

**TETRA TECH, INC.**

3200 Chapel Hill - Nelson Highway  
Cape Fear Building - Suite 105  
P.O. Box 14409  
Research Triangle Park, NC 27709  
Telephone: (919) 485-8278      Telefax: (919) 485-8280

**MEMORANDUM**

**To:            Technical Advisory Council Members**

**From:        Trevor Clements, Jon Butcher, Leslie Shoemaker, and Kimberly Brewer**

**Subject:     October 7, 2005 Technical Advisory Council Conference Call Summary**

---

A conference call for the Lake Maumelle Technical Advisory Council (TAC) was convened October 7, 2005 at 2:00 pm CST. Eleven of fourteen members were in attendance, and three Policy Advisory Council members (see attached attendance record). Trevor Clements moderated the call, and was supported in technical discussion by Dr. Jon Butcher, Dr. Leslie Shoemaker, and Kimberly Brewer on behalf of Tetra Tech, Inc.

Trevor Clements took roll call, and then reminded TAC members of the context of the call. The Policy Advisory Council has adopted goals and objectives for the Lake Maumelle Watershed Management Plan. Our technical approach is to establish indicators for the objectives, and then assessment methods for those indicators that will support evaluation of various management alternatives. The charge to Tetra Tech with the help of the Technical Advisory Council is to bring to the PAC at their October 20 meeting, recommended indicators, assessment methods, and preliminary information on targets. From the previous TAC meeting and conference calls, Tetra Tech and the Council reviewed and established threats to the objectives and a set of indicators for management assessment. Additionally, Tetra Tech proposed a three-scale linked modeling framework that evaluates impacts at the site-scale, links sites to the subwatershed-scale, that links to the lake at the whole-watershed scale and simulates lake response. Based on discussion with TAC members, methods were refined for the lake modeling.

The first agenda item for this meeting was to review the selected methods as revised after the last meeting. Trevor referred the group to the emailed handout, "Linking Threats to Assessment Needs, Indicators, and Methods (updated 10/6/05)." Discussion ensued as follows:

Alan Clingenpeel asked how the HSPF model handles roads, likely to be the greatest source of sediment in many parts of the watershed. Dr. Butcher responded that this was an area where HSPF assumptions could be refined by some supplemental efforts. He agreed with Mr. Clingenpeel that WEPP would be an appropriate tool to look at sediment loading from unpaved roads in the forested portions of the watershed.

Bruno Kirsch had emailed some information on a model called INFLOW, which was developed for the American Water Works Association Research Foundation for the evaluation of viable *Cryptosporidium* concentrations. Dr. Butcher reported to the group on its applicability to Lake Maumelle. The INFLOW model is a reservoir transport routine that is based on a two-dimensional Australian reservoir model called DYRESM. The model predicts the movement of river flows entering a lake and estimates the reduction in *Cryptosporidium* concentrations based on settling rates and UV inactivation. Dr. Butcher noted that

the same calculations can be addressed in the CE-QUAL-W2 formulation. The INFLOW documentation provides useful information on model parameters to address this issue.

Ashley Pope asked what we can expect the accuracy of the model predictions to be for the selected methods. Dr. Butcher indicated that the accuracy will be related to overall uncertainty for the various predictive methods. The technical team's understanding of uncertainty will take shape as the calibration effort occurs, and we will be able to report accuracy levels throughout the project once the analyses have been performed.

Ashley Pope then asked about whether location in the lake made a difference regarding modeling accuracy. Dr. Butcher answered yes, the level of uncertainty is likely to vary by location. At the upstream end of the lake, concentrations of nutrients and other constituents are likely to vary quickly in time in response to river inputs, while concentrations near the dam will be more stable due to mixing into the lake volume. As a result, uncertainty in predictions is likely to be higher in the upper part of the lake.

The group then turned to the next item on the agenda, preliminary recommendations for targets. Council members were referred to the handout, "Preliminary Targets for Selected Indicators." A brief overview was provided. Tetra Tech's initial approach was to list regulatory requirements as an absolute minimum, and then recommend targets that are more in line with the stated goals and objectives where they require going beyond the regulatory minimums. Some targets should be treated more as benchmarks, and its more important to compare relative abilities of management options to achieve multiple benchmarks simultaneously. Tetra Tech's experts also pointed out that targets can differ spatially and in time. The TAC members offered several comments and asked several questions as follows:

Carl Stapleton indicated the importance of looking at some impacts on a seasonal basis, identifying key locations in the watershed to compare based on data and modeling capabilities. Munsell McPhillips seconded the need to place specific targets at specific locations in the watershed.

Dr. McPhillips also asked whether we could set thresholds for the targeted indicators. The collective answer was yes, where the analyses are amenable to this approach. Some initial ideas for thresholds are in the table, and others need yet to be defined. Mr. Clingenpeel felt it would be important to set a cap on the increase of contaminant loads, particularly sediment load that would be used to work backwards to identify management needs in the watershed.

