of approximately equal value</u></p> <ul style="list-style-type: none"> • inflation (including contractor markups) • Treatment plant increases due to underestimation of material quantities and design refinements of headworks, odor control, aeration basins, and instrumentation & control (I&C) • a significant increase in mitigation payments
2005	December 2005 Brightwater Cost Estimate	\$1,621	\$1,753 ^b	
2007	January 2007 Brightwater Cost Estimate	NA ^a	\$1,767 ^c	<p><u>Cost Increases</u></p> <ul style="list-style-type: none"> • Inflation, both general and premium (accounted for 70 percent of construction cost increases) • Treatment plant costs (inflation, insurance, design refinements, new contracting package for solids) • Conveyance system (inflation, insurance costs)

^a Constant dollars were not used in the January 2007 Update.

^b Inflated at 3 percent per year.

^c Actual costs through 2007 plus awarded contract costs; remaining future costs inflated at 3 percent per year.

The fifth Brightwater cost estimate of \$1.621 billion was prepared in December 2005.³ This estimate incorporated actual construction bids for the East Tunnel, the 60 percent design estimates for the Central Tunnel and Influent Pump Station, and the 30 percent design estimate for the West Tunnel. It also included the 60 percent design treatment plant cost estimate by the plant's general contractor/construction manager. The \$138 million increase in the project's total cost was due to extraordinary inflation on construction commodities, increased mitigation costs, and treatment plant design refinements.

The sixth cost estimate, prepared in January 2007, marked a change in the way DNRP presented cost estimates from constant dollars (dollars whose present value were linked to the year of the estimate) to nominal dollars, which included inflation. This change corresponded with the project's transition from design to construction and the fact that the majority of the project's construction costs were now fixed by contractor bids that included inflation. Compared to the December 2005 estimate, the January 2007 estimate of \$1.767 billion represented an overall increase of about \$14 million.

Inflation

Inflation is an increase in the level of prices over time that results in a decrease in purchasing power compared to today's dollars. While the baseline forecast in late 2004 estimated inflation at 3 percent per year, in line with WTD's long-term rate, actual overall construction inflation has averaged 4.5 percent per year from 2004 through 2007 as measured by the Engineering News Record's Construction Cost Index (CCI). This annual average masks a volatile period in which price increases ranged from 6.3 percent in 2004 to 2.8 percent in 2007.

General Inflation

King County DNRP assumes a standard increase of 3 percent per year in projecting costs for its wastewater capital projects to account for price increases in project components such as materials, labor, equipment, supplies, and contractor markups. This rate is used because it reflects the historical rate of inflation over long periods of time. For example, during the 20-year period from 1987 to 2007, inflation as measured by the CCI averaged 3.01 percent per year. If the Consumer Price Index (CPI) was used to measure price changes during this same 20-year period, the annual average is 3.04 percent.

Extraordinary Inflation

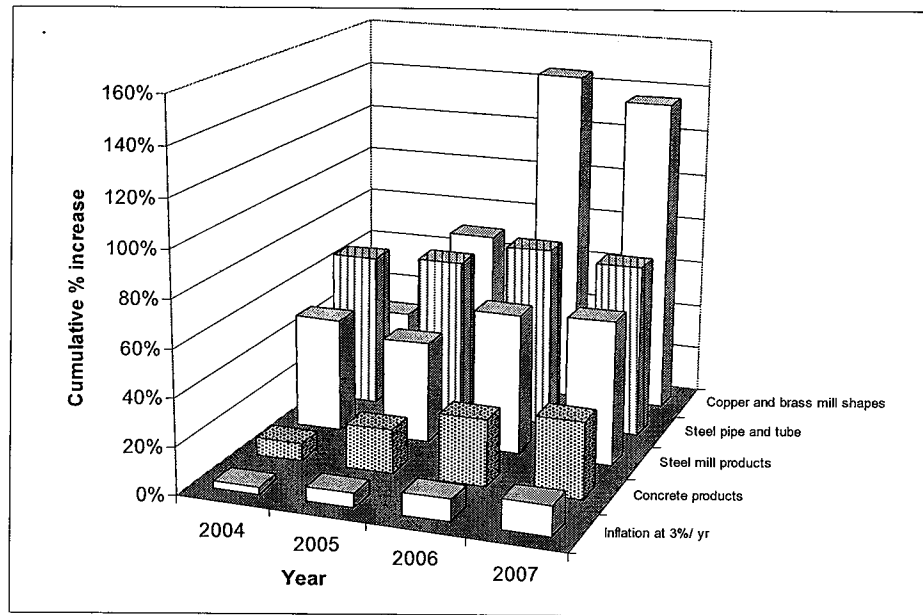
During relatively short periods of time, actual inflation can outpace general inflation, sometimes by a wide margin. This was the case in 2004 and 2005 when the construction industry experienced double-digit price increases for many commodities due to a combination of factors, such as high construction demand in global markets, hurricane damage in the U.S., and the conflict in Iraq. Prices in construction have since moderated, but the effects of such volatility can last well beyond the actual inflationary episode and serve to increase the price of contractor bids. For example, if a contractor underestimated

³ King County Department of Natural Resources and Parks. Brightwater Facilities; Current Conditions and Trends Potentially Affecting the Cost of the Brightwater Facilities. December 2005.

inflation on a past bid, he may be reluctant to assume that future price increases will moderate, even if actual price changes are currently in line with expected inflation. This could lead to higher bid prices on future jobs.

Figure 3 illustrates the cumulative increase since 2004 in the prices of select commodities compared to inflation at 3 percent per year. The commodities presented are those used in constructing Brightwater, including steel, copper, and concrete.

Figure 3
Cumulative Price Changes for Selected Commodities related to Brightwater Construction (2004–2007)



Source: Bureau of Labor Statistics Producer Price Index

Figure 3 shows that in 2007, price increases moderated over prior year increases for all of the selected commodities, i.e., the *rate of increase* in prices in 2007 was significantly below that experienced in 2006, though prices actually decreased for only two commodities compared to 2006 (copper/brass mill shapes and steel pipe and tube), though they were still well above 2005 levels. For 2008, the slowing national economy with attendant reductions in home construction and slowing in non-residential construction predicted for most sectors can be expected to promote a continuation of low to moderate price increases through 2008.

Brightwater Contracting Methods

King County DNRP is employing three contracting methods to construct the Brightwater system. The treatment plant is being constructed using a combination of the design-bid-build (DBB) and general contractor/construction manager (GC/CM) methods. The conveyance facilities are being constructed using the traditional design-bid-build method, and the Marine Outfall is being constructed using the design-build method. The *January 2007 Update* explained each method and its affect on how costs were estimated⁴; the following discussion reviews these contracting methods and their status for each major component of the Brightwater system.

Treatment Plant

King County DNRP assumed that the Brightwater Treatment Plant would be built entirely using the GC/CM contracting method well into the design process. However, at about 90 percent design, Hoffman Construction, the treatment plant's GC/CM, notified DNRP that it had insufficient bonding capacity to secure a performance and payment bond to cover the entire \$450 million estimated cost of the treatment plant. DNRP addressed this unforeseen circumstance by reducing Hoffman's scope of work by removing the solids, odor control systems, and energy facilities from the GC/CM contract and bid that work separately under a design-bid-build contract (Solids Contract). Hoffman Construction would continue to manage construction of the earthwork, site preparation, North Mitigation Area, Environmental Education/Community Center, and liquids stream facilities (Liquids Contract).

A key difference between the GC/CM method and the DBB method is how project costs are estimated. Once design is complete, the GC/CM prepares a final cost estimate that is used as the basis for negotiation with the owner. The owner and GC/CM then negotiate a guaranteed construction cost (GCC), which is the maximum cost that the owner will pay for the project. After the GCC is negotiated, the GC/CM will then bid out the project work (buyout process), award the contracts to subcontractors, and manage the construction work. Because the GC/CM agrees to complete a project for a fixed price *before* bids are received, he must take into account market factors and escalation during the term of the construction contract, i.e., the guaranteed construction cost reflects the contractor's risks. As a result, the GC/CM cost estimate is generally much more conservative (higher) than an estimate for the same work using the design-bid-build method—often 10 to 15 percent higher. Some or all of this additional cost can be returned to the owner if the contractor's risks do not materialize and bids come in lower than expected. The current estimate reflects \$28 million cost reduction for buyout savings to date; however, the final savings won't be known until the remaining subcontracts are awarded later in 2008. As of January 2008, DNRP has negotiated a guaranteed construction cost with Hoffman Construction for the liquids stream facilities and awarded a contract to Kiewit-Pacific for the solids/odor control facilities.

⁴ King County Department of Natural Resources and Parks. Brightwater Cost Update: Current Conditions and Trends. January 2007. pgs. 18–20.

