



Metropolitan King County Council
King County Auditor's Office
Cheryle A. Broom, King County Auditor
King County Courthouse
516 Third Avenue, Room W1033
Seattle, WA 98104-3272
206.296.1655 Fax 206.296.0159
TTY 296-1024
www.metrokc.gov/auditor

MEMORANDUM

DATE: June 16, 2008

TO: King County Council Capital Budget Committee

FROM: Cheryle A. Broom, ^{CB} County Auditor

SUBJECT: Oversight Monitoring Consultant Review of the Brightwater Cost Update, 2008 Trend Report

Attached is the R.W. Beck (the Oversight Monitoring Consultant [OMC]) review of the Wastewater Treatment Division's (WTD) annual *Brightwater Cost Update, Current Conditions and Trends, January 2008* (2008 Trend Report). 2008 Trend Report was transmitted to the entire council by the executive on May 12, 2008. Highlights of the Beck review are complementary to and summarized in the June 2008 OMC quarterly construction status report, which will be presented to the council during the June 18th Capital Budget Committee meeting.

Briefly, the OMC report provides an analysis of the WTD's current Brightwater total program cost estimate compared to WTD's 2004 baseline budget and 2007 trend estimate. WTD's updated 2008 Trend Report estimate is \$1.802 billion. This estimate reflects a \$35 million (2 percent) increase over the 2007 trend estimate with increases in the Brightwater Treatment Plant of \$35.5 million and a \$.5 million offsetting decrease in the Conveyance costs.

The OMC review questions several elements of WTD's estimates and provides an update to its 2007 cost estimate showing overall Brightwater program costs at \$1.843 to \$1.849 billion, or \$41 to \$47 million higher than WTD's 2008 trend estimate. Based on the OMC's analysis, WTD's 2008 trend estimate likely understates the overall conveyance project costs between \$15 and \$17 million. The OMC's estimate reflects higher conveyance project contingency, staffing, and consultant costs given the risks associated with potential delays and required integration and tight sequencing of five construction contracts. The OMC also indicates that the treatment plant costs are likely to be \$26 to \$30 million higher than WTD's 2008 trend estimate due to their opinion of the need for higher treatment plant construction contingency, reduction in the buyout savings proceeds, and higher "end of job" staff and consultants expenses.

The Capital Projects Oversight staff will continue to work with the OMC and WTD to consider these factors and how they influence the total program costs during construction of the Brightwater project. Please contact Tina Rogers, the Capital Projects Oversight Manager, or me, if you have any questions or comments.

CB:TR:SB:yr

Attachment: Brightwater Project Construction Phase Oversight Monitoring Consultant Review of January 2008 Brightwater Cost Update--Current Conditions and Trends

cc: Metropolitan King County Councilmembers
Ron Sims, County Executive
Theresa Jennings, 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.
Saroja Reddy, King County Council Policy Staff Director
Mark Melroy, Senior Principal Legislative Analyst, King County Council
Capital Budget Committee
Beth Mountsier, Senior Principal Legislative Analyst, King County Council
Regional Water Quality Committee

Brightwater Project Construction Phase
Oversight Monitoring Consultant Report
(Quarter Ending March 31, 2008)

King County
Brightwater Project Oversight Services
Contract No. P43024



In association with



Brightwater Project Construction Phase
Oversight Monitoring Consultant Report
(Quarter Ending March 31, 2008)

King County
Brightwater Project Oversight Services
Contract No. P43024



In association with



Brightwater Project Construction Phase Oversight Monitoring Consultant Report Quarter Ending March 31, 2008

Final as of June 16, 2008

Table of Contents

Executive Summary	1
Overview.....	1
Status of Costs	2
Schedule.....	3
Progress on Previous OMC Recommendations	3
New OMC Recommendations	4
Brightwater Quarterly Report	5
Background	5
Analysis/ Findings.....	6
Follow-Up on Previous OMC Recommendations	10
New Recommendations.....	12

List of Tables

Table 1 Comparison with Baseline Budget and <i>2008 Trend Report</i> – Conveyance	7
Table 2 Comparison with Baseline Budget and <i>2008 Trend Report</i> – Treatment Plant.....	8

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.

Copyright 2008 R. W. Beck, Inc.
All rights reserved.

