

**South River Science Team
February 5, 2002 Meeting
DEQ, Harrisonburg, VA**

Agenda

- Welcome, introductions, etc. – Don Kain
- 2002 Routine Fish Monitoring – Billy Van Wart, Don Kain
- 2002 Water Sampling – Ted Turner
 - ✓ “Routine” Trend Monitoring
 - ✓ Bimonthly Clean Metals Sampling
 - ✓ Intensive Sampling Discussion
- Virginia Tech Fish Gut Study – Ralph Stahl, Tammy Newcomb
- Science Team Newsletter – Mike Liberati
- Lunch / Mud Map Presentation – Dick Jensen, Ted Turner
- Floodplain Soils – Annette Guiseppi-Elie
- Working Hypotheses – Ralph Stahl
- John Rudd Seminar at DuPont – Ralph Stahl
- Action Item Summary
- Next Meeting

MEETING SUMMARY

Welcome, introductions. Don Kain welcomed attendees and self-introductions were provided. Attachment 1 lists all attendees.

2002 Routine Fish Monitoring. Billy Van Wart provided a brief recap of DEQ's 2002 proposed fish sampling for mercury. A map with sample locations and a table with target numbers and species were handed out (See Attachment 2, pages 8-9). The details of DEQ's 2002 fish sampling program are in a draft QA Project Plan, which is available upon request. Sampling is scheduled to begin in April.

2002 Water Sampling. Ted Turner outlined DEQ's proposed water sampling plan for 2002. Planned sampling includes "routine" trend monitoring and bi-monthly clean metals sampling at approximately a dozen sites.

1. "Routine" trend monitoring is designed to provide a comparison to historic State Water Control Board / DEQ mercury water column sampling throughout the drainage. In the past, this sampling used conventional methodologies, which did not provide the low levels of detection found with today's "clean" metals techniques. DEQ proposes to use "clean" methods for this sampling. Station coverage will duplicate those sites sampled in the past (the 14 historic fish sampling sites), and will also include sites of newly added fish sampling stations (Hopeman Parkway, 2nd Street, and Route 50/7). This sampling effort will be a one-time event during 2002.

Action Item: DEQ to finalize QA Project Plan and proceed with sampling, probably in summer/fall 2002.

2. Bi-monthly clean metals sampling, begun in late 2001, will continue at sites sampled during November 2001 and January 2002. Sites and preliminary data from November and January sampling runs are included in the Presentation folder.

Intensive Water Sampling Discussion. The group discussed the need for a more intensive water sampling effort in the Waynesboro area in an effort to more specifically pinpoint the area(s) where mercury levels show rapid increases with distance downstream. It is hoped that such an effort may lead to the discovery of an active source of mercury, if one exists. The area between Waynesboro's Second Street bridge and the bridge at Hopeman Parkway (approximately 1.5 river miles) was suggested as a target area, based on data from the November and January clean metals sampling runs. These data show a marked increase in mercury levels in this reach of the South River. Ted Turner suggested a "sweep," consisting of clean metals water column samples collected along right and left banks every 100 yards through this 1.5-mile stretch of river. Such an effort would require nearly 50 samples, and would be a major undertaking in terms of field crews, lab analyses, etc., with no assurance that it would clearly answer the desired information. Before proceeding with this sampling effort, the group discussed several other potential areas of focus, designed to address or rule out several potential mercury sources in this stretch of river, with the suggestion that these areas be explored prior to initiating an extensive sampling effort. In the meantime, Ted Turner will assemble an outline for an intensive water sampling effort prior

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to the next meeting in order to quantify the resources, logistics, and cost of such an effort. Areas to be addressed before proceeding with intensive river sampling are listed below.

- Former Waynesboro landfill. There is an inactive landfill in Waynesboro, located near the reach of the South River where mercury values in the water column appear to be increasing. This site is east of Route 340, but between the Second Street and Hopeman Parkway areas. During the landfill's active life, DuPont routinely hauled waste to this facility. No records of this waste are available. Dick Jensen and Ted Turner have made a reconnaissance visit to the site on February 4, 2002, and noted the presence of a wetland area at the toe of the landfill. They also observed a dry streambed that carries surface runoff from this area to the South River between the Second Street and Hopeman Parkway bridges. Suggestions for further evaluation were made by the science team, including soils sampling in the wetland area and streambed and a review of any available groundwater data in the area near the landfill. Mike Liberati volunteered to head a task team to look at the landfill issue. Brenda Kennel volunteered to contact Waynesboro officials regarding access to the landfill property.
- Karst Geology under DuPont site. At the December 2001 Science Team Meeting, Mike Sherrier presented the results of an environmental study of the DuPont plant site. A karst area under a portion of the DuPont site was discussed, and it was unclear whether this groundwater formation might be intercepting and transporting mercury offsite. It is plausible that groundwater from this formation may enter the South River at some point downstream of the DuPont property. Mike Liberati agreed to look into this issue, enlisting the expertise of groundwater/geology specialists. Billy Van Wart volunteered to coordinate with DEG geology staff and put them in touch with Mike.
- Dredge Fill Area near Waynesboro STP. Larry Mohn noted that following the 1985 flood, extensive dredging and channelization of the South River occurred. A large volume of dredged material was used to fill and stabilize the left riverbank downstream of the Waynesboro Sewage Treatment Plant (STP). It is possible that this material contains a substantial amount of mercury, which could now be re-entering the river. Dick Jensen and Ted Turner agreed to look into the dredge spoil area, and Brenda Kennel agreed to contact Mr. Jax Bowman, retired Waynesboro Public Works Director, to see if he could provide information regarding history of the area.
- Overflight, Aerial Photos, Temperature Sensing, etc. Larry Mohn and Bob Luce were going to look into these issues to identify available archive photos, the options for future overflight photos, and the technologies to assist the group in identifying features not readily visible (example: identification of thermal differences where springs mingle with river waters).

