



**King County**<sup>3e</sup>

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## MEMORANDUM

DATE: September 19, 2007

TO: King County Council Capital Budget Committee

FROM: Cheryle A. Broom, County Auditor

SUBJECT: Brightwater Project Quarterly Oversight Report

Attached is the second R.W. Beck's Brightwater Project Oversight Report (Beck report) issued under the mandated Capital Project Oversight Pilot Program established in the County Auditor's Office. The report responds to the County Council's goal of strengthening the Brightwater Project's performance and accountability through independent, expert oversight. The first Beck oversight report, presented to the Council on May 16<sup>th</sup>, analyzed the Wastewater Treatment Division's Brightwater Project 2007 Trend Report, and the project status at the conclusion of the design phase.

We are pleased to note that Beck's September 2007 Brightwater Project quarterly report is the first report to be presented to the Council in an expanded format. This format, which replaces the previous Brightwater Project PowerPoint presentations, provides more comprehensive information about the status of the Brightwater Project budget and schedule, and establishes a framework for easier monitoring of future project performance.

The Beck report concludes that the Wastewater Treatment Division (WTD) made significant progress in implementing the May 16<sup>th</sup> oversight report recommendations. The report also indicates that recent Brightwater Project cost trends are more consistent with the higher estimates that Beck developed in May based on its review of WTD's *2007 Trend Report* (see Table ES-1 Estimated Project Costs on first page of attached report). In addition, Beck concludes that the Brightwater Project is currently on schedule, although an integrated project schedule will not be available until later this year when the bids for influent pump station and solids portion of the treatment plant construction are final.

We appreciate the collaborative efforts of WTD, council staff, and R.W. Beck consultants in promoting effective oversight of the Brightwater Project consistent with council intent. Susan Baugh, Senior Principal Management Auditor, is coordinating this endeavor for the auditor's office.

CB:SB:yr

Attachment: R.W. Beck Oversight Consultant Quarterly Report, September 2007

cc: Ron Sims, County Executive  
Metropolitan King County Councilmembers  
Pam Bissonnette, Director, Department of Natural Resources and Parks (DNRP)  
Christie True, Division Director, Wastewater Treatment Division, DNRP  
Bob Cowan, Budget Director, Office of Management & Budget (OMB)  
Dave Lawson, Internal Audit Supervisor, Executive Audit Services, OMB  
David Jochim, Vice President, R.W. Beck, Inc.  
Pat Tangora, Senior Director, R.W. Beck, Inc.  
Nancy Glaser, King County Council Interim Policy Staff Director  
Mark Melroy, Senior Principal Legislative Analyst, King County Council  
Capital Budget Committee  
Beth Mounstier, Senior Principal Legislative Analyst, King County Council  
Regional Water Quality Committee

Brightwater Project Oversight  
Services, Contract No. P43024

Phase 2, Construction Phase  
Oversight Quarterly Report

King County

September 2007



in association with



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PTM Consulting LLC

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# Brightwater Project Oversight Monitoring Consultant Quarterly Report

September 19, 2007

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This report has been prepared for the use of the client for the specific purposes identified in the report. The conclusions, observations and recommendations contained herein attributed to R. W. Beck, Inc. (R. W. Beck) constitute the opinions of R. W. Beck. To the extent that statements, information and opinions provided by the client or others have been used in the preparation of this report, R. W. Beck has relied upon the same to be accurate, and for which no assurances are intended and no representations or warranties are made. R. W. Beck makes no certification and gives no assurances except as explicitly set forth in this report.

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# Brightwater Project Oversight Monitoring Consultant Quarterly Report

September 19, 2007

This report is a quarterly briefing on the Brightwater Project provided by R. W. Beck, Inc., the project's Oversight Monitoring Consultant (OMC). The OMC's last report was the *Phase I, Design Phase Oversight Wrap-Up Report*, dated May 14, 2007.

## Executive Summary

- WTD has made significant progress implementing the recommendations made by the OMC in its May 2007 report to the CBC. These include an aggressive outreach program to the contractor community, development of contingency plans to address “what if” conditions associated with the solids package bids, and development of tools to better manage and track project schedule and costs.
- WTD recently received excellent bids on the Marine Outfall, with a low bid of \$27.6 million (excluding sales tax and potential incentives). This is approximately \$6 million below the WTD's 2007 Trend Report estimate. The Marine Outfall is the last major conveyance system project to be contracted. Conveyance System total project cost estimates continue to trend within the cost range that we provided in our May 2007 report.
- Treatment plant costs are trending higher than WTD's 2007 Trend Report. WTD completed negotiations with Hoffman on the liquids package earlier this summer. Although potential buyout savings may yet be realized, Treatment Plant costs are trending within the cost range that we provided in our May 2007 report.
- Preparation of a consolidated schedule is well under way and is awaiting input from the IPS and solids package activities. The Brightwater Project continues to be on schedule, although there are indications that the critical path may be trending away from the Conveyance System toward the Treatment Plant.