Brightwater Project Construction Phase
Oversight Monitoring Consultant Report
Quarter Ending March 31, 2008

Final as of June 16, 2008

Executive Summary

OVERVIEW

This Executive Summary presents highlights of the Oversight Monitoring Consultant's (OMC's), quarterly briefing on the Brightwater Project.

- **WTD Estimate of Overall Program Costs.** Since the OMC's last quarterly report, Wastewater Treatment Division (WTD) has completed its *2008 Trend Report*¹, which updates WTD's estimates of program costs. WTD's most recent estimate of overall program costs is \$1,802 million, or \$35 million (2.0 percent) higher than the estimate in its *2007 Trend Report*.
- **OMC Review.** In 2007, the OMC provided an opinion that Brightwater Program costs were likely to be between \$1,827 and \$1,862 million, or about \$60 to \$95 million higher than WTD's 2007 estimate. Based on our review of the *2008 Trend Report*², our current estimate is that Brightwater Program costs will be in the range of \$1,843 million to \$1,849 million. This range is narrower than our 2007 estimate reflecting more certainty around the value of construction contracts.

Table ES-1. Estimated Project Costs (nominal \$M)

	WTD 2004 Baseline 3% Infl. 5% Infl (\$Millions)	WTD 2007 Trend (\$Millions)	WTD 2008 Trend (\$Millions)	OMC Estimate Based on Review of 2007 Trend (\$Millions)	OMC Draft Estimate Based on Review of 2008 Trend (\$Millions)
Conveyance	\$1,021 - \$1,106	\$ 928	\$ 927	\$ 946 - \$ 952	\$942 - \$944
Treatment Plant	\$640 - \$684	\$ 840	\$ 875	\$ 882 - \$ 911	\$901 - \$905
Total	\$1,660 - \$1,790	\$1,767	\$1,802	\$1,827 - \$1,862	\$1,843 - \$1,849

- **Schedule.** The current program critical path runs through East Tunnel contract, to the Influent Pump Station (IPS), and then to Treatment Plant start-up. The most recent schedule information (dated March 2008) shows an 81-day delay in the completion of a key construction milestone. This delay, unless reduced, will result in a startup delay at

¹ *Brightwater Cost Update, Current Conditions and Trends, January 2008 (2008 Trend Report)*

² OMC's review of the *2008 Trend Report* was completed in June 2008 and is provided as a separate document.

the Treatment Plant. WTD reports that East Tunnel production in April 2008 was also below target but that May production improved substantially, making up about half the time lost in April.

Both the Central Tunnel and West Tunnel contracts are also showing delay, although they are not on the critical path. These contracts also have the potential to delay startup of the Treatment Plant depending on progress going forward.

- **Risks.** Looking forward, major risk issues include: unforeseen conditions during tunneling; as noted above, delay and coordination risks related to the East Tunnel; Central Tunnel, and IPS work at the North Creek portal; coordination and integration of work under two different prime contractors at the Treatment Plant; and potential delays in Treatment Plant startup caused by Conveyance delays.

STATUS OF COSTS

Cost trend information is summarized in Table ES-1 above. WTD's 2008 *Trend Report* estimate is \$35 million higher than its 2007 estimate, primarily reflecting actual construction contract amounts for the Treatment Plant that were higher than WTD's 2007 estimates. While WTD's 2008 estimate for Conveyance remains essentially unchanged, the overall estimate "masks" some significant underlying changes, including: 1) the actual construction contract for the IPS was higher than WTD's 2007 estimate; 2) a reduction in the overall Conveyance project contingency; and 3) a reduction in the Conveyance non-construction estimate. As discussed below, the OMC does not believe the off-setting reduction in the overall Conveyance project contingency is warranted at this time.

The right column of Table ES-1 updates the OMC's estimate of overall project costs in light of our review of WTD's 2008 *Trend Report* and our current understanding of the project schedule and risks. The OMC's estimated total project cost, excluding financing, is \$1,843 million to \$1,849 million, which is approximately \$41 million to \$47 million higher than WTD's 2008 estimate. The majority of this \$41 to 47 million range is because the OMC recommends carrying higher project contingencies for both Conveyance and the Treatment Plant. The range of the OMC's estimate has narrowed since 2007 (the low end of the range is higher and the high end is lower), primarily because bidding risk on the project has been all but eliminated, and subcontractor buyout for the Treatment Plant GCCM contract has been favorable. Nonetheless, we continue to believe WTD's estimate is low in light of schedule and other risk issues.