Conveyance Facilities

The Brightwater conveyance tunnels and associated facilities are being developed using the traditional design-bid-build contracting method typically used by King County. Under this approach, a project's construction costs are estimated by the design engineer; however, bid timing and risk may significantly affect the actual cost of the work. Bid timing may affect costs because engineer's estimates typically include budget-level costs, i.e., costs not driven by competition between suppliers. As a result, the engineer's estimates may not accurately reflect the amount of competition in the marketplace when the job is bid or the potential effect of escalation on materials prices when the job is constructed. Risk may affect costs because the owner carries the risk for a higher-than-anticipated bid cost, differing site conditions, and change orders or claims. As of January 2008, DNRP has awarded contracts for all the conveyance tunnels facilities. With the exception of the Influent Pump Station, all the bid costs have been below the engineer's estimates.

Marine Outfall

The Brightwater Marine Outfall is being developed using the design-build contracting method. This method integrates the designers and contractors under one contract early in the project lifecycle, resulting in creative solutions to the project design and a single point of responsibility for the owner. Cost estimating under the design-build approach is similar to the GC/CM method in that the design-build teams agree to construct the project for a guaranteed cost. A key difference is that the design-build estimate is based on about 30 percent design, whereas the GC/CM estimate is based on 100 percent design. As such, the design-build team must make allowances for items that have not yet been fully designed. King County DNRP benefited from the high level of competition for the Marine Outfall, ultimately selecting Triton Marine Construction Company as its design-build contractor in July 2007. As of January 2008, Triton had submitted the 60 percent design package for review.

Independent Cost Oversight

The Brightwater project has had independent, external oversight and monitoring of its design and construction since March 2005. Brightwater cost forecasts and schedules have been examined by R.W. Beck, the project's Oversight Monitoring Consultant (OMC), to provide professional opinions on the strength of the project's management by reviewing project management practices and evaluating the project costs and schedule, including a review of the baseline estimate and subsequent cost estimates.

Brightwater Cost Estimates

This section presents the details of the \$1.8 billion Brightwater cost estimate as of January 2008. The section begins with a discussion of how the format for presenting Brightwater cost estimates has changed over time to reflect the maturing of the project and to help track costs from year to year. The section then summarizes the Brightwater cost estimates for the treatment and conveyance system in Tables 7 and 8, respectively, and presents them in detail in Appendices B and C. One change from the *January 2007 Update* is that the costs for land and mitigation are now included as part of the treatment and conveyance costs instead of being listed separately. However, a summary of the mitigation costs is provided in Table 9. The specific factors that contributed to the cost changes between the January 2007 and January 2008 Updates are explained in the following section titled “Cost Changes since January 2007.”

Format for Presenting Costs

The format of cost estimates for the Brightwater project has necessarily changed over time. In the planning phase of the Brightwater project, cost estimates were presented in terms of present value, which provided a consistent means of comparing the various alternatives. Once the current project configuration was adopted, cost estimates were presented in constant dollars; that is, dollars adjusted for inflation (deflated) to reflect base-year prices. In the *December 2005 Update*, the future costs in constant 2005 dollars were spread over the remaining project lifetime by year and inflation was added at 3 percent per year to develop total lifetime costs in nominal (inflated) dollars. Because the project was transitioning from design to construction, the *January 2007 Update* presented nominal costs with a blend of inflation, including actual inflation through December 2006, contractor’s estimates of inflation included as part of their conveyance bid packages, and estimates of both general and extraordinary inflation on remaining construction and non-construction costs.

The change in formats for presenting the cost information between the 2004 baseline, the *December 2005 Update*, and the *January 2007 Update* made it difficult to compare those estimates. Consequently, the Oversight Monitoring Consultant recommended that DNRP “Restate the 2004 Baseline Budget into the cost categories that DNRP wishes to track and manage moving forward so that cost information can be tracked and understood more quickly.”⁵ As a result, both DNRP staff and the OMC agreed that costs should include inflated dollars versus constant (base year) dollars. DNRP proposed using the Brightwater Monthly Report format adopted by the Council in 2005 for presenting future cost estimates, and the OMC requested that the format be expanded to show greater detail on the construction contracts along with their associated sales tax and contingency use. The costs presented in this section reflect this revised format.

⁵Brightwater Oversight Design Phase Report. May 14, 2007. p. ES-5

Treatment Plant Costs

The treatment plant costs are presented in Table 7. The table shows the expected total cost of the treatment plant to be approximately \$875 million, which is an overall increase of about \$35.5 million in treatment plant costs over those presented in January 2007.

Table 7
Brightwater Treatment Plant Cost Estimates (millions)^a

	January 07 Inflated	January 08 Inflated	Change Jan. 07–Jan. 08	Percent Change
Construction Costs				
Site Preparation Contract	\$20,477,332	\$ 19,531,816	\$ (945,516)	-4.6%
Liquids Contract	239,207,118	223,109,986	9,546,016	4.0%
MBR Contract (added to Owner Furnished Equipment below)	(20,493,583)			
I&C Contract (added to Owner Furnished Equipment below)	(5,149,565)			
Solids Contract	154,941,532	166,459,000	11,517,468	7.4%
Miscellaneous (Demolition, etc.)		245,716	245,716	
Construction Contract Mitigation	23,713,575	25,812,013	2,098,438	8.8%
Owner Controlled Insurance	9,358,193	9,358,156	(37)	0.0%
Construction Contingency	38,315,059	33,125,723	(5,189,336)	-13.5%
Sales Tax	30,178,615	35,404,657	5,226,042	17.3%
Owner Furnished Equipment	32,859,973	28,545,397	(4,314,576)	-13.1%
Outside Agency Costs	4,562,699	6,794,735	2,232,036	48.9%
Other Capital Charges	2,743,042	2,544,234	(198,809)	-7.2%
<i>Subtotal Construction Costs</i>	530,713,991	550,931,432	20,217,441	3.8%
Non-Construction Costs				
Engineering Services	66,245,066	76,494,770	10,249,703	15.5%
Planning and Management Services	26,331,979	27,734,228	1,402,250	5.3%
Permitting and Other Agency Support	84,526,403	84,304,446	(221,957)	-0.3%
Right-of-Way	107,304,281	105,290,164	(2,014,118)	-1.9%
Misc. Services & Materials	4,473,837	4,747,171	273,334	6.1%
Staff Labor	26,847,076	27,046,915	199,839	0.7%
<i>Subtotal Non-Construction Costs</i>	315,728,643	325,617,694	9,889,051	3.1%
Project Contingency	4,000,000	2,000,000	(2,000,000)	-50.0%
Project Total	850,442,634	878,549,126	28,106,492	3.3%
Credits and Revenues	(10,606,932)	(3,235,415)	7,371,517	-69.5%
Project Total + Credits and Revenues	\$839,835,702	\$875,313,711	\$35,478,009	4.2%

^aTotals may not add due to rounding.

Conveyance System Costs

Table 8 shows the expected total cost of the conveyance system is about \$927 million, which is an overall decrease of \$0.5 million in conveyance costs since January 2007.

Table 8
Brightwater Conveyance Cost Estimates^a

	January 07 Inflated	January 08 Inflated	Change Jan. 07–Jan. 08	Percent Change
Construction Costs				
East Tunnel Contract	\$130,279,334	\$131,773,525	\$1,494,191	1.1%
Central Tunnel Contract	\$208,209,665	\$209,257,046	\$1,047,381	0.5%
West Tunnel Contract	\$102,321,612	\$103,516,972	\$1,195,359	1.2%
Influent Pump Station Contract	\$71,496,000	\$91,473,000	\$19,977,000	27.9%
Marine Outfall Contract	\$33,500,000	\$23,424,577	\$(4,400,199)	-13.1%
Add Outfall Engineering Services to Engineering Services below	\$(5,675,224)			
Ancillary Facilities	\$9,919,764		\$1,061,888	10.7%
North Creek Facilities		\$6,847,745		
Ballinger Wy/N.Kenmore Odor Control		\$2,340,000		
Hollywood Facility Improvements		\$774,042		
BW Influent Network Improvements		\$374,000		
Other/Actuals (Demolition etc.)		\$645,866		
Construction Contract Mitigation	6,097,974	3,306,018	\$(2,791,957)	-45.8%
Judgements/Claims	1,213	1,213	\$0	0.0%
Owner Controlled Insurance	17,204,946	17,085,198	\$(119,748)	-0.7%
Construction Contingency	72,725,759	68,560,379	\$(4,165,380)	-5.7%
Sales Tax	55,840,410	57,211,622	\$1,371,212	2.5%
Owner Furnished Equipment	87,999	695,672	\$607,674	690.6%
Outside Agency Costs	5,056,347	5,999,885	\$943,538	18.7%
Other Capital Charges	613,984	192,068	\$(421,916)	-68.7%
<i>Subtotal – Construction Costs</i>	<i>707,679,783</i>	<i>723,478,827</i>	<i>15,799,044</i>	<i>2.2%</i>
Non-Construction Costs				
Engineering Services	75,528,542	76,834,884	\$1,306,341	1.7%
Planning and Management Services	57,595,909	53,820,097	\$(3,775,813)	-6.6%
Permitting and Other Agency Support	13,304,695	10,852,160	\$(2,452,535)	-18.4%
Right-of-Way	18,933,999	19,036,305	\$102,306	0.5%
Misc. Services & Materials	5,261,277	5,467,729	\$206,453	3.9%
Staff Labor	30,961,693	31,232,108	\$270,415	0.9%
<i>Subtotal – Non-Construction Costs</i>	<i>201,586,115</i>	<i>197,243,282</i>	<i>(4,342,833)</i>	<i>-2.2%</i>
Project Contingency	18,200,831	6,200,829	\$(12,000,002)	-65.9%
Project Total	927,466,730	926,922,938	(543,792)	-0.1%
Credits and Revenues	(5,351)	(6,415)	\$(1,064)	19.9%
Project Total + Credits and Revenues	\$927,461,379	\$926,916,523	\$(544,856)	-0.1%