Table ES-1. Estimated Project Costs

	2004 Baseline		2005 Trend	2007 Trend	Estimate Based on OMC Review of 2007 Trend
	3% Infl.	5% Infl.			
Conveyance	\$1,021	\$1,106	\$ 960	\$ 928	\$ 946 - \$ 952
Treatment Plant	\$ 640	\$ 684	\$ 793	\$ 840	\$ 882 - \$ 911
<b>Total</b>	<b>\$1,660</b>	<b>\$1,790</b>	<b>\$1,753</b>	<b>\$1,767</b>	<b>\$1,827 - \$1,862</b>

Note: All costs are shown in millions of nominal dollars.

## Progress on OMC Recommendations from May 2007

The Wastewater Treatment Division (WTD) has made excellent progress implementing our May 2007 recommendations. At that time, we specifically recommended that WTD: 1) conduct aggressive outreach to the construction contracting community to foster interest in the Solids Package; 2) develop a contingency plan in advance of the Treatment Plant Solids Package bid opening so that a response can be quickly implemented if less-than-favorable bids are obtained; 3) have Hoffman Construction Company (Hoffman) review the scopes of work for the Liquids and Solids Packages for gaps and overlaps; 4) develop an integrated schedule; 5) restate the 2004 Baseline Budget into new cost categories for ease of tracking; and 6) “delegate down” change order authority to WTD construction managers and the Brightwater Program Manager. Some follow-up work on the integrated schedule and cost tracking remain for WTD to complete. In addition, WTD is pursuing a change to its signature authority policy.

## Status of Costs

Cost trend information, presented in our May 2007 report, is summarized in Table ES-1. Since our last report, more definitive cost information has been obtained on two elements: the Liquids Package for the Treatment Plant and the Marine Outfall (Conveyance).

### Conveyance

The cost of the selected proposal for the Marine Outfall was \$27.6 million (excluding sales tax and potential incentives). This is approximately \$6 million less than WTD’s estimate in the 2007 Trend Report. The Marine Outfall is the last major conveyance contract (there are two remaining ancillary items yet to be designed in the Conveyance system.)

### Treatment Plant

WTD reduced the scope of the Liquids Package for the Treatment Plant, and some of the work was reassigned to “owner furnished equipment.” If the reduced scope and reassigned items are taken into account, the price negotiated with Hoffman (\$245.4 million) was higher than anticipated by WTD in its 2007 Trend Report.

Bids on the Treatment Plant Solids Package are scheduled to be received in late October 2007. This will be the last remaining major treatment element of the Brightwater Project to be put under contract.

## Conclusion

Considering that the Marine Outfall cost proposal was lower than expected and the Liquids Package negotiated cost was higher, we continue to believe the final Brightwater Project cost will range from \$1.827 to \$1.862 billion

## Schedule

The Brightwater Project appears to be maintaining schedule at this time. The project schedule is driven by the critical interface of the Treatment Plant and Conveyance projects which need to be ready for startup of the clean water circulation test in December of 2010. Although the critical

path of the project was previously driven by the Conveyance system, the recent change in contracting for the Solids Package and its resultant delays are now pushing the Treatment Plant close to becoming the critical path element. Any further delays of the Treatment Plant will put that project element on the critical path.

We have received the Master Integrated Schedule from WTD and are communicating our recommendations for improvements to this schedule to WTD.

## Background

We last reported to the Capital Budget Committee (CBC) on May 14, 2007. Our report at that time focused on three items:

- A summary of observations and findings following completion of the Brightwater Project design phase.
- Observations, opinions, and recommendations based on a review of WTD's "*Brightwater Cost Update, Current Conditions and Trends, January 2007*" (2007 Trend Report).
- Recommended actions to better manage cost and schedule risks as WTD moves forward into the construction phase of the Brightwater Project.

Since May, work was completed on both the Site Preparation and North Mitigation Area projects; final contract completion and closeout for these projects has yet to be attained. Also, several construction packages have been awarded, which include negotiation of the Liquids Package MACC under the GC/CM contract, the Influent Pump Station, and the Marine Outfall. Only one significant project element, the Solids Package, remains to be awarded. The Solids Package is scheduled for bid opening on October 25, 2007. A summary of the project award costs is shown in Table 1.