Virginia Tech Fish Gut Study. Tammy Newcomb introduced her graduate student, Greg Murphy, who will be working on this project. Greg will be completing a draft of his thesis proposal by early March. He is assembling his graduate committee, with the members including Drs. Newcomb, Orth, and Cherry of Virginia Tech, along with Steve Reeser. Tammy suggested that a repeat sampling effort be conducted in the fall from some sites to evaluate whether gonadal uptake of mercury may affect muscle tissue levels in different seasons and reproductive states. She also pointed out that EPA's methods recommend that the skin not be lacerated in the

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portions of fish tissue used for fillte analysis purposes. Don Kain said he will check with the lab to see if they have any issues with analyzing fish whose heads and stomachs have been removed (Note: In a February 26 meeting with DCLS, lab staff indicated that this should not present any problems).

Those closely involved with the fish sampling will either get together in person or by conference call prior to the initial sampling event in order to work out logistics and field protocols. Ralph indicated that he would like to have the expert panel back for a 2-day meeting, possibly in September, and would like to have the meeting coincide with fish sampling, if possible.

Science Team Newsletter. Mike Liberati shared the progress on the Science Team newsletter (see Attachment 3). Task team members for this effort include Mike, Kathy Adams (technical writer for DuPont), Don Kain, Paul Bugas, Doug Larsen, Mike Newman, and Bob Luce. Each newsletter will be broken into 4 separate categories: "At a Glance," "From the Team," "Tech Corner," and "Did you Know?" Articles for the first issue (due in spring 2002) are being drafted by different members of the Science Team, with final polishing and editing by Kathy. Paul will assemble a draft mailing list for recipients. Comments on content, format, etc. are encouraged.

The group agreed that the newsletter will be considered a product of the South River Science Team, and will representing the "team" as an open group, and will note the groups continuing evolution. The newsletter will list a contact from each organization participating in the Science Team. Don Kain will inform DEQ's public affairs officer of the proposed newsletter and DEQ's role.

We will keep the newsletter as a standing agenda item for each meeting.

Mud Map Presentation. Dick Jensen presented the South River mud mapping report to the group, outlining detailed reconnaissance efforts to visually identify, describe, and map features of the river and adjacent floodplain. Areas of particular interest included fine-grained depositional areas (mud and muck), wetlands, tributaries, outfalls, islands, braided channels, etc. Dick also provided a demonstration of the interactive CD version of the report, which uses web browser technology to allow the user to view all maps, photos, and comments. The report will be finalized soon and distributed to Science Team members.

Waynesboro Former Landfill Investigation. Dick provided a brief update on a reconnaissance visit to the former (closed) Waynesboro landfill. Apparently large amounts of waste material from the Waynesboro DuPont plant were transported to the landfill during its active life, although quantities and nature of the materials were not recorded. Based on the reconnaissance visit, Dick reported the presence of a wetland/boggy area at the downhill toe of the landfill, with the potential for surface runoff to reach the South River. The landfill site is in the north end of Waynesboro, east of Route 340. Drainage from this area would reach the South River approximately 1-2 miles downstream of the DuPont plant..

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Floodplain Soils. Annette Guiseppi-Elie led a discussion on floodplain soil issues. An outline of her presentation is included in the Presentation folder. Annette provided a chronology of floodplain sampling and reports and a graphic display of mercury concentrations at different river miles. The highest levels (based on 1980 sampling) occurred within 10 miles of the DuPont plant. The discussion also included floodplain livestock uptake results (Dept. of Agriculture) and results of an ecological floodplain study completed by James Madison University. Annette also shared information from USEPA's Biosolids "503" Rule, which indicated that mercury uptake in plants from sewage sludge was negligible.