^aTotals may not add due to rounding.

Mitigation Costs

Table 9 shows the cost and status of the mitigation effort for the Brightwater project. Note that these mitigation costs are included in Tables 7 and 8 above but separated out here to show how mitigation dollars are being spent.

Table 9
Brightwater Mitigation Costs^a

Mitigation Element	January 07 Inflated	January 08 Inflated	Change Jan. 07-Jan. 08	Percent Change
Habitat				
Plant Site North Mitigation Area	\$9,516,222	\$8,639,212	\$(877,010)	-9%
Plant Site South Mitigation Area - Howell Creek	1,749,672	657,142	(1,092,530)	-62%
Watershed Education (Fieldhouse Pavilion)	500,000	538,000	38,000	8%
Snohomish County Agreement	10,800,000	10,800,000	0	0%
Subtotal	22,565,894	20,634,354	(1,931,540)	-9%
Public Access				
Richmond Beach Community Mitigation	750,000	750,000	0	0%
Plant Site Boardwalks, Overlooks and Signage	964,835	1,333,689	368,854	38%
Boardwalks and Educational Signage at N. Creek	163,700	166,032	2,332	1%
Education/Community Building (EECC)	8,121,593	10,126,829	2,005,236	25%
EECC Furniture/Management/Bid Alt.		1,007,208	1,007,208	
Subtotal	10,000,128	13,383,758	3,383,630	34%
Natural Stormwater Treatment				
Plant Site Enhanced Natural Stormwater Treatment	3,961,046	3,508,834	(452,212)	-11%
Enhanced Natural Stormwater Management	654,800	664,127	9,327	1%
Enhanced Natural Stormwater Management	98,220	99,619	1,399	1%
Natural Stormwater Treatment at N. Creek Portal	450,175	456,587	6,412	1%
Subtotal	5,164,241	4,729,167	(435,074)	-8%
Traffic/Pedestrian Mitigation and Safety				
Traffic Mitigation	1,775,000	1,775,000	0	0%
Plant Site Boulevard Entry	23,406	30,450	7,044	30%
City of Kenmore Agreement	500,000	500,000	0	0%
Snohomish County Agreement	25,850,000	25,850,000	0	0%
Entry Improvements	130,960	101,600	(29,360)	-22%
195th Street Intersection Improvements	500,000	500,000	0	0%
Barge/rail Transport of Spoils	4,442,616	2,209,769	(2,232,847)	-50%
Subtotal	33,221,982	30,966,819	(2,255,163)	-7%
Noise/Light/Glare				
Noise Mitigation	286,475	188,300	(98,175)	-34%
Noise Mitigation	245,550	150,000	(95,550)	-39%
Noise Monitoring/Remediation	171,885	132,825	(39,060)	-23%
Subtotal	703,910	471,125	(232,785)	-33%
Visual Screening				
Plant Site Enhanced Landscaping	10,180,866	12,010,843	1,829,977	18%
Plant Site Architectural Finishes	2,953,773	2,976,200	22,427	1%
Subtotal	13,134,639	14,987,043	1,852,404	14%
Community Mitigation				
Job Retention	2,000,000	2,000,000	0	0%
Community Mitigation; Infrastructure	3,000,000	3,000,000	0	0%
Staff Review	130,000	130,000	0	0%
Subtotal	5,130,000	5,130,000	0	0%

Table 9 Continued
Brightwater Mitigation Costs^a

Mitigation Element	January 07 Inflated	January 08 Inflated	Change Jan. 07–Jan. 08	Percent Change
Restoration and Monitoring at Outfall				
Derelict Fishing Gear Mitigation	\$225,000	\$ 50,000	\$ (175,000)	-78%
Intertidal Monitoring,	50,000	50,000	0	0%
Eelgrass Replacement	700,000	700,000	0	0%
Shoreline Revegetation	237,365	50,000	(187,365)	-79%
Tribal Fisheries Research and Enhancement	1,415,000	1,395,893	(19,107)	-1%
Subtotal	2,627,365	2,245,893	(381,472)	-15%
Groundwater				
Monitoring	175,000	175,000	0	0%
Cross Valley Agreement	4,700,000	4,700,000	0	0%
Groundwater Supply Protection	862,000	862,000	0	0%
Subtotal	5,737,000	5,737,000	0	0%
Active Recreation				
Little Bear Creek Trail Overpass	1,400,000	1,400,000	0	0%
Snohomish County Agreement	30,400,000	30,400,000	0	0%
Subtotal	31,800,000	31,800,000	0	0%
Land Costs				
Land Mitigation	12,153,438	12,153,438	0	0%
City of Kenmore Agreement	5,707,994	5,707,994	0	0%
City of Shoreline Agreement	706,774	706,774	0	0%
Subtotal	18,568,206	18,568,206	0	0%
Total Committed Mitigation	\$148,653,365	\$148,653,365	0	0%

^aTotals may not add due to rounding.

Cost Changes since January 2007

This section describes the conditions that led to changes to the Brightwater cost estimate since January 2007. The section details the cost changes for both the treatment plant and conveyance system according to construction and non-construction costs. As of January 2008, there was an overall increase of about \$34 million associated with the cost of the treatment plant and an overall decrease of about \$0.5 million associated with the cost of the conveyance system, resulting in a combined increase of \$33.6 million over the cost estimate presented in the *January 2007 Update*.

Treatment Plant

The current cost estimate shows an overall increase of \$34.1 million in treatment plant costs since January 2007. The two major factors responsible for the majority of the construction cost increases are higher-than-expected bids for the Solids Contract and an increase in the actual awarded subcontractor packages as part of the Liquids Contract. There was also an identified need for additional engineering services during construction. The primary cost changes for the treatment plant are listed in Table 10 and summarized below.

Table 10
Brightwater Treatment Plant Cost Changes since January 2007 (millions)^a

Treatment Plant Element	January 2007 Inflated	January 2008 Inflated	Change Jan. 07–Jan. 08
Construction Costs			
Liquids Contract	\$215.3	\$223.1	\$7.8
Solids Contract	154.9	166.5	11.5
Construction Contingency	38.3	33.1	(5.2)
Sales Taxes	30.2	35.4	5.2
Owner Furnished Equipment	31.2	28.5	(2.6)
Outside Agency Costs	4.6	6.8	2.2
All Other Construction Costs	56.3	57.5	1.2
Non-Construction Costs			
Engineering Services	66.2	76.5	10.2
Project Contingency	4.0	2.0	(2.0)
Credits and Revenues	(10.6)	(3.2)	7.4
All other changes	249.5	249.1	(0.4)
Total	\$839.8	\$875.3	\$35.5

^aTotals may not add due to rounding.

Construction Costs

Table 10 shows that the primary drivers for increases in treatment plant construction costs were increases in the costs of the solids and liquids contracts and associated increases in sales tax. In terms of the Liquids Contract, there was an increase of about \$9.5 million in construction costs as the result of final contract negotiations with Hoffman Construction

and bidding of subcontract packages. King County opened bids for the Solids Contract on October 25, 2007. The successful low bidder was Kiewit Pacific, which came in about \$11.5 million higher than was estimated in the *January 2007 Update*; however, DNRP was fortunate that the bids were not higher still given the challenging bidding climate and the limited number of bidders. The increase in construction cost on both contracts was due to a combination of construction cost inflation and very challenging market conditions in the local construction market. Increases in the bid costs also resulted in higher sales taxes, which represented \$5.2 million of the increase.

