Appendix L2

Tennessee Source Water Assessment Program
Advisory Committee Meeting
September 3, 1998

This meeting was the initial meeting of the Source Water Assessment Program (SWAP) Advisory Committee. The first hour of the meeting Tom Moss, Source Water Protection Coordinator for Tennessee, gave an overview of existing source water protection activities with particular emphasis on Tennessee's Wellhead Protection Program and Drinking Water Program within the Division of Water Supply and the tie ins with other agencies within the Department of Environment and Conservation and the Department of Agriculture.

Tennessee's Wellhead Protection Program is essentially complete to address the Source Water Assessment portion for the ground water systems. Two things will have to addressed for ground water systems:

1) a susceptibility analysis to determine how vulnerable a system is to contamination (will use Aquifer Vulnerability from 1992 Aquifer Assessment) and
2) 2) the assessment report (wellhead protection reports are in a different format and not available electronically).

A notebook of handouts relative to the presentation was provided to the attendees:

Purpose of Source Water Assessment/Protection

Committee Invitees

Committee Questions – Questions the SWAP Committee is specifically to address as given in EPA's Source Water Assessment and Protection Guidance Document. **These are critical to address.**

Ohio Recommendations – Recommendations/Conclusions from Ohio's SWAP Committee. Note that a major portion of Ohio's meeting was taken up in determining how they would address wellhead protection. Tennessee's Wellhead Protection Program is well underway. **These are critical to review.**

PWS Map – locations of community public water systems using ground water and community and noncommunity systems using surface water

Violations Report - 1997 Report of Drinking Water Violations. Note there were no chemical violations. They are all "paperwork' violations (failure to monitor or report).

New Source Evaluation Form

Wellhead Protection Regulations – requires all public water systems using a ground water source to develop a wellhead protection plan. Promulgated in 1994. Note many states had made this voluntary but the new Source Water requirements have made this mandatory as Tennessee had already done. There is a 101 page guidance document that was written to accompany these regulations.

Under the Influence – Ground Water Systems that have been tested to show surface water influence (biological contaminants such as bacteria, protozoa, insect parts, algae). These systems are much more vulnerable than "true ground water" systems and are required to filter as if they were surface water.

Vulnerable Aquifers – Map from draft 1992 Tennessee Aquifer Assessment showing areas more prone to contamination (sand aquifers with no confining layer and Valley and Ridge karst)

DWSRF Allotments – States can use up to 10% of their allotment for Source Water Assessment activities. The SWAP money is one-time-only money.

Water Intakes & Discharges – Public Water System Intakes and Permitted Stream Discharges
Storm Water Discharges – Permitted Storm Water Discharges. Note the locational information for the database is very inaccurate and the intent of the assessments is to improve this database. All facilities with storm water permits must develop a Pollution Prevention Plan (regulation provided later in notebook)

Proposed Inventory Scenario

5 Mile Time of Travel – Hours of travel at various velocities relative to five miles distance (a relatively high velocity of 1 ft/sec gives about 8 hours; more typical would be .2 - .4 ft/sec)

15 Mile Time of Travel - Hours of travel at various velocities relative to fifteen miles distance (a relatively high velocity of 1 ft/sec gives about 24 hours; more typical would be .2 - .4 ft/sec)

Stormwater Database – Examples from Storm Water Discharge Permit Database. Note the second page is actually a continuation of the first (e.g., Maytag info is on top of both pages). Note SIC (Standard Industrial Classification) code is tracked.

Pollution Prevention Plans – Regulations requiring the development of a pollution prevention plan (including chemicals onsite, diking, spill prevention) for facilities with storm water discharge permits. This is seen as a cornerstone of Source Water Assessments. Note they are not required to turn these plans in but appropriate plans upstream of intakes will be requested.

SIC Codes – Standard Industrial Classification Codes basic breakdown. These codes will be used to focus on particular industrial activities which have been a problem (will have to narrow down list – SIC codes exist for nearly every activity including churches, doctors' offices, etc.). Intend to use Phone CD ROM database that uses SIC codes and gives locational information to address facilities not now on stormwater database.

Atrazine Hits - These samplings were worst case scenario and do not reflect water being withdrawn by the public water system. Sampling was at the surface ("oil slick" intentionally sampled if present) after major rainfall in growing season. Intakes are at the bottom of the stream. Tennesse does not have the problem of western states. This should be more of an education issue than anything.