Ms. Pope asked how the target approach will address assessment of toxic concentrations at the intake. Dr. Butcher answered that this will be done in two ways. For constituents (like herbicides) that are expected to have widespread use in the watershed, the linked watershed-lake model can be used to estimate concentrations at the intake, which can then be compared to drinking water standards or other guidelines. For many other toxic constituents, the major risk would occur from spills, particularly during transportation. The approach for potential spills is to minimize the potential risk to concentrations at the intake based on location. The assessment for this risk can be undertaken in terms of the relative reduction in concentration between points in the watershed and the intake, calculated using the models. Those points for which the reduction is smallest present the greatest risk of impact from spills and should therefore receive the greatest focus for limitations on storage or transport of hazardous materials.

Alan Clingenpeel pointed out that the watershed crosses from the Ouachita Mountains Ecoregion to the Arkansas River Ecoregion, so references to ecoregion criteria should reflect this. [This is where the ecoregional boundary is defined by the State of Arkansas, and differs from the ecoregion maps provided by USEPA, which show the lake wholly within the Ouachita Mountains ecoregion.] Dick Cassart mentioned that since several of the indicators have no regulatory standards in place, this might be an opportunity to propose rule-making for specific standards using the state's third-party rule-making provisions.

Dr. McPhillips stated concern that turbidity is an end response ("equivalent to end-of-pipe") and that we need to set targets that address the problem earlier in the process. Dr. Butcher pointed out that turbidity

was only one of the indicators, and that targets for sediment loading from the land surface could be set to address this point.

Bruno Kirsch indicated that CAW wants to maintain levels in the water supply well below the regulatory requirements where possible.

Jim McKenzie indicated concern regarding the indicator “percent of watershed with lake views impacted.” He felt this was too limiting, and that it would be important to have a visual preference survey along with the predictions. Kimberly Brewer pointed out that our methods summary shows that both stakeholder input and these indicators are being proposed for the management evaluation process.

Mr. McKenzie also pointed out that administrative cost is key to being able to implement the plan, so it will be important to provide that information for all options under consideration.

Dr. McPhillips asked how Tetra Tech plans to portray risk to the Policy Advisory Council and public (this can be a difficult concept to communicate effectively). Ms. Brewer gave the example of an approach that we have used successfully in previous watershed planning processes that uses “thermometer” graphics showing the risk of not meeting objectives or ability to meet objectives in order to compare the relative differences between management options.

Trevor Clements briefly discussed the next steps that would be occurring after the October 20 PAC meeting. The team will be preparing a Quality Assurance Project Plan (QAPP) that will describe the proposed methods in more detail and how the team will address quality assurance and uncertainty. In December through February, the project team will focus on working with the TAC and PAC to review management options and assumptions for the baseline analysis. Several members of the TAC will likely be called upon to help identify local conditions and considerations to support development of modeling assumptions and best management options.

Ashley Pope emphasized the importance of broad public involvement in the management plan development process.

Tetra Tech thanked the Council members for their participation over the past four weeks to help the team adequately prepare for the October 20 PAC meeting, and invited them to attend that and all future meetings. Trevor indicated that it will be awhile before the TAC convenes again, but that the Council Members would be emailed a meeting summary and the draft QAPP when it was completed. In the interim, some individuals may be called directly to begin helping on the baseline analysis assumptions. The meeting was adjourned.

## Technical Advisory Council Member Attendance

Meeting Date: October 7, 2005

(P indicates present; NP indicates not present)

<u>MEMBER NAME</u>	<u>REPRESENTING</u>
<u>NP</u>	ARKANSAS NATURAL RESOURCES COMMISSION
<u>P</u>	ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
<u>P</u>	U.S. FOREST SERVICE
<u>NP</u>	UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES
<u>P</u>	U.S. GEOLOGICAL SURVEY
<u>P</u>	AUDUBON ARKANSAS
<u>P</u>	CENTRAL ARKANSAS WATER
<u>P</u>	LITTLE ROCK DEPARTMENT OF PLANNING & DEVELOPMENT
<u>P</u>	METROPLAN COUNCIL OF LOCAL GOVERNMENTS
<u>P</u>	DELTAIC TIMBER CORPORATION
<u>P</u>	ARKANSAS DEPARTMENT OF HEALTH
<u>P</u>	PULASKI COUNTY DEPARTMENT PLANNING & DEVELOPMENT
<u>NP</u>	ARKANSAS FORESTRY COMMISSION
<u>P</u>	UNIVERSITY OF ARKANSAS AT LITTLE ROCK, ENVIRONMENTAL HEALTH SCIENCES
<b><u>OTHERS</u></b>	
Canada, Shani	CENTRAL ARKANSAS WATER
Brewer, Kimberly	TETRA TECH, INC.
Butcher, Jon	TETRA TECH, INC.
Clements, Trevor	TETRA TECH, INC.
Shoemaker, Leslie	TETRA TECH, INC.
Althoff, Kate	POLICY ADVISORY COUNCIL
Dicker, Herb	POLICY ADVISORY COUNCIL
Dicker, Pat	POLICY ADVISORY COUNCIL