Owner furnished equipment and materials shows a net decrease of \$4.3 million. The *January 2007 Update* assumed certain allowances for King County procurement of software, hardware, and a systems integrator. During 2007, a contract was executed with Emerson Ovation to standardize the Brightwater control system to the newly adopted standard for WTD's regional control system. This selection also resulted in a sole system integrator for the liquids, solids, and IPS contracts. Consequently, DNRP removed systems integration from the liquids contract by change order and contracted directly with Emerson. The subsequent negotiations with Emerson resulted in a reduction in the amount of equipment that DNRP had to purchase. Finally, there was \$2.2 million increase in outside agency costs for the work being done by the Snohomish County Public Utility District to construct a substation and relocate transmission lines on the Brightwater site. These costs increased primarily due to inflation affecting the cost of electrical components. The increases were offset somewhat by reducing construction contingency \$5.2 million.

Non-Construction Costs

The primary change in non-construction costs was the \$10.2 million increase for engineering support during construction. The *January 2007 Update* projected \$7.0 million for consultant engineering support to review and respond to contractor Requests for Information (RFIs) and submittals, which are critical to address quickly to avoid schedule delays or contractor claims. Based on revised scoping and work planning in 2007, the projected cost has increased by \$8.8 million to complete the project. This increase was based on both actual experiences for the first year of construction and a more accurate projection of future needs through the end of the project. The final costs for completion of this work are highly dependent upon actual project requirements and needs and may change further over time. The need for and use of these services will be monitored closely as construction progresses and adjusted accordingly.

Another area of change deals with costs, credits and revenues for the purchase and relocation of the Stockpot Soup Company from the treatment plant property. In 2005 King County entered into an agreement with Stockpot to acquire its existing production facility at Brightwater and relocate it to a new facility within the region. This facility has now been constructed and the terms of the agreement fulfilled. The *January 2007 Update* estimated that King County would receive \$10.61 million in revenue from property rental and sale of existing production equipment per the terms of the agreement. This number is now projected to be as low as \$4 million since King County has decided to retain some of the equipment and the economic conditions for the sale of the remaining equipment has changed. Once the sale of the remaining equipment is completed more information will be provided.

Conveyance System

There was an overall decrease in conveyance costs of about \$0.5 million since January 2007. Conveyance costs were primarily impacted by the higher-than-expected bids for the Influent Pump Station, an increase in costs related to the tunnel and ancillary facilities contracts, and an increase in sales tax associated with these higher construction costs. These increases were largely offset through the use of contingency and favorable bids on the Marine Outfall. Table 11 shows the components that make up the cost changes for the conveyance system organized by construction costs and non-construction costs.

Table 11
Brightwater Conveyance Cost Changes since January 2007 (millions)^a

Conveyance Element	January 2007 Inflated	January 2008 Inflated	Change Jan. 07–Jan. 08
Construction Costs			
East, Central, West, Ancillary Contracts	\$450.7	\$455.5	\$4.8
Influent Pump Station (IPS) Contract	71.5	91.5	20.0
Marine Outfall Contract	27.8	23.4	(4.4)
Construction Contingency	72.7	68.6	(4.2)
Sales Taxes	55.8	57.2	1.4
All Other Construction Costs	29.1	27.3	(1.8)
Non-Construction Costs			
Engineering/Planning & Mgmt. Services	133.1	130.7	(2.5)
Project Contingency	18.2	6.2	(12.0)
All Other Non-Construction	68.5	66.6	(1.9)
Total	\$927.5	\$926.9	(\$0.5)

^aTotals may not add due to rounding.

Construction Costs

Bids for the Influent Pump Station were received on March 9, 2007. The low bid from Kiewit Pacific is about \$20 million higher than the January 2007 cost estimate. The high bid costs were likely a reflection of the local bid climate for mechanical and electrical projects as well as the impacts of recent peaks in construction commodity inflation. The engineer's estimate assumed a 4 percent rate of inflation over two years (8 percent total) to escalate costs to the midpoint of construction. The contractor may have used a higher figure. Further, local shortages of skilled labor and increasing material costs may have also added to bid costs. Additionally, there is a competitive local market for private sector work that is generally favorable to contractors. The county's project representatives and construction managers evaluated the low bid considering these factors and recommended award to Kiewit Pacific.

In July 2007, DNRP received proposals and guaranteed construction costs from four design-build teams detailing their concept for building the Marine Outfall. After an extensive bid evaluation process, DNRP awarded the contract to Triton Marine Construction Company for \$29.1 million (including incentives and escalation allowance), which is about \$4.4 million below the estimate presented in January 2007. Bid costs for the Marine Outfall were more favorable in part because of the high level of competition for the project. The design-build work is well underway with the project nearing final design. Construction of the Marine

Outfall is scheduled for completion in November 2008, and the outfall will be the first major component of the Brightwater system to be completed.

Non-Construction Costs

There was an overall decrease in non-construction costs for the conveyance system primarily from a \$12 million reduction in the project contingency. DNPR feels that a reduction in project contingency is appropriate now that the construction costs for the major segments of the project are known. In addition, an evaluation of existing engineering and support service contract costs allowed a reduction in non-construction costs related to design services and geotechnical investigations. These cost reductions may be offset in the future as the needs for engineering support during construction for the three major tunneling contracts and IPS are refined over the coming year.

Mitigation

As mentioned, the mitigation program is currently on schedule and the total mitigation budget of \$148.6 million remains the same as that presented in the *January 2007 Update*. All original mitigation elements remain in the budget and no new mitigation items have been added, though savings in some areas have been redistributed to other areas of mitigation as needed at no net change to the budget. The mitigation elements within the program that have experienced cost change since 2007 were listed in Table 9 and are summarized as follows.

One significant cost change was associated with habitat improvements in the north and south mitigation areas at the treatment plant site. A savings of \$1.9 million was attributed to lower-than-expected construction costs and to a reallocation of \$0.4 million from the landscape planting costs for to the south mitigation area to the visual screening budget.

Public access costs increased by \$3.4 million due to an increase in boardwalk and educational signage that was needed to accept improved handrail design as well as to account for the 100 percent design cost estimate (the estimates were based on 90 percent design in the *January 2007 Update*). Also within the public access category, the Environmental Education and Community Center (EECC) costs have increased based on increasing the Leadership in Energy and Environmental Design (LEED) sustainable development goal from Silver to Gold and incorporating the 100 percent design cost estimate. Funds for furniture, fixtures, and equipment have been reserved and the bid alternate that would allow for the construction of a second laboratory has been funded with mitigation savings. A grant for \$675,000 was received for the EECC to fund the LEED design costs and detailed interior design; however, this work was not originally funded by the mitigation budget and does not affect the bottom line.

There was a savings of \$2.25 million related to traffic/pedestrian mitigation and safety that was attributed to the decreased cost of the barging of spoils from the Point Wells portal. Further, the actual construction costs of preventing noise, light, and glare at each of the conveyance portals was lower than expected. Visual screening costs have increased \$1.85 million due to increased cost to include steel edging to limit trail erosion, required maintenance on the north mitigation area until opening, and refinements reflected in the 100 percent design cost estimate of the treatment plant landscape design.

Uncertainties Potentially Affecting Cost

As of January 2008, construction contracts were in place for about 98 percent of the Brightwater construction work, and previous uncertainties associated with system design, property acquisition, permitting, and legal challenges have almost been eliminated. At this point in the project, uncertainty has shifted away from design changes, market conditions, and contractor bids to construction risk (change orders and claims) and the costs associated with construction support, including engineering services during construction and construction management. This section describes these uncertainties as well as DNRP's approach for mitigating these uncertainties.

Treatment Plant

As of January 2008, DNRP and Hoffman Construction have negotiated a maximum allowable construction costs (MACC) for about 97 percent of the treatment plant work, so these costs are certain. One remaining uncertainty relates to the estimated \$15 million to be awarded for the Environmental Education/Community Center Contract and Landscaping Contracts. DNRP expects to have the MACC for this work negotiated by the third quarter 2008 and will complete the buyout process by end of the year. At that time, the remaining treatment plant risks will be associated with the cost of potential changes during construction or the need for additional services during construction.

Changes during Construction

There are two important sources of potential changes during construction at the treatment plant. One is related to the ongoing nature of site preparation and earthwork, which will continue to occur over the life of the construction. Risks associated with earthwork include unforeseen conditions such as the discovery of contaminated soil or groundwater intrusion within the site and the resulting change orders or claims generated by contractors to mitigate those conditions. Fortunately, while the first two years of construction have involved a considerable amount of earthwork and excavation, no significant sources of contamination or unforeseen groundwater conditions have been encountered. However, excavation and earthwork will continue through 2010.