**Table 1**  
**Status of Construction Contracts for the Brightwater Project**

Element	Status	Contract Award Amount <sup>(1)</sup>	Escalation Clauses <sup>(2)</sup>
<b>Conveyance</b>			
East Tunnel	Under contract NTP: Jan. 30, 2006	\$130.9M	Capped at \$1,000,000. Steel pipe, rebar, and some concrete.
Central Tunnel	Under contract NTP: Aug. 28, 2006	\$211.1M	Capped at \$300,000. Steel pipe, rebar, and some concrete.
West Tunnel	Under contract NTP: Feb. 20, 2007	\$102.0M	Capped at \$1,000,000. Steel pipe, rebar, and some concrete.
Influent Pump Station	Under contract NTP: July 26, 2007	\$92.1M	Capped at \$300,000 for certain materials. Also allows additional increases for certain equipment if documented.

Element	Status	Contract Award Amount <sup>(1)</sup>	Escalation Clauses <sup>(2)</sup>
Marine Outfall	Notice of award provided late August 2007	\$27.6M	In RFP, capped at \$500,000 for environmental and safety incentives; \$1,000,000 cap for certain materials.
Ancillary Facilities <sup>(3)</sup>	Mostly under contract	\$11.3 M	
<b>Treatment Plant</b>			
North Mitigation Area and EECC	Under contract NTP: March 1, 2006	\$7.7M <sup>(4)</sup>	No escalation clauses. <b>WORK COMPLETED</b>
Site Preparation	Under contract NTP: March 30, 2006	\$23.8M <sup>(4)</sup>	No escalation clauses. <b>WORK COMPLETED</b>
Earthwork	Under contract NTP: April 5, 2007	\$41.8M <sup>(4)</sup>	Capped at \$250,000. Only for diesel.
Liquids Package	Under contract NTP: April 6, 2007	\$245.4M <sup>(4)</sup>	Capped at \$3,000,000
Solids Package	Bid opening Oct. 25, 2007 NTP: January 2008	TBD	Under development.

Notes:

1. Contract Award Amount excludes subsequent change orders. Includes approximately \$6.1 million non-Brightwater reclaimed water projects (in the Central Tunnel, West Tunnel, IPS, and Ancillary Facilities contracts) and \$0.7 million in non-Brightwater asset management costs in the Ancillary Facilities contracts.
2. Generally based on the percentage change in certain cost indices published by Engineering News Record, less five percent, or other industry cost indices. Specific requirements lay among the various contracts.
3. North Creek Facilities and Hollywood Facilities. Does not include Kenmore Odor Control facilities, which are not under contract for construction.
4. Cost shown is the GCC. There is potential cost savings from subcontractor buyout savings and unused MACC Contingency

## Conveyance

- WTD recently completed its process for evaluating the design-build proposals for the Marine Outfall and has identified Trident Marine Construction (Trident) as the successful contractor from a slate of four teams. WTD's selection process included a weighted ranking of both qualifications and cost. WTD weighted Trident's submittal highest in terms of qualifications and their base cost of \$27.6 million was lowest of the four teams. Trident's \$27.6 million cost (not including sales tax) could increase by another \$1.5 million with incentives and material cost escalation provisions. However, even with incentives and sales tax, the cost is less than the \$33.5 million estimated by WTD in its 2007 Trend Report. Contract award is anticipated by mid-October.
- The West Tunnel and Central Tunnel projects are proceeding on schedule. On the West Tunnel, an issue has arisen related to an easement needed under a parcel of property owned by the City of Seattle. WTD has been attempting to resolve issues with the City in order to secure the easement, however King County will initiate condemnation proceedings in the near future to acquire the easement.
- The East Tunnel has experienced a delay of approximately two months resulting from delivery of critical ball bearings needed for assembly of the tunnel boring machine. The delays resulted from a combination of two factors. First, the Department of Defense has

received higher priority for ball bearings due to its supply needs for the Iraq war, and second, the bearing supplier has experienced manufacturing quality problems. The bearings have been received and the tunnel boring machine is currently being assembled on-site. WTD is addressing the following two items that this issue has caused:

- The East Tunnel contractor has indicated that it will pursue a time extension under the force majeure provisions in the contract related to delays beyond its control. To date, no estimates are available as to potential cost impacts.
- The schedule for completion of the Influent Pump Station (IPS) is closely linked to that of the East Tunnel. While delays to date are within a contractually allowed 90-day window for North Creek Portal site turnover to the IPS contractor, delays to the IPS could impact the schedule of other activities on the critical path, primarily testing of the Treatment Plant and related activities. WTD is monitoring the situation effectively and has been working closely with both the tunneling and IPS contractors to anticipate and resolve potential scheduling issues. WTD is developing contingency plans for testing at the Treatment Plant if completion of the IPS is delayed.
- As reported in our May 2007 report, the low bid for the IPS was approximately \$20 million higher than the engineer's estimate, and WTD was in the process of analyzing bid prices. WTD completed its analysis and has since awarded the construction contract. The contractor is currently preparing equipment submittals and preparing a baseline schedule.
- WTD is currently addressing several claims related to tunnel construction which are reported below under the "Claims/Change Orders" section.

## Treatment Plant

- Earthwork is underway on the site and is progressing smoothly. WTD has successfully addressed several differing site condition issues on the site, all of which have been covered by construction contingencies.
- WTD negotiated the Liquids Package Maximum Allowable Construction Cost (MACC) with Hoffman earlier this summer. Hoffman is currently in the process of obtaining subcontractor bids. Although it is in the early stages, Hoffman is experiencing mixed success in obtaining favorable subcontractor pricing. Favorable subcontractor pricing could provide buyout savings to WTD. But with unfavorable subcontractor pricing, WTD still does not face a cost risk since the GC/CM contract specifies a Guaranteed Construction Cost.
  - Despite a significant subcontractor outreach effort, Hoffman did not receive any bids for renovation of the StockPot Soup building into the Brightwater Operations Center. When this work was rebid, Hoffman was the only bidder. As allowed by the GC/CM contract, Hoffman can self-perform a limited percentage of the work if they are the successful bidder. With a value of \$2.69 million, this renovation work is within Hoffman's limitation of 30 percent of the MACC.
  - Hoffman has also received bids for the structures and concrete work under the Liquids Package. One bid was received on the concrete work, and it was lower than the MACC. The structures package bid amount was higher than the MACC, and the low bid was protested by another subcontractor. WTD is currently assessing the bid results.

- The Solids Package is the last significant construction contract for the Brightwater Project. WTD undertook a significant contractor outreach effort in the months since our last report. Five potential prime contractors have obtained bid documents for the work and attended the pre-bid meeting. Nonetheless, in our opinion, there remains a significant risk that Solids Package bids will exceed the engineer's estimate and/or the estimates underlying the 2007 Trend Report totals. As we recommended, WTD has developed a contingency plan that identifies the cost of various alternative courses of action in the event that the bids exceed the budget or that significant schedule issues are identified. This will allow WTD to fairly quickly determine whether to execute a contract for the Solids Package that is currently out for bid or to pursue an alternative. Bids are currently scheduled to be opened on October 25, 2007.
- The engineer's estimate for the Solids Package is currently being updated by WTD. This new estimate will also take into account the inflationary costs associated with time delays, and additional coordination or related costs resulting from separating this work from the GC/CM contract with Hoffman.
- Recently, WTD was informed by Snohomish County PUD No. 1 that the projected cost of the electrical substation is approximately \$7.2 million. This is higher than the \$4.6 million estimate provided in the 2007 Trend Report. King County and the PUD are still negotiating aspects of the substation project, which could reduce the current projected cost of the substation by approximately \$1 million.
- Since our May 2007 report, WTD has decided to standardize its Instrumentation and Control (I&C) system at all three of its wastewater treatment facilities. WTD anticipates negotiating directly with Emerson Process Management to provide and install the equipment. This change has required redesign of the system, and will require WTD to negotiate a deductive change order with Hoffman to delete this scope of work from the GC/CM work. WTD is in the process of assessing cost and impacts resulting from this change. WTD anticipates having this information available by the end of September.
- In addition to the three new contracts that have been bid or awarded since our last report, work has been completed on two project elements. Work was completed on both the Site Preparation and North Mitigation Area projects in August; final contract completion and closeout for these projects has yet to be attained.

## Follow-Up on OMC Recommendations

Our May 2007 report to the CBC included six recommendations that targeted areas which we felt could help WTD better manage cost and schedule risks associated with moving forward on the Brightwater Project. The actions that WTD has taken since May to implement these recommendations are summarized as follows.