Nashville: 15 miles upstream – Nashville's intakes with fifteen miles upstream marked to show what dischargers are within the watershed.

Monitoring – Standard Monitoring Framework. This lists all of the chemicals and biologicals currently monitored for by water systems. Standard Monitoring is $16,000 for sampling cycle. Ground water concerns are typically solvents, which are relatively cheap. A whole suite of volatile chemicals (which includes gasoline, solvents and degreasers) can be run for approximately $200. Note noncommunity systems are only required to sample for nitrates and bacteria.

Discussion after Overview Presentation

Note that these are not verbatim, but summarize the discussion.

Jones, TEC: Is liquid fertilizer a threat to public water systems?
Moss, TDEC DWS: Nitrates/urea are a concern but Tennessee hasn't shown much problem and the drinking water standard is 10 ppm.
Foster, TDEC DWS: Tennessee has had no nitrate problems except some noncommunity truck farms.
Nafe, TDA RS: Agriculture has done some nitrate testing along with pesticides but the technique was not accurate and has been discontinued.
Foster, TDEC DWS: Midwestern states are the ones that have severe nitrate violation problems due to more abundant row cropping and much lower rainfall/aquifer recharge.
Nafe, TDA RS: Storage areas have had problems. The Department of Agriculture has been working with TVA on improving storage areas with model (demonstration) sites at large AG dealers and there are regulations in draft form.
Jones, TEC: A large barge facility was recently permitted on the Cumberland River upstream of Clarksville.
Nafe, TDA RS: These facilities are required to have lined/bermed fertilizer tanks able to hold1 ½ times capacity of the tank.

Moss, TDEC DWS: The message to the medical community (unfortunately those invited did not attend): immune deficient or compromised persons should be boiling their water. We serve high quality water; however, immune deficient persons should boil water. Water systems cannot afford to serve distilled water. Approximately 95% of the water treated by a public water system is not used for drinking purposes. It is used for flushing, washing, watering purposes. Surface water systems have been required to filter for over 20 years.
Jones, TEC: Could some pathogens still get through filtration?
Moss, TDEC DWS: There are certain organisms that can grow in filters.
Foster, TDEC DWS: Concern should actually include food, clothes, etc. of immune deficient people. Some damaged organisms might make it through the filter. There is actually more concern after the water leaves the plant from regrowth in the distribution system, cross connections or too low of a chlorine residual.

Karen Stachowski, LOWV: – Could wetlands be a ground water issue?
Moss, TDEC DWS: There are some karst areas (limestone areas characterized by sinkholes, caves, springs, disappearing streams) that have sinkhole wetlands. Wetlands in one sense are ground wate – the water table is at the surface. Wetlands are not recharge areas for ground water – they are "at the bottom" of the recharge with recharge areas at higher elevation {wetlands are actually a ground water discharge area}. As far as surface water intakes are concerned, wetlands would likely not have the flow required for withdrawal.

Kirstner, Murf. Water Dept/AWWA: – This Committee needs a Division of Solid Waste Management representative since they permit landfills. One was permitted across from Murfreesboro's intake. I think the State Planning Office should also be involved since this could involve zoning, etc. on the local level. {SWM and Environmental Policy Office have been contacted and will be providing a representative. There is no longer a State Planning Office}
Moss, TDEC DWS: We have tried to keep Departmental representation low, but you have a good point. The Division of Water Pollution Control does have Memorandum of Agreement with Solid Waste Management and we are linked with Water pollution on ground water issues.

Jones, TEC: – SWAP doesn't really address private wells. Is there an opportunity for educational activities for private well owners such as places to go for testing, etc.?
Caruthers, TDEC DWS: Educational activities could stand to be expanded. Environmental education needs more emphasis.
Foster, TDEC DWS: The Farm A Syst program from UT Ag Extension is excellent way of addressing private well concerns. I would not want to leave the impression ground water is poor quality in Tennessee. Ground water is generally much freer of pathogens, etc. than surface water.