The other source of potential change is the complexity of the treatment plant construction, which requires the coordination of multiple trades such as mechanical, electrical, and plumbing, as well as the coordination between the two contractors on site, Hoffman Construction for the liquids stream facilities and Kiewit-Pacific for the solids/odor control. Both Hoffman and Kiewit-Pacific are responsible for managing and coordinating the work and disciplines within their contract. With regard to the interface between the contractors, the contract documents were developed to delineate the specific responsibilities of each contractor and the contractual and physical interfaces. This will be an ongoing area that county construction management staff will monitor to ensure that the contractors are proactive in scheduling work to avoid and minimize conflicts as the work progresses.

Both treatment plant contracts carry a substantial completion date of January 31, 2011. Substantial completion is the contract milestone where construction is substantially complete, clean water testing has been completed, and the facility is ready to accept sewage for treatment and discharge. If there are schedule delays on one or both of the treatment plant contracts, there could potentially be a delay in the startup of the treatment plant and potentially of the entire Brightwater system. Likewise, if there are construction delays which extend completion of other parts of the system, there would be delays to the start-up of the treatment plant itself. Staff are developing contingency plans to allow clean water to circulate within the treatment plant to ensure that hydraulic testing of internal processes can be performed independent of the Brightwater system should delays be experienced. Staff continues to monitor the schedule to assess likely system completion dates and interrelationship between the facilities during testing and start up.

Services during Construction

In addition to managing potential contract changes, DNRP is closely managing the level of treatment plant construction support, including engineering services during construction and construction management. DNRP staff is heavily augmented during construction by consultant staff to provide administrative support and oversight during construction. Current consultant support projections are based on the staffing required to provide engineering and inspection services and project control assistance through completion. Support requirements are driven largely by the requirements of specific construction activities, their complexity, and the duration for their completion. These in turn drive the number of requests for information generated by the construction contractors, quality of submittals, actual field conditions encountered, the number and complexity of change orders, and any potential construction claims needing resolution. Staff closely monitors the consultant support requirements to ensure that staffing levels are appropriate to support daily project requirements and insures a quality product upon completion.

Conveyance System

With the award of the Influent Pump Station and Marine Outfall contracts, the primary remaining areas of uncertainty associated with the conveyance system are centered on unforeseen ground conditions that impact portal shaft, tunnel, and outfall construction. A related uncertainty is the chance that one or more of the tunnel boring machines will break down, which could result in the delay of tunnel completion. Delays in construction are particularly important with respect to the East Tunnel portal. At this location, contractors working on the East and Central Tunnels and the IPS have contractually defined windows for occupying space at the portal site to complete construction activities. Failure of one contractor to complete work in a timely manner may result in a change order or claim from another contractor requiring use of the same site. Construction management staff are carefully reviewing construction progress at the East Tunnel portal and proactively identifying mitigating measures should conflicts arise.

Tunneling Construction Risks

Construction of portal shafts and tunnels are well underway at construction sites in Bothell, Kenmore, and at Point Wells. Three of the four tunnel boring machines (TBM) are operating at this time. The fourth TBM to be used at Point Wells is in the final stages of manufacturing and is expected to arrive on site in May 2008, at which time four TBMs will be operating simultaneously. Table 12 shows key milestones leading to the completion of the conveyance tunnels.

Table 12
Brightwater Tunneling Milestones

Date	Tunnel Segment	Activity
November 2008	East	Construction completed
March 2009	East	Influent Pump Station (IPS) mobilized
February 2009	Central	Kenmore Ballinger Way portal shaft construction completed
April 2009	Central	Kenmore east-bound tunnel construction completed
December 2009	Central	Kenmore west-bound tunnel construction completed
January 2010	East	Interior piping installation completed
April 2010	West	Point Wells construction completed

The most critical milestone identified in Table 12 is the completion of the East Tunnel in November 2008. Completion of this tunnel allows the Influent Pumping Station contractor access to the site to begin construction of the IPS. Completion of the IPS is in turn critical to the hydraulic completion of the Brightwater system in early 2011 and start up of sewage treatment in the spring. Each individual construction contract includes interim milestone dates and a specified time of performance for all work under the contract. These dates are based on the master construction schedule for work under all the conveyance contracts to support startup and testing of the treatment plant and Influent Pump Station in early 2011. More detailed information can be found in the monthly Brightwater construction reports.

Changes during Construction

King County DNRP recognizes that there are significant risks inherent in underground construction. In general, risks have been mitigated through implementation of an extensive geotechnical exploration program, development of performance and prescriptive specifications to address certain construction operations, and inclusion of risk management elements in the construction contracts, such as geotechnical baseline reports, differing site condition clauses, and use of a dispute review board. Nonetheless, it is important to recognize that during the course of the work, risk events may occur that will affect the time and cost of completion of the work under each contract.

DNRP's contract terms and conditions provide a process for making changes to the contract time, including the contractual milestone dates, in cases where the county is responsible for the change or where the impact is caused by certain events that are beyond the control of either the contractor or the county, such as unusually severe weather. The contract also specifies that liquidated damages will be assessed if the contractor's work extends beyond a contractual milestone date. Through the change order process, DNRP can compensate the

tunneling contractors for changes that the county is responsible for, such as additional work directed by the county, differing site conditions, clarifications, or corrections to the design that result in additional costs. The contingency budget for each contract covers these costs.

Because of the linear nature of tunnel construction, if DNRP is required to give an extension of time in one contract, there may be an impact to work in a follow-on contract. DNRP maintains and updates its master schedule in order to identify such impacts well in advance so that strategies can be identified that would minimize the impact to the overall project, to the extent feasible. Depending on what caused the impact, a change in schedule in one contract that results in a delay to work under a follow-on contract could leave DNRP or the contractor responsible for compensating the affected contractor for standby time and other costs resulting from the delay.

Services during Construction

As with the treatment plant, DNRP is closely managing the level of construction support services for the conveyance system, including engineering services during construction and construction management. Staff will continually evaluate consultant support requirements to ensure that staffing levels are appropriate.

Other Uncertainties

There are two other cost uncertainties on the Brightwater project, both of which are in mediation and are expected to be resolved in 2008. The first is the cost of property acquisition of the Point Wells land area required for conveyance construction, the Point Wells Portal, and the connection point of the marine outfall. The negotiation to determine purchase price for this small parcel, in the larger land holding owned by Paramount Studios is on-going. The second involves the costs of additional mitigation required to offset potential impact to the aquifer utilized by the Lake Forest Park Water District. A settlement is currently being negotiated and the estimated cost to resolve the dispute is not known at this time. Following resolution of these two issues and with the award of the EECC construction and treatment plant landscape installation contracts later this year, all construction costs will be under contract and costs defined.

Contingency

Contingency is the amount set aside to handle unknown items, conditions, or events that experience shows will likely occur in the design and construction of a capital project. King County DNRP maintains two types of owner contingency: construction contingency and project contingency. Project contingency, also known as design contingency, is intended to cover design-related issues such as an unforeseen permit requirement. In the early stages of the project, uncertainties are greater and consequently the project contingency is higher. As the project moves through design and ultimately into construction, these uncertainties decrease, and consequently the project contingency will also decrease.

Construction contingency is intended to cover unforeseen circumstances that arise during construction such as differing site conditions or other issues that were not identified in the base contract. To address such a condition, either the owner or the contractor can request a change order. In the case of Brightwater, this change order is then evaluated by DNRP's construction management (CM) staff and by the external CM consultants employed by the county, including Jacobs Engineering Group, Camp, Dresser, & McKee, and Vanir Consulting (Hoffman Construction is also required to evaluate change requests from their subcontractors on the Liquids Contract). The change order is then referred to WTD management for review and approval. If the change order is approved, the CM staff then negotiates a final amount for the change order. This thorough change evaluation process ensures that contingency funds are used appropriately.

The amount of contingency available to a project is outlined in WTD's construction forecasting guidelines, which identify a general contingency rate of 10 percent at the beginning of construction (a \$1 million contract would have \$100,000 in construction contingency, and a \$2 million project would have \$200,000 in project contingency). However, in the case of Brightwater, several different construction contingency rates were used based on an evaluation of the risk for each construction contract.

The January 2008 estimate comes at a point where much of the project-level uncertainty has been eliminated because nearly all of the construction contracts have been awarded and are under construction. Owing to this increased certainty, DNRP reduced project contingency \$14 million to offset the higher-than-expected bid costs for contracts awarded since January 2007, as shown in Table 13. The remaining \$8.2 million in project contingency can be used to cover changes in future non-construction costs which consist primarily of construction management, engineering services during construction, legal costs, other staffing costs, and additional construction contingency, if needed.