WTD reports the status of change orders and claims in its monthly construction reports. These reports characterize change orders as "executed," "costs negotiated; change order in progress" and "issues identified; costs not negotiated." For change orders in the last category, in some cases costs are listed as "to be determined" reflecting the fact that the contractor has not yet submitted a requested amount. This makes it difficult for the OMC to estimate the total potential financial risk exposure associated with these change orders.

SCHEDULE

The most recent Master Integrated Schedule available for our review (through March 2008) incorporated contractor-provided information except for the Solids/Odor Control facilities schedule, which is in the process of being incorporated into the Master Schedule.

The current program critical path runs through East Tunnel mining operations to the Influent Pump Station (IPS), and then to start-up / commissioning. The most recent East Tunnel Schedule shows that completion of Milestone 1 (the turnover of the site to the IPS contractor) is 81 days late. Unless this delay can be reduced, it will likely impact the IPS contract start date, and is currently projected to result in an estimated hydraulic completion (ability to accept water) date of February 22, 2011 and a delay in the start of commissioning to May 24, 2011. Commissioning is projected to be complete in late July 2011.

The most recent monthly reports available to the OMC (March 2008) showed good tunneling progress on the East Tunnel; however, data provided by WTD for April 2008 showed a slow-down in progress. Information from WTD on tunnel progress in May, after the maintenance shift was added by the contractor and weekend work commenced, has shown a significant increase in production. Nonetheless, even with good production going forward, it continues to be our opinion that the contractual date for Milestone 1 (November 24, 2008) will not be met. However, with good progress going forward it is possible that the last possible date that IPS work could start with a no-cost change order (January 14, 2009) might be met. Impacts from delaying Milestone 1 beyond January 14, 2009 include delay in starting IPS construction work, potentially conflicting with the Central Tunnel contractor who is scheduled to retrieve one of its tunnel boring machines from the North Creek portal in about that time frame, and, delay of hydraulic completion. It is important to note that both the Central Tunnel and West Tunnel are delayed beyond their baseline schedules. While not on the critical path for the overall project, further delays in these contracts could also potentially delay Treatment Plant startup.

For the Treatment Plant, the liquids stream schedule continues to show "zero float" which is essentially no change from our last quarterly report. The Solids baseline schedule is based on a preliminary, rather than WTD accepted, baseline schedule and shows some delay in certain activities; however, the actual amount is difficult to determine at this time, but should be available for the OMC's next quarterly report.

PROGRESS ON PREVIOUS OMC RECOMMENDATIONS

OMC made eight recommendations in its February 2008 quarterly report. Four of these recommendations were related to understanding the impacts and managing the risks of delay. WTD has made reasonable progress in implementing these recommendations. We recommend that they review and update this analysis on an ongoing basis. The frequency of these updates will depend on the degree to which risks change, but should be completed at least on a quarterly basis for OMC review.

Three recommendations were related to ongoing efforts to manage schedule and contractor integration. WTD is addressing these recommendations on an ongoing basis; however, a final approved baseline schedule that incorporates all approved contractor baseline schedules is not quite complete. We anticipate this information will be incorporated in the second quarter of 2008 and addressed in our next quarterly report. The final recommendation, which was to coordinate with the Auditor's Office as it implements its Capital Project Oversight program, is also being addressed on an ongoing basis.

NEW OMC RECOMMENDATIONS

Four additional OMC recommendations are offered at this time:

1. WTD should continue to update and refine its mitigation plans and strategies to manage the East Tunnel delay and potentially other Conveyance project delays.
2. WTD's "end of job" assumptions regarding staffing and consultant effort are likely optimistic and may not fully reflect the additional costs associated with currently expected delays or with contract processing and close-out. We recommend that WTD review its other historical large construction contracts to determine if adjustments to the end of job staffing and consultant assumptions are warranted. WTD should provide the results to the OMC for review as part of our 2008 third quarter report.
3. While the focus is on the East Tunnel Milestone 1, which drives the critical path, several other contracts, not on the critical path, are behind schedule by more than 30 days. This should continue to be monitored closely and evaluated on an ongoing basis to determine if the delays are indicative of other underlying problems that could pose cost or other risks later in the job.
4. WTD should conduct regular briefings with the OMC (i.e. quarterly or every other month) to review the status of change orders including the aggregate potential exposure associated with pending change orders and claims where a cost has not yet been submitted by the contractor and an ongoing assessment of the processing time for resolving change orders and claims.