Moss, TDEC DWS: I have developed a Healthy Well Manual (pun intended) designed for school children that tells who to contact, not to dump trash in sinkholes, etc. that might be useful for the Department of Education.
Smith, TN Ag Extension – From the work we're doing in karst areas, it's common that people hook up to community water supply as soon as it becomes available which is probably for the best.
Moss TDEC DWS: With private wells the main problem is bacteria. Wells should be sampled every two years. Bacteria is what will most likely make you sick. The cost is $40 for the county environmentalist to do it. For those of us on public water, we're paying to have our water sampled, private well owners should do the same. A private lab will run volatiles for approximately $100 which would get you the other typical type of contamination (solvents and gasoline), but unless they are odd sheens, taste or odor that's probably not necessary.
Jones, TEC: Would there be any smell or taste to contamination?
Moss, TDEC DWS: With benzene or gasoline, by the time it could hurt you, you couldn't stand to drink it because of the odor and taste.
Jones, TEC: What about trichloroethylene?
Moss, TDEC DWS: Trichloroethylene is colorless and odorless.

Clark, UCC: In my area there is interest in the Emory Watershed and the Friends of the Obed is getting organized. I'm getting the impression things are getting away from chlorine to ozone. In Cookeville, the people won't drink their water because the water is not good in Cookeville. I read the federal requirements to mean that a public hearing is required in addition to the Source Water Assessment Committee {Correct – will do after the Committee has come to some conclusions}. There is no representation for HIV persons, immune deficient/suppressant. Pregnant women and children also have different requirements. Maybe League of Women Voters can help. I think we should be shooting for the day where the water is good for everyone. I'm surprised there are no bottled water representatives on this Committee. Most other states have them too.
Moss, TDEC DWS: We have tried to get the medical community involved. Both the Tennessee Medical Association and the American Cancer Society have been invited to be a part of the Committee. The other lady representing League of Women Voters has a husband who is a pathologist and the LOWV medical contact is a retired cancer doctor both have been asked for input. Ms. Fidler is unfortunately sick and unable to attend this meeting.
Foster, TDEC DWS: Consumer Confidence Reports will address what we test for and quality.
Moss, TDEC DWS: Some of the problems we run into are not health hazards, but taste and odor problems. Morristown has had to install charcoal filters due to taste and odor problems from industrial discharges upstream.
Foster, TDEC DWS: Some of these issues will be addressed by the Disinfection and Disinfection Byproducts rule coming out in November separate from SWAP. Pregnant women may be more vulnerable to disinfection byproducts. The new rule drops the level from 100 ppb to 80 ppb and eventually to 40 ppb. Alternate disinfection in the prefiltration stage is probably coming.

Moss, TDEC DWS: Chlorine reacting with organics produces these disinfection byproducts.

Clark, UCC: In a couple of watersheds I have noticed where the water treatment plant backwash is polluting the stream such as Caney Fork. Are they using a sand filter?
Foster, TDEC DWS: Sand filters and anthracite (coal). Some systems recycle their backwash after allowing for settling of solids. The solids have beneficial soil properties.; sand filters and (RLF anthracite coal) The stream near Cookeville probably nonsupportive from other reasons than the water treatment plant – its discharge shouldn't be hazardous. Alum is typically used for flocculant.
Wang, TDEC WPC: I think there are biological problems. We're looking at the biology of the stream rather than chemicals.
Carter, UCC: – The overuse of chlorine was common in New Jersey where I'm from.
Foster, TDEC DWS: Currently there is no maximum limit for chlorine. Systems are required to keep a residual of 2 ppm chlorine. There will be a maximum in Nov of 4 ppm. Most systems have a quenching agent to kill the chlorine before they discharge.

Clark, UCC: The headwaters of the Obed are in Crossville. All are nonsupporting from their watershed evaluation. This leads into the lake supplying water for 4 of districts in the county. Why is it nonsupporting? What is the relationship between nonsupporting and source water/drinking water. As we speak Corps of Engineers and your Department are looking at a development called Terrace on the Obed. One house is on a nondesignated wetland with a septic system into wetlands. By the way, New York City water isn't even metered and it always tasted good to me. {Moss had mentioned that New York does not filter their water previously}.
Moss, TDEC DWS: New York is serious about Source Water protection. The New England states are further along in some of the wellhead protection work and source water. Massachusetts was concerned about wellhead as far back as the 1600's when the governor said they weren't supposed to wash out pots and pans or laundry near the community well.