Table 13
Brightwater Project and Construction Contingency (millions)^a

	January 2007	January 2008	Change Jan. 07–Jan. 08
Project Contingency			
Treatment	\$4.0	\$ 2.0	\$ (2.0)
Conveyance	18.2	6.2	(12.0)
<i>Subtotal</i>	22.2	8.2	(14.0)
Construction Contingency			
Treatment			
Gross Contingency	39.0	35.6	(3.5)
Less: Change Orders	(0.7)	(2.5)	(1.7)
Remaining Contingency	38.3	33.1	(5.2)
Conveyance			
Gross Contingency	72.8	73.8	1.1
Less: Change Orders	(0.04)	(5.3)	(5.2)
Remaining Contingency	72.7	68.6	(4.2)
<i>Subtotal</i>	111.0	101.7	(18.7)
Total	\$133.2	\$109.9	\$(32.7)

^aTotals may not add due to rounding.

Table 13 also shows that the treatment plant construction contingency was reduced about \$3.5 million based on the value of the final awarded Solids Contract and the Liquids Contract Guaranteed Construction Cost adjusted for buyout savings. The contingency rate was reduced on both the solids and liquids contracts based on an evaluation of the remaining risk for each contract. The remaining contingency reflects the amounts available net of change orders. Conveyance construction contingency was adjusted to \$68.6 million based on of the final awarded values for the Influent Pump Station and Marine Outfall contracts. The remaining contingency amount reflects the value after change orders.

Appendices

Appendix A – Cost Estimates vs. Baseline

Brightwater Cost Estimates Compared to Brightwater Baseline Budget (millions)^{ab}

	2004 Life to Date	2005	2006	2007	2008	2009	2010	2011	2012	Lifetime Total
Baseline Budget										
Oct. 2004 Predesign Estimate	\$154.9	\$133.8	\$88.3	\$160.6	\$312.9	\$351.1	\$198.5	\$82.9	\$0.0	\$1,483.1
Oct. 2004 Predesign Estimate @ 3 percent	154.9	137.8	93.6	175.5	352.1	407.0	237.1	102.0	0.0	1,660.2
Oct. 2004 Predesign Estimate @ 5 percent	154.9	140.5	97.3	186.0	380.3	448.1	266.1	116.7	0.0	1,789.9
Cost Estimate										
Dec. 2005 Estimate @ 3 percent	161.8	87.1	151.6	249.1	318.6	407.3	270.4	107.1	0.0	1,753.1
Jan. 2007 Estimate @ 3 percent	161.8	100.2	169.1	224.3	346.9	468.8	151.4	144.7	0.0	1,767.3
Jan. 2008 Estimate Inflated	\$161.8	\$100.2	\$169.1	\$213.6	\$365.5	\$403.6	\$268.6	\$95.0	\$24.6	\$1,802.2

^aTotals may not add due to rounding.^bShaded costs are actuals

Appendix B – Detailed Treatment Plant Costs^a

Treatment Plant Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation) ^a	Change Prior to Current	
					Dollars	Percent
CONSTRUCTION COSTS						
Implementation/Construction Contracts						
Site Preparation	5,800,001	6,140,960	6,373,943	20,477,332	-945,516	-4.6%
Liquids	164,300,012	187,804,230	204,940,902	239,207,118	7,837,110	3.6%
MBR Contract (added to Owner Furnished Equipment below)				(20,493,583)		
I&C Contract (added to Owner Furnished Equipment below)				(3,440,660)		
Solids	89,400,000	102,527,522	112,106,268	154,941,532	11,517,468	7.4%
Misc. (Demolition, etc.)				245,716	245,716	na
Construction Contracts Total	259,500,013	296,472,712	323,421,112	390,691,740	18,654,778	4.8%
Includes Mitigation Contingency from below						
Construction Mitigation (Baseline incl. contingency)						
North Mitigation Area (NMA)				6,737,616	-238,696	-3.5%
South Mitigation (Buffer Plantings/Arch Finishes etc)				11,518,066	1,517,526	13.2%
Environmental Ed. and Community Center (EECC)				5,457,893	819,608	15.0%
Construction Mitigation Contract Total	28,388,610	31,071,321	32,957,559	23,713,575	2,098,438	8.8%
Judgments/Claims					0	
OCIP - Owner Controlled Insurance Program - Baseline value and December 2005 OCIP costs included in contracts above				9,358,193	-37	0.0%
Contingency						
Site Preparation	684,533	807,446	901,171	532,070	-532,070	-100.0%
Liquids	16,430,000	19,911,819	22,566,842	19,352,438	-552,450	-2.9%
Solids	8,939,999	10,834,549	12,279,218	16,585,678	-4,101,253	-24.7%
Mitigation -						
Construction Mitigation (Baseline including contingency)						
North Mitigation Area (NMA)				178,260	-178,260	-100.0%
South Mitigation (Buffer Plantings/Arch Finishes etc)				1,205,494	635,815	52.7%
Environmental Education and Community Center EECC				461,118	-461,118	-100.0%
Contingency Total	26,054,532	31,553,814	35,747,231	38,315,059	-5,189,336	-13.5%
Sales Tax						
Site Preparation	356,129	383,450	402,843	1,596,715	Inc. Liquids	
Liquids	12,651,341	14,552,942	15,948,280	18,827,607	251,475	1.3%
Solids	6,934,086	7,994,120	8,772,124	7,862,557	2,684,451	34.1%
Procurement & Utility Relocation		0		2,673,177	2,673,177	na
Mitigation -						
Construction Mitigation (Baseline incl. contingency)						
North Mitigation Area (NMA)	1,823,530	1,999,790	2,123,899	525,584	-525,584	-100.0%
South Mitigation (Buffer Plantings/Arch Finishes etc)				939,275	569,401	60.6%
Environmental Education and Community Center EECC				426,879	-426,879	-100.0%
Sales Tax Total	21,765,086	24,930,302	27,247,146	30,178,615	5,226,042	17.3%
Subtotal KC Construction Contracts	335,708,240	384,028,149	419,373,049	492,257,182	20,789,885	4.2%

Treatment Plant Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation) ^a	Change Prior to Current	
					Dollars	Percent
Owner Furnished Equipment and Materials						
Equipment Contracts						
MBR Contract (Zenon)				20,493,583	20,493,583	0 0.0%
I&C Contract (Emerson)				3,440,660	5,149,565	1,708,905 49.7%
Other KC Equipment				5,506,575	1,652,249	-3,854,326 -70.0%
Mitigation	39,575	39,575	39,575	1,710,250	1,250,000	-460,250 -26.9%
Subtotal Owner Furnished Equipment	39,575	39,575	39,575	31,151,068	28,545,337	-2,605,671 -8.4%
Outside Agency Implementation/Construction						
Utility Relocations, etc.	0	0	0	4,562,699	6,794,735	2,232,036 48.9%
Subtotal Outside Agency Costs	0	0	0	4,562,699	6,794,735	2,232,036 48.9%
Other Capital Charges						
King County Direct Implementation						
Misc. Capital Costs	49,827	49,827	49,827	291,882	291,882	0 0.0%
Subtotal Other Capital Charges	49,827	49,827	49,827	2,451,160	2,252,352	-198,808 -8.1%
TOTAL CONSTRUCTION COST	335,797,642	384,117,551	419,462,451	530,713,991	550,931,432	20,217,441 3.8%
NON-CONSTRUCTION						
Engineering Services						
Engineering Services	50,911,433	53,019,281	54,523,113	59,230,558	60,612,981	1,382,423 2.3%
Non-Technical Engineering Services				0	0	0 0.0%
QA/QC Services				14,508	14,508	0 0.0%
Mitigation Engineering Services				0	0	0 0.0%
Engineering Services During Implementation						
Subtotal Engineering Services	50,911,433	53,019,281	54,523,113	70,000,000	15,867,280	8,867,280 126.7%
Planning and Management Services						
Planning or Study Services				66,245,066	76,494,770	10,249,703 15.5%
Program/Project Management Services						
Construction Management Services	12,062,100	12,561,498	12,917,791	1,932,458	1,932,056	-402 0.0%
Other Consulting Services	1,424,428	1,483,403	1,525,478	78,966	78,966	0 0.0%
Other Technical Services	4,434,734	4,618,342	4,749,336	13,000,000	12,999,834	-167 0.0%
Outside Legal Services	3,190,887	3,322,996	3,417,249	2,804,937	3,610,898	805,961 28.7%
Testing Services	1,397,430	1,455,287	1,496,564	3,418,044	3,475,052	57,008 1.7%
Subtotal Planning and Management Services	22,509,579	23,441,526	24,106,418	4,048,593	4,050,533	1,940 0.0%
Permitting and Other Agency Support						
Permits and Licenses	3,000,000	3,087,863	3,146,439	1,048,980	1,586,890	537,910 51.3%
Local Agency Project Costs	2,320,000	2,421,653	2,491,074	26,331,979	27,734,228	1,402,250 5.3%
Mitigation Payments - (Baseline included in Local Agency Project Costs)	13,750,000	14,352,468	14,763,909	883,649	1,102,228	218,579 24.7%
1% for Art Payment	4,300,000	4,806,787	5,171,801	2,897,803	4,529,892	1,632,089 56.3%
Subtotal Permitting and Other Agency Support	23,370,000	24,668,771	25,573,223	76,445,000	74,372,326	-2,072,674 -2.7%
Right-of-Way (not incl. in allied cost calcs.)						
Land Purchases/Easements	93,371,090	94,981,488	96,062,273	4,299,951	4,300,000	49 0.0%
Land Purchases/Easements-Mitigation	8,066,667	8,308,667	8,470,000	84,526,403	84,304,446	-221,957 -0.3%
Subtotal Right-of-Way	101,437,757	103,290,154	104,532,273	95,150,843	93,136,725	-2,014,118 -2.1%
				12,153,438	12,153,438	0 0.0%
				107,304,281	105,290,164	-2,014,118 -1.9%