Brightwater Quarterly Report

BACKGROUND

This report is a briefing on the Brightwater Project provided by the Project's Oversight Monitoring Consultant (OMC). The OMC's last report was dated February 15, 2008, and covered the period through December 31, 2007. On May 12, 2008, WTD issued its *Brightwater Cost Update, Current Conditions and Trends, January 2008 (2008 Trend Report)*.

We last reported to the Capital Budget Committee (CBC) on February 20, 2008. Since then, work has progressed on the East and Central Tunnels, and Marine Outfall. At the Treatment Plant, concrete work on many of the unit processes is underway, and sub-contractor bidding ("buyout") under the GC/CM contract is nearing completion. Foundations work under the Solids Package contract has been initiated.

Conveyance

- Work on the Marine Outfall contract is proceeding on schedule. Near-shore work is scheduled to begin by June 2008. The contractor is beginning to assemble the outfall pipelines in Everett and will barge them to the outfall location and sink them in place this fall.
- Delivery of the West Tunnel TBM has been delayed, with arrival expected sometime in June, 2008. Actual costs for use of the Paramount Property have not been resolved between the owner and WTD.
- The Central Tunnel construction is proceeding, although the contractor is showing some delay in meeting its baseline schedule. Two tunnel boring machines are working on the Central Tunnel: one eastbound and one westbound.
 - The delay is attributable to the westbound tunnel boring machine.
 - The eastbound machine is ahead of schedule. This, when coupled with the East Tunnel delay, poses the risk of conflicts between the East Tunnel, IPS, and Central Tunnel contractors at the North Creek Portal.
 - King County has resolved issues associated with acquiring an easement under a parcel of property owned by the City of Seattle.
 - WTD has completed its negotiations with Lake Forest Park Water District regarding the District's concerns that Central Tunnel construction may impact its aquifer.
- As reported in February, 2007, tunneling by the East Tunnel contractor is behind schedule. The East Tunnel contractor is projecting an 81-day delay in meeting its contract date for Milestone 1 based on a schedule update dated March 31, 2008.
- Kiewit Pacific Company, the IPS and Treatment Plant Solids Package contractor is revising its proposed baseline schedules based on WTD review.
- WTD is currently addressing several claims related to tunnel construction, as reported below under the "Claims/Change Orders" section.

Treatment Plant

- Work on the head-works, grit removal system, primary treatment, and foundations for the aeration tanks and membranes is underway by Hoffman (liquids contract).
- Work on the base slabs has been initiated by Kiewit Pacific (solids contract).

System Startup Planning

WTD continues with the development of detailed plans for start-up, testing and commissioning of the entire integrated Brightwater Project. Planning includes protocols for integrating operations staff, training, start-up and commissioning procedures as well as specific plans for running clean water and waste water through the facilities to test various systems. In our opinion, WTD continues to make excellent progress in looking at start-up issues, including instrumentation and control.

In the event that the Treatment Plant is ready to begin testing before the Conveyance system can be completed, WTD evaluated the option to install piping that will allow it to re-circulate water at the plant. This is a relatively low cost item, so WTD has decided to move ahead with its installation. This recirculation pipeline will allow for limited clean water testing in advance of Conveyance system completion, which will benefit the project by allowing the remaining testing to be completed on an accelerated schedule.

ANALYSIS/ FINDINGS

Cost

The OMC has prepared a detailed review of WTD's report titled *Brightwater Cost Update, Current Conditions and Trends, January 2008 (2008 Trend Report)*. Our *2008 Trend Report* review is provided in a separate document. Based on that review, overall, in our opinion the *2008 Trend Report* likely underestimates costs by about \$41 to \$47 million. The reasons are summarized below.

Conveyance. Table 1 is a summary comparison of Conveyance costs in the 2008 Trend Report, the 2007 Trend Report, and the Baseline Budget (nominal \$, 3 percent inflation).