- **Aggressive outreach to the construction contracting community.** To develop contractor interest and attain competitive bids on the Solids Package for the Treatment Plant, WTD made a number of one-on-one contacts with large contractors to inform them of the project and address concerns they had about the work. WTD held three contractor workshops during June and July and a pre-bid conference in August. WTD is in the process of reviewing its bid documents to address issues of concern that have been raised by potential bidders.
- **Develop a contingency plan to address potential Solids Package bid issues.** The Brightwater Project is largely now in construction, but the bidding risk for the Solids Package at the Treatment Plant remains, and in our opinion this is significant given the current bidding climate and recent cost escalation experienced in the region. Following our recommendation, WTD has identified a number of response alternatives (such as rebidding the Solids Package or splitting it into smaller work packages) in the event the bids are unfavorable. WTD has also developed cost and schedule impact estimates for each alternative. This will allow WTD to quickly evaluate its options if the bids are unfavorable.
- **Hoffman to review scopes of Liquids and Solids Packages.** Based on this recommendation, WTD had Hoffman review the scopes of work for Liquids and Solids Packages with the objective of identifying contractor interface issues and areas where work coordination and cooperation were especially critical. Hoffman completed this review in June 2007 and recommendations have been incorporated into the Solids Package that is currently out to bid.
- **Develop an integrated project schedule.** WTD has developed an initial integrated schedule for OMC review. Our review comments are being communicated to WTD for consideration. A final baseline integrated schedule will not be complete until contractor schedule information is obtained for the Marine Outfall, IPS, and Solids Package (estimated by the end of the year). An integrated schedule will allow WTD to identify schedule impacts of various project decisions.
- **Restate the 2004 Baseline Budget.** WTD and OMC have worked together to develop a cost reporting format for presenting detailed Conveyance costs. After this reporting format is finalized, Treatment Plant costs will be put in the same format, followed by a restatement of the 2004 Baseline Budget in this same format.
- **“Delegate down” specific levels of change order authority.** We have previously recommended that WTD consider delegating greater change order authority to the Brightwater Program Manager and construction managers. WTD is in the process of considering a change in the delegation of signature authority policy which may be available in the next few months. We are also working with WTD to develop a method to track the change order processing time.

## Analysis/ Findings

### Costs

The Brightwater Project has nearly completed its transition from design into full construction. Table 2 outlines the current construction contract status and notes the project elements that have been contracted since our May 2007 report.

Table 2  
Construction Contract Status

Under Contract Before May 2007	Contracted Between May and September 2007	Not Yet Under Contract
<b>Conveyance</b>		
East Tunnel	Influent Pump Station	Portion of Ancillary Facilities
Central Tunnel	Marine Outfall <sup>(1)</sup>	
West Tunnel	Portion of Ancillary Facilities	
Most of Ancillary Facilities		
<b>Treatment Plant<sup>(2)</sup></b>		
North Mitigation Area	Liquids Stream	Solids Stream
Site Prep/EDS		Environmental Education and Community Center
Earthworks		

1. Winning design-build proposal selected, which contains design-build price. Contract is not yet executed.

2. EDS is the Effluent Drop Structure.

Table 3 summarizes 2004 Baseline Budget costs, updates in WTD's 2005 and 2007 Current Conditions and Trends (Trend Reports), and conclusions reached in our review of WTD's 2007 Trend Report, based on the status of construction work negotiated or bid. This information is shown graphically in Figure 1.

For ease of review, all costs are shown in millions of dollars.

**Table 3  
Estimated Project Costs**

	2004 Baseline <sup>1</sup>		2005 <sup>2</sup> Trend	2007 Trend	Estimate Based on OMC Review of 2007 Trend	Observations
	3% Infl.	5% Infl.				
Conveyance	\$1,021	\$1,106	\$960	\$928	\$946 - \$952	<ul style="list-style-type: none"> <li>▪ IPS bid result is consistent with OMC's estimate based on our review of the 2007 Trend Report.</li> <li>▪ Marine Outfall winning proposal price of \$27.6 million (excluding sales tax) is less than 2007 Trend Report estimate of \$33.5 million.</li> </ul>
Treatment Plant	\$640	\$684	\$793	\$840	\$882 - \$911	<ul style="list-style-type: none"> <li>▪ Hoffman's Guaranteed Construction Cost (GCC) for Liquids Stream was negotiated on June 5 2007. Compared with Hoffman's previous 100% estimate, the scope was reduced to exclude certain owner furnished equipment. If changed scope items are taken into account, the Liquid Stream costs are trending closer to the 2007 OMC estimate.</li> <li>▪ Solids component not yet bid.</li> </ul>
<b>Total</b>	<b>\$1,660</b>	<b>\$1,790</b>	<b>\$1,753</b>	<b>\$1,767</b>	<b>\$1,827 - \$1,862</b>	

Note:

1. Source: Baseline budget. Escalated by WTD from baseline budget prepared by WTD at 3 percent and 5 percent annual inflation.
2. Developed by WTD in December 2005 and January 2007, respectively. These estimates are based on actual project costs to date and a 3 percent annual inflation rate for future costs.