Brightwater Cost Update

Treatment Plant Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation)		Change Prior to Current	
				January 07	January 08	Dollars	Percent
Misc. Services & Materials							
Office and Transportation Costs	1,000,000	1,075,346	1,130,801	807,057	1,055,404	248,346	30.8%
Equipment	62,373	68,747	73,438	57,129	81,131	24,002	42.0%
Supplies and Safety	198,002	217,123	231,197	329,671	333,960	4,289	1.3%
Professional Development/Travel	171,013	183,761	193,143	183,750	186,745	2,995	1.6%
Printing, Courier and Media Services	1,000,000	1,041,680	1,071,748	946,369	974,310	27,942	3.0%
Miscellaneous Services	1,987,108	2,057,220	2,108,824	1,567,963	1,535,621	-32,343	-2.1%
Other	57,149	63,523	68,214	581,898	580,000	-1,898	-0.3%
Subtotal Misc. Services & Materials	4,475,645	4,707,399	4,877,365	4,473,837	4,747,171	273,334	6.1%
TOTAL NON-CONSTRUCTION COST	24,004,310	25,925,859	27,329,391	26,847,076	27,046,915	199,839	0.7%
Mitigation Allied Costs (included above)	226,708,723	235,052,990	240,941,783	315,728,643	325,617,694	9,889,051	3.1%
Accrual Adjustment	9,100,000			8,180,699	8,180,699	0	0.0%
Project Contingency (Reserve)	25,880,400	31,226,405	35,287,985	4,000,000	2,000,000	-2,000,000	-50.0%
TREATMENT PLANT TOTAL	588,386,765	650,396,946	695,692,219	850,442,634	878,549,126	28,106,492	3.3%
Credits and Revenues	-10,000,000	-10,786,544	-11,335,009	-10,606,932	(3,235,415)	7,371,517	-69.5%
Treatment Plant Total + Credits and Revenues	578,386,765	639,610,402	684,357,210	839,835,702	875,313,711	35,478,009	4.2%

Treatment Plant Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation)	Change Prior to Current	
					Dollars	Percent
Staff Labor						
Non-WTD Support						
Central Services	590,879	599,239	604,813	1,649,246	1,982,559	333,313 20.2%
Legal Services	487,196	521,194	545,918	1,109,459	1,134,554	25,196 2.3%
Surface Water Management	103,743	103,743	103,743	278,619	300,000	21,381 7.7%
WLRD	557,425	619,899	665,313	519,899	569,899	50,000 9.6%
DNRP	174,778	185,819	193,811	185,819	174,648	-11,171 -6.0%
Other	608,093	625,508	638,192	675,508	759,948	84,440 12.5%
Subtotal Non-WTD	2,522,114	2,655,402	2,751,790	4,418,549	4,921,708	503,159 11.4%
Wastewater Treatment Division - (Restated for Revised Cost Centers 1/1/08)						
4100 WTD Manager	83,021	88,542	92,538	88,542	88,541	0 0.0%
4200 Finance & Administrative Services	515,037	589,452	645,130	814,452	510,062	-304,390 -37.4%
4400 East Operations	244,133	249,814	253,664	264,814	361,330	96,516 36.4%
4500 West Operations	156,583	159,992	162,302	174,992	174,992	0 0.0%
4600 Resource Recovery Programs & Mgmt	160,705	171,746	179,738	171,746	133,727	-38,019 -22.1%
4700 Environmental & Community Svcs						
4751 Community Svcs Planning	2,867,904	3,102,142	3,274,545	1,910,638	1,902,191	-8,447 -0.4%
4752/4701 Environmental Planning & Mgmt	1,198,899	1,221,475	1,237,125	1,237,094	1,262,587	15,493 1.3%
4761/62 Permitting, Right of Way & Monitoring	1,379,210	1,474,480	1,544,491	1,428,973	1,626,790	197,817 13.8%
4770 Industrial Waste	1,733	1,733	1,733	1,733	1,733	0 0.0%
4800 Project Planning & Delivery						
4803 Project Planning & Delivery Mgmt	3,683,990	3,912,162	4,076,940	3,447,327	3,183,543	-263,784 -7.7%
4805 Technical Resources Mgmt	4,095	4,095	4,095	284,638	27,334	-257,305 -90.4%
4806 Modeling & GIS Support	167,315	178,356	186,349	178,356	116,381	-61,975 -34.7%
4808/09/16 Planning, Asset Mgmt & Mgmt	27,879	27,879	27,879	32,458	32,770	312 1.0%
4830 Construction	1,188,458	1,343,972	1,457,277	393,673	96,609	-297,065 -75.5%
4840 Facilities Inspection	1,685,954	1,921,466	2,095,236	238,068	167,446	-70,622 -29.7%
4850 Project Engineering	1,867,277	2,040,075	2,165,857	1,462,167	814,877	-647,280 -44.3%
4880 Project Management	4,822,089	5,226,688	5,522,176	4,537,053	3,695,986	-841,067 -18.5%
4990 Project Controls	1,427,913	1,556,388	1,650,525	2,271,630	2,321,446	49,816 2.2%
4900 Brightwater						
4921 Brightwater Mgmt				3,490,174	5,616,863	2,126,690
Subtotal WTD	21,482,196	23,270,457	24,577,601	22,428,527	22,125,207	-303,320 -1.4%
TOTAL SOFT CAPITAL COST	24,004,310	25,925,859	27,329,391	26,847,076	27,046,915	199,839 0.7%

^aTotals may not add due to rounding.

Appendix C – Detailed Conveyance System Costs^a

Conveyance Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation)		Change Prior to Current	
				January 07	January 08	Dollars	Percent
CONSTRUCTION COSTS							
Implementation/Construction Contracts							
East Tunnel							
Central Tunnel	125,000,001	138,917,766	148,861,974	130,279,334	131,773,525	1,494,191	1.1%
West Tunnel	211,950,009	240,392,409	260,984,805	208,209,665	209,257,046	1,047,381	0.5%
Influent Pump Station	94,500,003	107,636,090	117,193,461	102,321,612	103,516,972	1,195,359	1.2%
Marine Outfall	49,200,002	57,984,794	64,535,329	71,496,000	91,473,000	19,977,000	27.9%
Add Outfall Engineering Services to Engineering Services below	20,200,001	23,461,492	25,863,175	33,500,000	23,424,577	-4,400,199	-13.1%
Ancillary Facilities				(5,675,224)	na		
North Creek Facilities	7,145,612	8,321,951	9,193,488	9,919,764		1,061,888	10.7%
Ballinger Wy/N.Kenmore Odor Control					6,847,745		
Hollywood Facility Improvements					2,340,000		
Brightwater Influent Network Improvements					774,042		
Other/Actuals (Demolition etc.)					374,000		
Utility Relocation					645,866		
Construction Contracts Total	3,500,002	3,728,003	3,884,589				
Construction Mitigation (Baseline incl. contingency)	511,495,630	580,442,505	630,516,822	550,051,152	570,426,772	20,375,620	3.7%
Includes Mitigation Contingency from below							
East Tunnel				699,712	496,495	-203,217	-29.0%
Central Tunnel				666,393		-194,365	-29.2%
Central Portal 44					444,262		
Central Portal 5					27,766		
West Tunnel				4,731,870	2,337,494	-2,394,375	-50.6%
Construction Mitigation Contract Total	4,163,169	4,754,609	5,186,082	6,097,974	3,306,018	-2,791,957	-45.8%
Judgments/Claims				1,213	1,213	0	na
Owner Controlled Insurance Program (OCIP)	Baseline value and December 2005 OCIP costs included in contracts above			17,204,946	17,085,198	-119,748	na
Contingency							
East Tunnel	12,491,794	15,139,034	17,157,659	13,027,933	12,072,100	-955,833	-7.3%
Central Tunnel	21,181,086	25,669,747	29,092,527	31,231,450	30,407,588	-823,861	-2.6%
West Tunnel	9,443,796	11,445,110	12,971,190	12,790,202	9,112,972	-3,677,229	-28.8%
Influent Pump Station	4,916,770	5,958,724	6,753,255	10,724,400	13,720,950	2,996,550	27.9%
Marine Outfall	2,018,674	2,446,468	2,772,678	3,350,000	2,108,212	-1,241,788	-37.1%
Ancillary	714,092	865,421	980,816	991,976		75,828	7.6%
North Creek Facilities					684,775		
Ballinger Wy/N.Kenmore Odor Control					234,000		
Hollywood Facility Improvements					104,150		
Brightwater Influent Network Improvements					44,880		
Utility Relocation							
Mitigation -	349,770	423,893	480,415				
Contingency included above in Mitigation Construction above							
East Tunnel				69,971		-69,971	-100.0%
Central Tunnel				66,639	70,752	4,113	6.2%
West Tunnel				473,187		-473,187	-100.0%