Caruthers, TDEC DWS: Alan Jones, are there river compacts out there besides Cumberland River Compact?
Jones, TEC: At least two or three. There is the Scenic Rivers Association and the Foundation for Global Sustainability; and TCWP at Oak Ridge.
Clark, UCC: There is also the Clean Water Network.
Upham, TDA NPS: there are 7 or 8 river associations/citizen basin groups in East Tennessee and 4 – 5 in Middle by various names. There are roughly 15 across the state.

Jones, TEC: What are the Consumer Confidence Reports supposed to contain?
Foster, TDEC DWS: Any violations of primary drinking water standards from the previous year and failure to monitor or report. There is also required language for

immune suppressed individuals, children and the infirm. The water they produce is supposed to be compared to bottled water. There is also to be other information to help them understand the report. There is not a requirement for a conclusion the water is safe to drink, but they would logically do so. There is a requirement to announce the availability of the Source Water Assessment and they must address the source of their water. They are to post the CCR on the internet if the system is greater than 100,000. The governor can give a waiver of direct mail to individual customers to systems smaller than 10,000

Jones, TEC: Are they not required to take detailed information from the Assessment?

Foster, TDEC DWS: No. It must address chemical results, failure to meet standards or monitoring. This addresses public right to know; however, public water systems with violations already have to give public notice by direct mail, newspaper and radio/tv for acute situations and have a month for other types of violations. Some of the language is poorly done and will raise unnecessary concerns. It does not discuss the natural process of filtration (ground water) and die off (surface water) organisms pathogenic undergo.

Clark, UCC: - Isn't this Committee supposed to address the Consumer Confidence Reports?

Foster, TDEC DWS: No. There will be regulations written up and a public hearing for that.

Jones, TEC: Will citizens be able to get the Assessments from the water systems or will they have to come to the state?

Foster, TDEC DWS: The citizens will have to come to the state. The water systems will have copies as well and could choose to put it in their CCR.

Moss, TDEC DWS: The State intends to use Wellhead Money from Drinking Water state Revolving Fund to set up GIS (geographic information system) webpage for ready access to SWAP information. Tennessee's wellhead protection work is mostly complete, but the information is not in a readily available electronic format as will be necessary for the assessments. Putting this on a webpage will allow anyone to use their internet access or go to the public library to check on their water supply.

Clark, UCC: Will EPA come out with Radon standard in water? Is there a problem in Tennessee like there was in New Jersey?

Foster, TDEC DWS: Ground water from Chattanooga Shale may have 600 picoCuries/liter and the standard will be 300 picoCuries/liter. The aeration commonly in use for iron and manganese problems would drive off radon.

Moss, TDEC DWS: Chattanooga Shale ground water has very poor quality water anyway (metals, sulfur) and isn't used much.

Jones, TEC: Will the Department of Environment and Conservation share its GIS with local government for planning purposes, etc.?

Moss, TDEC DWS: We're looking for GIS on the web to help. Anybody with an internet connection will be able to pull up not only public water system information, but also

Superfund, Water Pollution, etc. General Department staff will also be better served with internet GIS, which will be somewhat more idiot proof than all of the necessary software for standard GIS work.

Clark, UCC: Specialized places such as nursing homes or places treating immune deficient persons, senior citizen communities where people are on immune suppressants - would there be advice as to what the responsibility for a public water system is?
Moss, TDEC DWS: We can't require public water systems to serve sterile water. For instance, one woman allergic to phosphates wanted the water system to discontinue its use for erosion control (to keep down lead and copper problems) which would have cost hundreds of thousands of dollars. As it turns out, she wasn't even on that water system.
Foster, TDEC DWS: The Consumer Confidence Report refers immune deficient/suppressant people, etc. to the Center for Disease Control.
Clark, UCC: The advice is don't drink it.
Foster, TDEC DWS: The concern is primarily cryptosporidium. Boiling will kill it.
Clark, UCC: Ozone will kill it.
Foster, TDEC DWS: The problem is that water leaving the treatment plant is good; but there is regrowth within the distribution system or cross connections or ends of line where chlorine has dissipated. There are also other things to consider besides drinking water. Such as well cooked foods, not handling pets, etc.
Clark, UCC: We're giving dogs to cancer patients!
Foster, TDEC DWS: Drinking water is only one factor. They must take care of other areas of their life style.
Moss, TDEC DWS: Most complaints (probably >90%) the Division of Water Supply responds to are not a water contamination problem.
Foster, TDEC DWS: The last cryptosporidium case we investigated, the lady had a pet calf that she liked to kiss and it had nothing to do with the water {cattle are a major source of cryptosporidium – it's what gives cattle the scours).