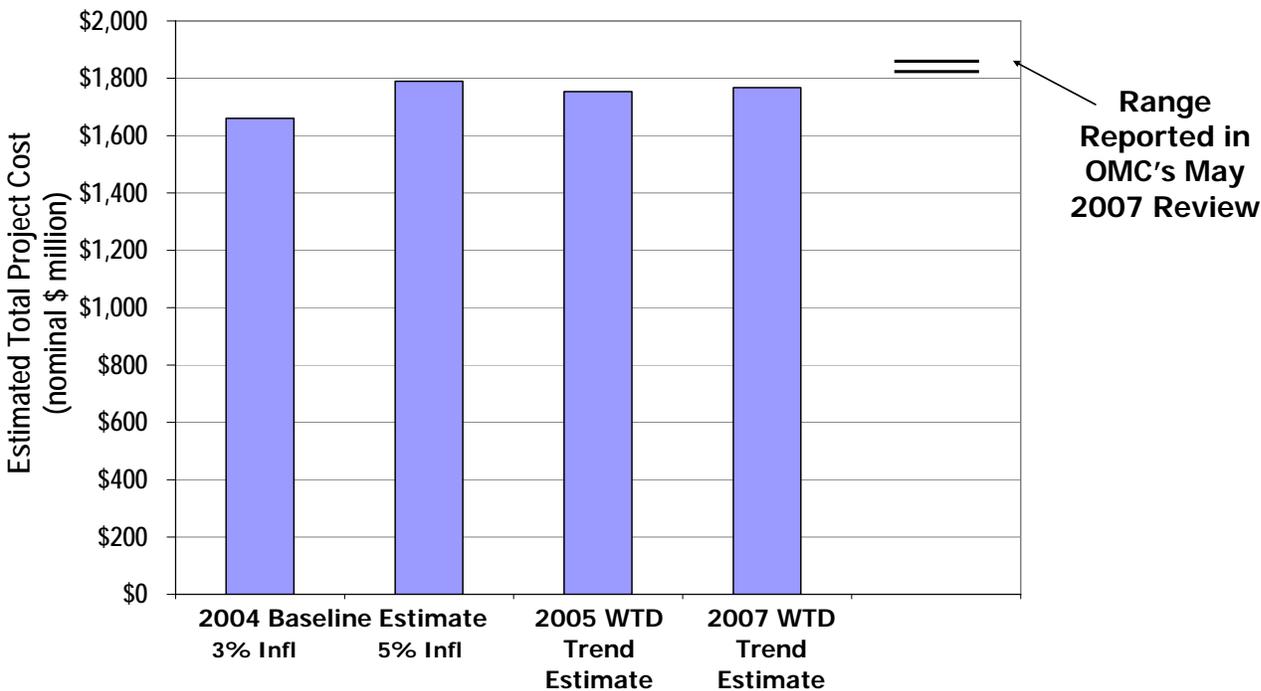
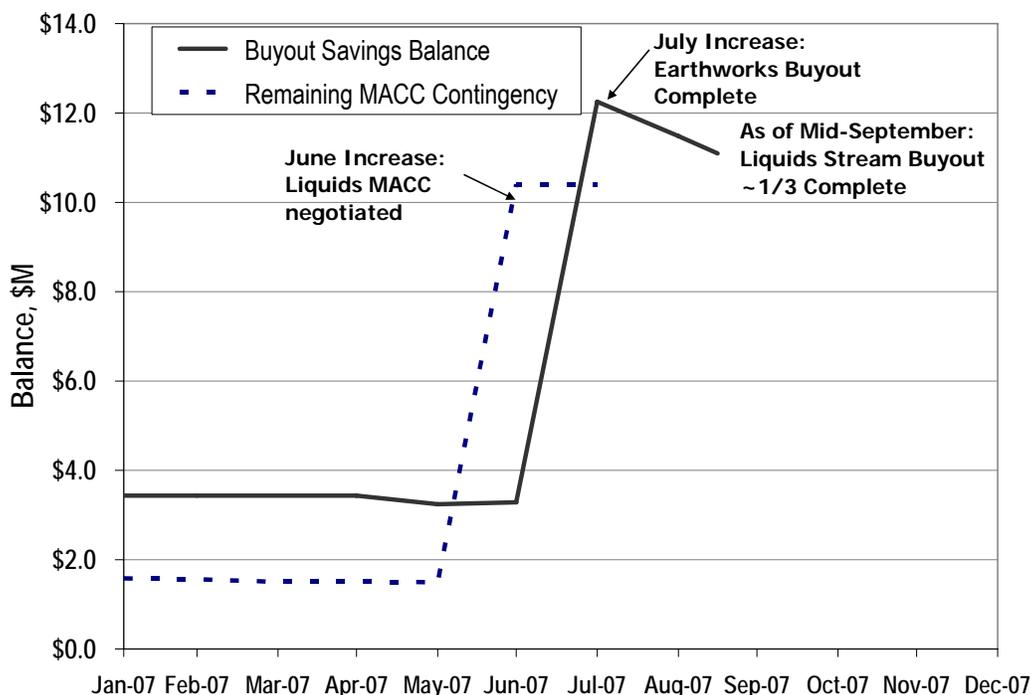