**Table 1
Comparison with Baseline Budget and 2008 Trend Report – Conveyance**

Conveyance Project Cost Categories ⁽²⁾	Baseline Budget, 3% (\$Nominal) ⁽¹⁾	Baseline Budget, 5% (\$Nominal) ⁽¹⁾	2007 Trend Report (\$Nominal)	2008 Trend Report (\$Nominal)
Construction Subtotal	\$704.8M	\$768.7M	\$707.7M	\$723.5M
<i>Variance from 2007 Trend Report</i>				+\$15.8M (+2.2%)
Non-Construction Subtotal	\$226.3M	\$235.6M	\$201.6M	\$197.2M
<i>Variance from 2007 Trend Report</i>				-\$4.4M (-2.2%)
Project Contingency	\$89.5M	\$101.1M	\$18.2M	\$6.2M
<i>Variance from 2007 Trend Report</i>				-\$12.0M (-65.9%)
CONVEYANCE TOTAL	\$1,020.6M	\$1,105.5M	\$927.5M	\$926.9M
<i>Variance from 2007 Trend Report</i>				-\$0.6M (-0.1%)

Notes:

1. The Baseline Budget is shown at both 3 percent and 5 percent annual inflation rates.
2. Cost categories are those shown in the 2008 Trend Report. Baseline Budget and 2007 Trend Report costs originally appeared in different cost categories and costs were restated by WTD to facilitate comparison. Totals may not add up due to rounding.

Most of the 2.2 percent increase in WTD's *Construction* costs over the last year results from actual bid results for the Influent Pump Station, which was partially offset by favorable Marine Outfall pricing from the design/build contractor. Construction costs in Table 1 include construction contract amounts, executed change orders through December 31, 2007, and the remaining construction contingency after use of this construction contingency for those change orders. Most of the 2.2 percent reduction in *Non-Construction* costs reflects reductions in projected costs for *Engineering, Professional, and Consulting Services*.

The 2008 Trend Report reduces the Conveyance *Project Contingency* from \$18.2 million to \$6.2 million. While many of the pre-construction risks for Conveyance (i.e. bidding risk, SEPA compliance, and most permitting / property acquisition) have been resolved, there are still remaining "project risks" going forward that are above and beyond the construction risks associated with any single contract. Some of these include: the resulting delay to the overall project schedule caused by the East Tunnel schedule delay; the potential for further West Tunnel and Central Tunnel delays also to affect the overall schedule; price risk for Paramount's Point Wells property where a final price has not yet been agreed upon; and risks associated with the integration of the various Conveyance construction projects, especially the East Tunnel, IPS, and Central Tunnel work at the North Creek portal.

In our opinion WTD's 2008 estimates for staffing and consultants likely underestimate what actual costs will be near the end of the job (2011). In addition, if completion of individual contracts or the overall project is further delayed, consultant and staffing costs would also increase further. Considering these risks we do not believe that the overall Conveyance *Project*

Contingency should be significantly reduced at this time. Thus, in our opinion, the 2008 Trend Report likely understates overall Conveyance costs between \$15 million to \$17 million.

Treatment Plant. The following table is a summary comparison of the 2008 Trend Report costs with the 2007 Trend Report costs and the Baseline Budget (nominal \$) for the Treatment Plant.

**Table 2
Comparison with Baseline Budget and 2008 Trend Report – Treatment Plant**

Treatment Plant Project Cost Categories ⁽²⁾	Baseline Budget, 3% (\$Nominal) ⁽¹⁾	Baseline Budget, 5% (\$Nominal) ⁽¹⁾	2007 Trend Report (\$Nominal)	2008 Trend Report (\$Nominal)
Construction Subtotal	\$384.1M	\$419.5M	\$530.7M	\$550.9M
<i>Variance from 2007 Trend Report</i>				+\$20.2M (+3.8%)
Non-Construction Subtotal	\$235.1M	\$240.9M	\$315.7M	\$325.6M
<i>Variance from 2007 Trend Report</i>				+\$9.9M (+3.1%)
Project Contingency	\$31.2M	\$35.3M	\$4.0M	\$2.0M
<i>Variance from 2007 Trend Report</i>				-\$2.0M (-50.0%)
Adjustment for Lease/Rental Credits and Revenues	-\$10.8M	-\$11.3M	-\$10.6M	-\$3.2M
TREATMENT PLANT TOTAL	\$639.6M	\$684.4M	\$839.8M	\$875.3M
<i>Variance from 2007 Trend Report</i>				+\$35.5M (+4.2%)

Notes:

1. The Baseline Budget is shown at both 3 percent and 5 percent annual inflation rates.
2. Cost categories are those shown in the 2008 Trend Report. Baseline Budget and 2007 Trend Report costs originally appeared in different cost categories and costs were restated by WTD to facilitate comparison. Totals may not add up due to rounding.