Clark, UCC: There are a lot of different types of water lines going in, it looks like most is PVP (PVC?). Are the different types evaluated? How many communities have older water pipes which are asbestos?
Foster, TDEC DWS: We require replacement where there is aggressive water and low alkalinity. They also have to periodically monitor for asbestos. We have several systems with galvanized pipe and red water (iron) problems. There are secondary standards for iron and where there is a problem they must schedule them for replacement or change to cut the corrosivity of their water. After 1996 any fitting or conveyance or coating must be National Sanitation Foundation approved.
Clark, UCC: When I lived in Newark, New Jersey I had to replace solid lead pipe.
Foster, TDEC DWS: We really don't have that much in Tennessee but the Consumer Confidence Report must address lead in household plumbing as well.

Clark, UCC: Does the state require monitoring for anything beyond what the federal requirements are?
Foster, TDEC DWS: We do not monitor for anything additional than federal regulations. There are unregulated contaminants that must be monitored for. These are basically chemicals EPA feels they will need to regulate/set standards for in the future.

Attendees:

Alan Jones, Tennessee Environmental Council
Jennifer Tlumak, Tennessee Environmental Council
Joe Kirchner, Murfreesboro Water and Sewer
Greg Baker, Tennessee Association of Utility Districts (TAUD)
George Smith, UT Agricultural Extension Service
Donald Clark, United Church of Christ/Network for Economic and Environmental Responsibility
Karen Stachowski, League of Women Voters
Joel Walton, TN Department of Education
Stefan Maupin, TN Farm Bureau
John New, TN Municipal League
Tony Wyatt, TAUD
Bill Carpenter, TAUD

Tennessee Department of Environment and Conservation (TDEC)
Sherry Wang, Division of Water Pollution Control, Watershed Management Section
Robert Foster, Division of Water Supply, Deputy Director
Gordon Caruthers, Division of Water Supply
Tom Moss, Division of Water Supply

Tennessee Department of Agriculture
Ken Nafe, Division of Regulatory Services
Greg Upham, Division of Agricultural Resources, NonPoint Management Program

Committee Meeting

The October 20, 1998 Meeting was specifically to go over the Questions for the SWAP Committee from the EPA Guidance Document. Mr. Moses with the Division of Solid Waste Management discussed briefly the permitting process for landfills and provided handouts.

It was decided at this meeting to hold public meetings in the three grand divisions of the state -West Tennessee (Jackson), Middle Tennessee (Murfreesboro) and East Tennessee (Knoxville). The key question that remained at the end of the meeting was how the Susceptibility Analysis would be done. Mr. Moss indicated that he was checking to see what the other states were doing and that as soon as he had something together on it, he would send this information out to the Committee. As it turned out, the Susceptibility Analysis was developed specifically by Mr. Moss when he was unable to find a reasonable approach to follow from any of the other states.

The Susceptibility Analysis was distributed to the Committee immediately after the public meetings in late December. At the October meeting, it was determined that another meeting would be called if after they received the Susceptibility Analysis they were significant concerns or if there were significant comments for them to discuss after the public meetings. The Division did not feel there were questions/comments that arose from the public meetings that required a reconvening of the Committee. There were no contacts from the Committee requesting/advising another meeting was necessary to discuss Susceptibility Analysis.

Attendees:

Don Clark, UCC/NEER
Karen Stachowski, League of Women Voters
Chris O'Bara, TN Conservation League

Jenny Adkins, USDA Natural Resource Conservation Service
George Smith, UT Ag Extension Service
Larry Clark, TVA
Tim Higgs, Army Corps of Engineers

Larry Lewis, TAUD
Greg Baker, TAUD
Tony Wyatt, TAUD
Bill Dobbins, TAUD

Melanie Catania, TDEC - Environmental Policy Office
Tom Moss, Division of Water Supply
David Moses, Division of Solid Waste Management

Robert Foster, Division of Water Supply
Darlene Lipford, Division of Water Supply
Gordon Caruthers, Division of Water Supply
Richard Cochran, Division of Water Pollution Control
Ken Nafe TN Dept of Agriculture