Figure 1. Estimated Project Costs

Under a GC/CM contract, a Guaranteed Construction Cost is negotiated and then the GC/CM Contractor bids out work to subcontractors.

The subcontract value may be different from the cost negotiated in the GCC, and if it is less, subcontractor buyout savings accrue to the County for the Brightwater project. If subcontract bids exceed the cost negotiation in the GCC, the County is not responsible for the additional cost. Under WTD’s GC/CM contract with Hoffman, “buyout savings” reduce the total Treatment Plant GC/CM contract cost, unless used for certain purposes specifically defined in the contract. In addition, a contingency for the project is held, which is termed the MACC Contingency. Upon closeout of the project, any unused MACC Contingency funds are returned to WTD. The running amounts of buyout savings and MACC Contingency for the Treatment Plant are shown in Figure 2, which currently accounts for the North Mitigation Area, Site Preparation, and Earthwork packages.



Notes:

1. MACC and Liquid Stream contingency and subcontractor buyout savings tracking is possible for the North Mitigation Area, Site Prep/EDS, and Earthworks projects. Data for the remainder of the Liquids Stream will be added when it is available.
2. As of July 31, the remaining MACC contingency was approximately \$10.5 million and the remaining subcontractor buyout savings was approximately \$12.2 million.
3. When contracted, the Marine Outfall and Solids projects do not have the potential for MACC contingency or buyout savings.

**Figure 2. Monthly Tracking of MACC Contingency and Subcontractor Buyout Savings**

Currently Hoffman is bidding the Liquids Package subcontracts. Five Liquids Package subcontracts have been bid to date. A number of subcontracts remain to be bid, which include the mechanical/electrical/plumbing (MEP), HVAC, I&C, and miscellaneous packages.

To date, Liquids Package subcontractor buyout is approximately a third complete, and subcontract bids exceed the MACC by approximately \$1.5 million, which has been primarily attributed by WTD to steel price escalation. Once the Liquids Stream buyout phase is complete, the total buyout savings and remaining MACC contingency will represent the maximum amount by which GC/CM contract costs may be reduced.

The most recent data available on Allied Costs comes from WTD's June 2007 Monthly Project Report. As of June 30, 2007, there had been no significant changes in projected Allied Costs from our May 2007 report.

## Risk Issues

WTD is using risk registers for the Treatment Plant and Conveyance activities to identify, address, and manage risks. The risk registers identify risks, categorize and classify those risks, and identify risk mitigation actions. Based on our review, WTD appears to be actively maintaining and updating the risk registers. The Treatment Plant risk register was most recently updated July 26, 2007, and the Conveyance risk register was updated on September 4, 2007.

In our opinion, most major risk issues for the Treatment Plant are identified in the risk register. These include, for example, lack of clarity on interfaces between Solids and Liquids contracts, poor coordination between Solids and Liquids contracts, interface with East Tunnel portal construction on the treatment plant site, impacts of delivery and pricing of owner pre-selected equipment, unavailability of equipment, delays in electrical substation construction, and various subsurface risks.

The risk registers for Conveyance are separated into the East Tunnel, West Tunnel, Central Tunnel, and IPS projects. Although many of the identified risk items are similar between the tunneling projects, certain site-specific elements have been addressed.

Looking forward, construction activity for the Brightwater Project will continue to increase. As discussed in previous OMC reports, tunneling is a major construction risk. While we believe WTD's construction contingency levels for Conveyance are appropriate, there remain outside risks such as major tunnel obstructions that could exceed the contingency amounts.

## Claims/Change Orders

To date, the number and value of claims and change orders on the Brightwater Project has been relatively low. This is due partly to the GC/CM delivery method, which specifies a Guaranteed Construction Cost for the majority of the Treatment Plant elements, and also because significant Conveyance tunneling has yet to be initiated.