Conveyance Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% Infl)	Baseline Cost (w/ 5% Infl)	Trend Costs (Including Inflation)		Change Prior to Current	
				January 07	January 08	Dollars	Percent
Contingency Total	51,115,982	61,948,399	70,208,539	72,725,759	68,560,379	-4,165,380	-5.7%
Sales Tax							
East Tunnel	12,237,500	13,684,161	14,725,089	12,611,040	12,499,829	-111,211	-0.9%
Central Tunnel	20,749,906	23,679,970	25,816,025	21,070,818	21,031,166	-39,652	-0.2%
West Tunnel	9,251,550	10,602,745	11,592,512	10,129,840	9,770,923	-358,916	-3.5%
Influent Pump Station	4,816,680	5,711,820	6,383,688	7,235,395	9,347,577	2,112,181	29.2%
Marine Outfall	1,977,580	2,311,086	2,558,327	3,242,800	2,558,957	-683,843	-21.1%
Ancillary	735,229	855,652	945,443	960,233		8,008	0.8%
North Creek Facilities					656,804		
Ballinger Wy/N.Kenmore Odor Control					229,086		
Hollywood Facility Improvements					45,070		
Brightwater Influent Network Improvements					37,280		
Other/Actuals (Demolition etc.)					747,179	747,179	
Utility Relocation	342,650	367,229	384,255				na
Mitigation -	287,637	328,500	358,311				
East Tunnel				68,502		-68,502	-100.0%
Central Tunnel				65,240	287,750	222,510	341.1%
West Tunnel				456,542		-456,542	-100.0%
Sales Tax Total	50,398,733	57,541,162	62,763,650	55,840,410	57,211,622	1,371,212	2.5%
Subtotal KC Construction Contracts	617,173,514	704,686,675	768,675,093	701,921,454	716,591,201	14,669,748	2.1%
Owner Furnished Equipment and Materials							
Procurement Contracts	66,419	66,419	66,419	87,999		607,674	690.6%
- I&C (Emerson)					607,674		
Other/Actuals (Demolition etc.)					87,999		
Subtotal Owner Furnished Equipment	66,419	66,419	66,419	87,999	695,672	607,674	690.6%
Outside Agency Implementation/Construction							
Shown above in Construction							
Utility Relocations, etc.							
Subtotal Outside Agency Costs	0	0	0	5,056,347	5,999,885	943,538	18.7%
Other Capital Charges							
WTD Direct Implementation				0	0	0	
King County Direct Implementation	3,601	3,601	3,601	172,424	192,068	19,644	11.4%
Misc. Capital Costs	0	0	0	441,560		-441,560	-100.0%
Subtotal Other Capital Charges	3,601	3,601	3,601	613,984	192,068	-421,916	-68.7%
TOTAL CONSTRUCTION COST	617,243,534	704,756,695	768,745,113	707,679,783	723,478,827	15,799,044	2.2%

Conveyance Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation)		Change Prior to Current	
				January 07	January 08	Dollars	Percent
Staff Labor (from sheet below)	28,553,706	30,441,681	31,807,435	30,961,693	31,232,108	270,415	0.9%
TOTAL NON-CONSTRUCTION COST	213,303,726	226,315,553	235,648,840	201,586,115	197,243,282	-4,342,833	-2.2%
Mitigation Allied Costs (included above)	1,300,000			456,754	456,754	0	0.0%
Accrual Adjustment						0	
Project Reserve	74,165,992	89,486,148	101,125,501	18,200,831	6,200,829	12,000,002	-65.9%
CONVEYANCE TOTAL	904,713,252	1,020,558,396	1,105,519,454	927,466,730	926,922,938	-543,792	-0.1%
Credits and Revenues				-5,351	-6,415	-1,064	19.9%
Conveyance Total + Credits and Revenues	904,713,252	1,020,558,396	1,105,519,454	927,461,379	926,916,523	-544,856	-0.1%

Brightwater Cost Update

Conveyance Item	Baseline Cost (2004\$)	Baseline Cost (w/ 3% infl)	Baseline Cost (w/ 5% infl)	Trend Costs (Including Inflation)		Change Prior to Current	
				January 07	January 08	Dollars	Percent
Staff Labor							
Non-WTD Support							
Central Services							
Legal Services	994,710	1,024,707	1,045,035	3,245,440	3,540,148	294,708	9.1%
Surface Water Management	554,793	588,791	613,515	1,044,202	1,481,496	437,294	41.9%
WLRD	240,896	246,417	250,413	212,753		-212,753	-100.0%
DNRD	2,325,112	2,358,235	2,382,212	2,644,557	2,744,557	100,000	3.8%
Other	439,851	450,892	458,884	488,672	528,672	40,000	8.2%
	635,468	652,883	665,567	224,031	500,985	276,954	123.6%
Subtotal Surface Water Engineering	5,190,830	5,321,924	5,415,626	7,859,654	8,795,857	936,203	11.9%
Wastewater Treatment Division							
4100 WTD Manager	67,055	72,576	76,572	72,428	72,428	0	0.0%
4200 Finance & Administrative Services	252,187	289,394	317,233	383,845	433,427	49,582	12.9%
4400 East Operations	57,467	62,987	66,983	63,443	63,443	0	0.0%
4500 West Operations	55,775	61,296	65,292	55,829	55,829	0	0.0%
4600 Planning & Compliance	30,805	33,565	35,563	39,296	39,296	0	0.0%
4700 Environmental & Community Svcs							
4751 Community Svcs Planning	2,354,918	2,589,156	2,761,559	1,452,625	1,379,370	-73,255	-5.0%
4752/4701 Environmental Planning & Mgmt	984,184	1,003,189	1,030,573	833,849	561,207	-272,642	-32.7%
4761/62 Permitting, Right of Way & Monitoring	2,024,718	2,147,512	2,234,770	1,873,035	1,528,235	-344,800	-18.4%
4770 Industrial Waste	0	0	0	0	0	0	
4800 Project Planning & Delivery							
4803 Project Planning & Delivery Mgmt	5,065,567	5,387,435	5,621,173	4,085,471	3,471,302	-614,169	-15.0%
4805 Technical Resources Mgmt	40,317	43,078	45,076	55,312	55,312	0	0.0%
4806 Modeling & GIS Support	401,588	412,089	419,389	393,727	393,728	0	0.0%
4808/09/16 Planning, Asset Mgmt & Mgmt	34,731	34,731	34,731	35,853	36,232	379	1.1%
4830 Construction	71,488	77,008	81,005	265,000	785,533	520,534	196.4%
4840 Facilities Inspection	172,864	183,905	191,898	172,363	95,971	-76,392	-44.3%
4850 Project Engineering	1,608,111	1,745,222	1,843,116	1,110,059	674,439	-435,620	-39.2%
4880 Project Management	7,164,455	7,693,655	8,074,902	5,938,887	5,130,929	-807,958	-13.6%
4990 Project Controls	2,996,645	3,282,958	3,491,975	2,600,000	2,386,109	-213,891	-8.2%
4900 Brightwater							
4921 Brightwater Mgmt				3,671,016	5,273,460	1,602,444	43.7%
Subtotal WTD	23,362,876	25,119,756	26,391,810	23,102,039	22,436,250	-665,789	-2.9%
TOTAL SOFT CAPITAL COST	28,553,706	30,441,681	31,807,435	30,961,693	31,232,108	270,415	0.9%

^aTotals may not add due to rounding.