Construction cost increases were due to developments that occurred after the publication of the 2007 Trend Report, including negotiation of the Guaranteed Construction Cost for the Liquids Package and award of a construction contract for the Solids Package. These increases were offset to some extent by favorable Liquids Package subcontractor buyout results. Most of the Non-construction cost increase from 2007 to 2008 is due to increased engineering services during construction, reflecting WTD's most recent consultant contract negotiations, which were concluded after the 2007 Trend Report was issued. In addition, WTD lowered its projections of lease and rental revenues.

It should be noted that WTD's 2008 estimate reduces the construction contingency for the Solids Package from over 10 percent to 7.5 percent (by \$4.1 million). At this stage, we believe some reduction is justifiable but that it is prudent for WTD to retain an 8 to 10 percent contingency on the Solids Package.

In 2008, WTD reduced the Treatment Plant project contingency from \$4 million to \$2 million. In our 2007 Trend Report review we recommended a Treatment Plant project contingency of \$22 million. Because of the ongoing risks associated with site coordination of the two contractors at the site, the potential for an overall delay in startup and commissioning, and

ongoing escalation risk sharing provisions in the contracts, we continue to believe that this higher Treatment Plant project contingency is warranted. As a result, it is our opinion that the 2008 Trend Report likely understates overall Treatment Plant costs between \$26 million to \$30 million.

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. These risk registers have not been updated since our last quarterly report. We continue to be of the opinion that these registers generally capture major project risks, and that WTD should update these registers on a regular basis. WTD is conducting more detailed analysis and contingency planning to address these risks outside of the more summary-level risk register format.

Since our last quarterly report, schedule and coordination risks associated with the East Tunnel delay, in our opinion, have increased. However, the East Tunnel contractor has implemented some mitigation measures (i.e. implementing a maintenance shift) that potentially will reduce the amount of delay. Outside risks such as major tunnel obstructions could occur and could exceed construction contingency amounts. In addition, the West Tunnel and Central Tunnel are delayed though not currently on the overall critical path. Further delays in any one of the tunnel contracts could adversely affect the planned timing of startup and commissioning for the Treatment Plant.

Several of WTD's construction contracts contain risk sharing provisions to address inflation escalation. For certain materials, the construction contractor can document changes in materials costs and recover the increased costs via change orders. WTD's exposure is up to approximately \$3.8 million for Conveyance and approximately \$1 to \$3 million for the Treatment Plant.

Claims/Change Orders

The most recent claim and change order data is from March 31, 2008. As of March 31, 2008, 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, which involves significant risk of unforeseen conditions, has yet to be initiated for certain tunnel segments, such as the West Tunnel.

- Conveyance construction progress is approximately 33 percent, measured as percent of contract value earned by contractors, while executed Conveyance change orders are approximately 12 percent of WTD's construction contingency.
- Treatment Plant construction progress is approximately 15 percent, measured as percent of contract value earned by contractors, while executed Treatment Plant change orders are approximately 4 percent of WTD's construction contingency.

WTD reports the status of change orders in its monthly construction reports. These reports characterize change orders as "executed," "costs negotiated; change order in progress" and "issues identified; costs not negotiated." For change orders in the last category, costs are listed where the contractor has provided a specific monetary request, and the County's cost exposure is likely to be at or less than the contractor-provided amount. For other change orders in the last category, the amount is listed as "to be determined" reflecting the fact that the contractor has not yet submitted a requested amount. This makes it difficult for the OMC to estimate the total potential financial risk exposure associated with these change orders.

Schedule

The current program critical path runs through East Tunnel mining operations to the IPS, and then to start-up / commissioning. The most recent East Tunnel Schedule (dated March 2008) shows that completion of Milestone 1 (the turnover of the site to the IPS contractor) is 81 days delayed from the contract completion date. This delay, unless reduced, will impact the IPS contract start date, resulting in an estimated date for hydraulic completion (ability to accept and circulate water) of February 22, 2011 and an estimated start of commissioning of May 24, 2011.

Both the Central Tunnel and West Tunnel contracts are also showing delay, although they are not on the critical path. However, all of these tunnel contracts have the potential to delay either full clean water testing or commissioning (receipt of sewage) for the Treatment Plant depending on progress going forward. The Marine Outfall is on schedule and unlikely to affect the critical path.