- Conveyance Project change orders, pending claims and appeals, are currently at 1.8 percent of the contract award amounts. Executed change orders account for 0.7 percent. There are several pending claims and one appeal as described below.
  - A \$2.0 million claim by the East Tunnel contractor resulting from last summer's concrete plant labor strike was denied by WTD. The initial appeal has been denied by the appeal officer. The claim is now in mediation.
  - The East Tunnel contractor has initiated a force majeure time extension claim for the bearing issues.
- Treatment Plant change orders and claims are 0.7 percent of the original contract award value. There are no pending claims or appeals as of the end of July.

Table 4 tracks construction change orders against established construction contingency budgets and the percent of construction work complete. The intent of this table is to assess whether construction change order activity has the potential to exceed the established construction contingency budgets given current information.

**Table 4  
Change Order Tracking**

<b>Conveyance</b>	
▪ Work under contract:	West Tunnel, Central Tunnel, East Tunnel, IPS, some Ancillary Facilities
▪ Work in proposal/bidding:	Marine Outfall, some Ancillary Facilities
Value of Brightwater construction currently under contract (w/o COs)	\$540.7
WTD construction contingency for work currently under contract	\$68.8
Executed Change Orders	\$3.7
Pending Requested Change Orders	\$2.7
Executed Change Orders as percent of construction under contract	0.7%
% construction complete	14%
Executed CO as percent of construction contingency	5%
Executed and pending requested CO as % of construction contingency	9%

<b>Treatment Plant</b>	
▪ Work under contract:	NMA, Site Prep/EDS, Earthworks Liquids Stream
▪ Work in proposal/bidding:	Solids, EECC
Value of construction currently under contract (w/o COs)	\$318.7
WTD construction contingency for work currently under contract	\$21.3
Executed Change Orders	\$2.2
Pending Requested Change Orders	\$0.0
Executed Change Orders as percent of construction under contract	0.7%
% construction complete	12%
Executed CO as percent of construction contingency	10%
Executed and pending requested CO as % of construction contingency	10%

Note: All costs are shown in millions of nominal dollars.

## Schedule

We have reviewed WTD's draft Master Integrated Schedule and we are working with WTD to refine the integrated schedule, although contractor baseline schedules for the Marine Outfall, IPS, and Solids Package are not yet available. As these projects are contracted and detailed schedules are developed, they will be incorporated into the integrated schedule.

In our review of the schedule, we determined that the critical interface between the Treatment Plant and the Conveyance system is the clean water circulation test. To conduct this test, which is scheduled to start in December of 2010, it is critical for all systems to be operational for the project performance testing and evaluation.

Previously, the Conveyance system was on the critical path for project completion, while the Treatment Plant held significant float. Most recently, with the delays of the Solids Package contracting, the Treatment Plant is closer to becoming the critical path element. Currently, either the Treatment Plant or the Conveyance system could be the critical path element, changing on almost a daily basis as individual projects evolve.

Since our May 2007 report, the East Tunnel project has observed a delay resulting from the lack of available bearings for one of the tunnel boring machines. This has caused a two-month delay in deploying one of the two tunnel boring machines on this contract. This delay has not appeared to affect the critical path, but has shortened the amount of float for both the East Tunnel and Conveyance projects by 60 days.

In the coming months, WTD will observe a significant increase in construction activities and maintaining an active and up-to-date integrated schedule will be of paramount importance.

## Overall Management

With the split of the Treatment Plant project into GC/CM and hard bid components, an increased effort will be required on the part of WTD to control the Treatment Plant site with multiple contractors. In light of this change, we reviewed WTD's proposed construction management organization/staffing plan and determined that an appropriate level of staffing is being provided. WTD is concerned with filling the King County CM Contract Representative position for the Solids Contract with a qualified individual by this fall. WTD is actively searching for a candidate to fill this position.

## Recommendations:

As previously iterated, WTD is moving rapidly into numerous construction activities under the Brightwater Project. Although one major project element (Treatment Plant Solids Package) has yet to be opened/awarded, coordination of the site and coordinated scheduling will be paramount to controlling risk and successfully completing the project. As a result, we make the following recommendations for the next quarter:

- Ensure coordination of the GC/CM contractor with future contractors at the Treatment Plant site by closely reviewing schedules and mandating communication protocols between WTD and the contractors.
- Continue to develop the integrated construction schedule as contracts are awarded, and refine and update the schedule.
- Complete the ongoing efforts to restate the baseline budget in cost categories that facilitate understanding, tracking, and reporting of cost information.