

Status Report
Modeling Technical Review Group (MTRG)
Savannah Harbor Expansion Project
June 6, 2002

A meeting was held on Thursday, June 6, 2002 in Atlanta, GA at the EPA offices. The following persons attended the meeting and participated in the MTRG discussions:

Bo Ellis	ATM	843-884-8750	boellis@worldnet.att.net
Matt Goodrich	ATM	843-884-8750	mgoodrich@appliedtm.com
Wade Cantrell	SCDHEC	803-898-3548	cantrewm@columb32.dhec.state.sc.us
Larry Neal	LAW-Harbor Comm.	770-499-6791	lneal@lawco.com
Eduardo Yassuda	ASATM Brazil	843-884-8750	eyassuda@asatm.com.br
Daniel Mendelsohn	ASA	401-789-6224	dmendelsohn@appsci.com
William Bailey	USACE	912-652-5781	william.g.bailey@sas02.army.mil
Jack Blanton	Skidaway Inst.	912-598-2457	jack@skio.peachnet.edu
Paul Conrads	USGS	803-750-6140	pconrads@usgs.gov
Larry Keegan	LGE	912-352-3000	lkeegan@lg.com
Jim Greenfield	EPA-R4	404-562-9238	greenfield.jim@epa.gov
Bob Scanlon	Harbor Committee	912-644-7778	bscanlon@ci.savannah.ga.us

Comments on the Hydrodynamic and Salinity Model Approval Package

Bo Ellis began the meeting by stating that the Hydrodynamic and Salinity Model Approval Package review is ongoing. No written comments have been received from the agencies.

Larry Neal noted that he emailed his comments following the previous MTRG meeting.

Jack Blanton stated that Harvey Seim emailed their comments. Blanton and Seim feel that the statistical comparison of the model to measured data looks good, but they need to see more dynamical comparisons (e.g., progressive salt flux), to be confident that the model is transporting salt correctly.

Paul Conrads inquired if the USGS salinity data was included in the revision to the Approval Package. It was confirmed that the data was included.

Presentation of Transport Comparisons for BFHYDRO and BFWASP

Daniel Mendelsohn presented a comparison of the mass transport calculated by the hydrodynamic model and the water quality model. He explained that the hydrodynamic model is executed at a 5-minute time step and saves the current field information to an external file at hourly intervals. The data is not exported every 5-minute time step to conserve hard disk space. The water quality model reads in the hourly current field data and interpolates to smaller time steps. This interpolation process causes some differences in the transport calculated by the two models. However, a test simulation found that when the hydrodynamic information is saved every time step, and the water quality model is executed at the same time step, the calculated transport in the two models are nearly identical.

Presentation of the Water Quality Model Calibration Progress

Eduardo Yassuda presented the water quality model calibration progress.

Jim Greenfield suggested that the water quality model be started at an earlier date such that the model is spun-up by Aug 1.

Jim Greenfield recommended that segment averaging be used for post-processing of the model results. The segmented area should include the Front River, Back River, and Little Back River. The segments should be approximately 5 miles long and include areas of similar bathymetry and salinity characteristics. The segments should be centered around the monitoring station locations. The output from the segment averaging post-processor should include the percent volume below a user-specified concentration. Bill Bailey recommended that segments 9 and 10 be combined. Jim Greenfield recommended that the segment averaging tool be integrated to the WQMAP interface.

Point source discharges were discussed. The preliminary model set-up used time series loads for CBOD for all stations, and for NH₃ for Engelhard, based values recommended by the Waste Water Characterization Study. The remaining constituents were specified as a constant load. The model will be updated to utilize time series loads for all constituents. ATM will send the input load files to Larry Neal for his review.

Larry Neal stated that the rapid demand load at the Kerr McGee second discharge should be specified as a negative DO. He will provide the data necessary for this point load input. Mr. Neal will also determine if any measured DO concentrations are available for input at the point source discharges (rather than assuming a constant concentration times the measured flow).

Eduardo explained that the Covar method is utilized by the model to calculate reaeration. The hydraulic reaeration is driving the reaeration in the Savannah Estuary. A 0.5 m/s current speed is the threshold value that switches between the hydraulic and wind reaeration formulas.

An outline for the future progress of the model calibration was discussed by the MTRG. The group agreed that the calibration would complete the following tasks:

Task 0 – Boundary/Data Check – Show that all of the boundaries and loads are properly represented.

Task 1 – Transport – Demonstrate that the water quality model gives identical transport as the hydrodynamic model (compare currents, salinity and temperature).

Task 2 – DO Saturation – Show that the simulated DO saturation matches the DO saturation calculated from the measured data. Compare 1 hr average and 24 hr average. The results should agree within 5 percent error.

Task 3 – UBOD – Compare simulated UBOD to LTBOB samples. Check both carbonaceous and nitrogenous demand. Provide longitudinal comparisons of the data. This comparison will reveal if the model decay rates are appropriate.

Task 4 – Other Constituents – Compare measured and simulated concentrations of the other water quality constituents, including NO₃, PO₄, organic N, organic P, and chl-a.

Task 5 – DO deficit – Adjust SOD and reaeration to calibrate to DO deficit. Focus on 24-hr mean values. Perform sensitivity analysis for SOD and reaeration.

All of the model simulations throughout the calibration process should be saved. These runs may be utilized for a sensitivity analysis.

Comments on Previous Status Report

Bill Bailey recommended that the following line be deleted: "The ultimate acceptability of the model will be determined by the Federal Agencies." The state agencies will also have input regarding the ultimate acceptability.

Future Activity

- (1) Tasks 0, 1 and 2 will be completed within the next two weeks. Send out the results to the MTRG following completion of these tasks.
- (2) Draft water quality calibration package due by mid-August. Eduardo will distribute a draft of the calibration package contents soon.

Comments and questions related to this Status Report should be directed to Chris Ahern of ATM (cahern@appliedtm.com). The MTRG will meet again on August 20th, 2002 in the Atlanta Federal Building. Please contact Chris Ahern if you have any comments or recommendations for the next meeting.