The most recent monthly reports (March 2008) showed good tunneling progress on the East Tunnel. WTD reported that production slowed down in April, and that good production was made in May after the East Tunnel contractor implemented a maintenance shift and scheduled weekend work. Although there is the potential to make up some of the current delay, we continue to believe that it is unlikely that the contractual date for Milestone 1 will be met, even though the degree of delay remains uncertain.

Overall Management and Staffing

WTD has provided projections for staffing and engineering / construction management support through 2011. These projections show a decrease in level of effort as construction is expected to be completed and facilities enter the testing and startup phase. OMC believes that these projections likely underestimate the level of effort that will be required at the end of the job for contract administration and close-out activities.

FOLLOW-UP ON PREVIOUS OMC RECOMMENDATIONS

Our previous quarterly reports have included status reports on recommendations that targeted areas which we felt could help WTD better manage cost and schedule risks associated with moving forward on the Brightwater Project. Following is a report on recommendations from our

last quarterly report, as well as any prior recommendations that have not been completely resolved.

- **Continue to develop the Master Integrated Schedule, keep it up to date, and evaluate it on an ongoing basis.** Contractor baseline schedule information, except for the contractor's baseline Solids schedule, is being updated regularly in the Master Integrated Schedule. WTD anticipates having the WTD-accepted Solids baseline schedule incorporated into the Master Integrated Schedule prior to the OMC's next quarterly report.
- **Ensure coordination of the GC/CM and Solids package contractors at the Treatment Plant site by closely reviewing schedules and mandating communication protocols between WTD and those contractors.** Weekly coordination meetings are being held between the GC/CM and Solids contractors. WTD reports that contractors are working cooperatively to resolve any potential schedule and site access conflicts.
- **Take the following steps to better understand the impacts and manage the risks of delay, especially for the East Tunnel:**
 - Engage and facilitate the Central Tunnel, East Tunnel, and IPS contractors in partnering sessions to develop creative solutions to the East Tunnel schedule delay, such as ways to allow multiple contractors to be working simultaneously at the IPS site.
 - On a parallel track, evaluate the overall costs and risks of a Conveyance System and/or overall project delay in terms of construction contract terms, WTD staffing and consultant costs, and other risk costs.
 - Identify the "drop dead" dates for making key decisions that affect the overall Project schedule including the decision to construct recirculation capability at the Treatment Plant; and
 - Closely monitor progress on the East Tunnel production rates and on the Treatment Plant over the next two to three months, and develop an overall project schedule mitigation plan if warranted.

WTD has held meetings with contractors to discuss options, and met with the East Tunnel Joint Venture partners in early June 2008. The OMC attended a briefing on the status of its evaluation of costs, risks, and mitigation strategies for managing the effects of East Tunnel delay on other contractors. In our opinion, WTD has taken reasonable steps to evaluate scenarios, risks, risk costs, and potential mitigation measures related to delay. Ongoing review and updates to this analysis are warranted; the frequency should depend on the extent to which new information could change the conclusions of the analysis. We recommend this occur at least quarterly and that WTD brief the OMC on the results.

- **Continue with implementation of monitoring systems to gather data related to tunneling production in order to more proactively address potential construction delays and cost issues.** WTD has closely monitored tunneling production and has provided the OMC with updated production estimates on a bi-weekly schedule.

NEW RECOMMENDATIONS

1. WTD should continue updating and refining mitigation plans and strategies to manage the East Tunnel delay and, potentially, other Conveyance project delays.
2. WTD's "end of job" assumptions regarding staffing and consultant effort may be optimistic and likely do not fully reflect the costs associated with delays expected at this point or with contract processing and close-out. We recommend that WTD review its other historical large construction contracts to determine if adjustments to the final year (2011) staffing and consultant assumptions are warranted. WTD should provide the results to the OMC for review as part of our 2008 third quarter report.
3. While the focus is on the East Tunnel Milestone 1, which drives the critical path, several other contracts are behind schedule by more than 30 days. This should continue to be monitored closely and evaluated to determine if the delays are indicative of other underlying problems that could pose cost risks later in the job.
4. WTD should conduct regular briefings with the OMC (i.e. quarterly or every other month) to review the status of change orders and claims including the aggregate potential exposure associated with pending change orders where a cost has not yet been submitted by the contractor and an ongoing assessment of the processing time for resolving change orders and claims.