Mike Newman commented that mercury associated with floodplain soils would generally be expected to remain in place; however, with data indicating that greater than 90% of the mercury in the South River system is in the floodplain, the group agreed that more floodplain investigation is appropriate.

- Dick Jensen will acquire 100 and 500-year floodplain maps and overlay them with street and topo maps to provide a better understanding of potential risk areas, including residences, gardens, animal feed lots, etc. He will follow up with "ground-truthing" to confirm visually and anecdotally the areas where floodwaters have risen
- Annette will revisit the James Madison University studies. She will also continue reviewing literature on mercury uptake in plants and attempt to contact experts in this area.

Working Hypotheses. Ralph Stahl shared a list of working hypotheses and led the discussion on this topic. The handout is included as Attachment 4. Questions about water quality changes (which may alter mercury's impact to the environment and the biota) were discussed. Changes in water chemistry have the potential to change the reactivity and fate of mercury. Constituents which may influence mercury's behavior include selenium (binds mercury), sulfate, pH, and nutrients. For the specific projects underway, we should be sure to have a corresponding hypotheses in order to clearly define objectives and retain focus. Any comments on the hypotheses should be directed to Ralph, and he will make changes, as necessary.

John Rudd Seminar at DuPont. Ralph Stahl announced that Dr. John Rudd, a renowned mercury researcher affiliated with the Experimental Lakes Area in Canada, will be presenting a seminar and joining DuPont staff in a discussion of mercury in Wilmington, DE on March 4. Those who are interested in attending may do so. A telephone link with the DuPont Waynesboro plant will also be available to interested parties.

Action Item Summary.

- Ted Turner will assemble an outline for an intensive water sampling effort prior to the next meeting.
- Mike Liberati volunteered to head a task team to look at the landfill issue. Brenda Kennel volunteered to contact Waynesboro officials regarding access to the landfill property.

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- Mike Liberati agreed to look into the karst geology issue, enlisting the expertise of groundwater/geology specialists. Billy Van Wart volunteered to coordinate with DEQ geology staff and put them in touch with Mike.
- Dick Jensen and Ted Turner agreed to look into the dredge spoil area downstream of the Waynesboro STP along the left (west) bank, and Brenda Kennell agreed to contact Mr. Jax Bowman, retired Waynesboro Public Works Director, to see if he could provide information regarding history of the area.
- Larry Mohn and Bob Luce were going to look into aerial photo issues, both in terms of options for future flights (Larry) and existing photos using a variety of sensing technologies (Larry and Bob).
- Dick Jensen will acquire 100 and 500-year floodplain maps and overlay them with street and topo maps, followed at some point by "ground-truthing."
- Annette Guiseppi-Elie will revisit the James Madison University studies. She will also continue reviewing literature on mercury uptake in plants and attempt to contact experts in this area.
- Following receipt of comments and new information, Ralph Stahl will revise the working hypotheses.

Next Meeting. The next meeting will be at the Harrisonburg DEQ office at 9:00 am on April 23.

Anticipated agenda items include:

- Newsletter update and future topics
- Summary of Dr. Rudd's seminar
- Action item updates

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Attachment 1. List of Attendees

**SOUTH RIVER
SCIENCE TEAM MEETING
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<u>Name</u>	<u>Organization</u>	<u>e-mail address</u>
Don Kain	DEQ	dgkain@deq.state.va.us
Bob Luce	FOSR	lucerw@erols.com
Mike Liberati	DuPont	michael.r.liberati@usa.dupont.com
Larry Mohn	VDGIF	lmohn@dgif.state.va.us
Paul Bugas	VDGIF	pbugas@dgif.state.va.us
Stephen Reeser	VDGIF	sreeser@dgif.state.va.us
Bill Jordan	VDH	wgjordan@vdh.state.va.us
Bill VanWart	DEQ	wjvanwart@deq.state.va.us
Ralph Stahl	DuPont	ralph.g.stahl-jr@usa.dupont.com
Brad Trumbo	DGIF	btrumbo@dgif.state.va.us
Mike Newman	William & Mary-VIMS	newman@vims.edu
Tim LaFountain	VDH	tlafountain@vdh.state.va.us
Kelly Vanover	VDH	Kvanover@vdh.state.va.us
Dick Jensen	DuPont	richard.h.jensen@usa.dupont.com
Annette Guiseppi-Elie	DuPont	annette.guiseppi-elie@usa.dupont.com
Ted Turner	DEQ	rtturner@deq.state.va.us
Brenda Kennell	DuPont	brenda.l.kennell@usa.dupont.com
Greg Murphy	Virginia Tech	gmurphy@vt.edu
Tammy Newcomb	Virginia Tech	newcombt@vt.edu

Attachment 2. Proposed 2002 Fish Sampling (Bill Van Wart)

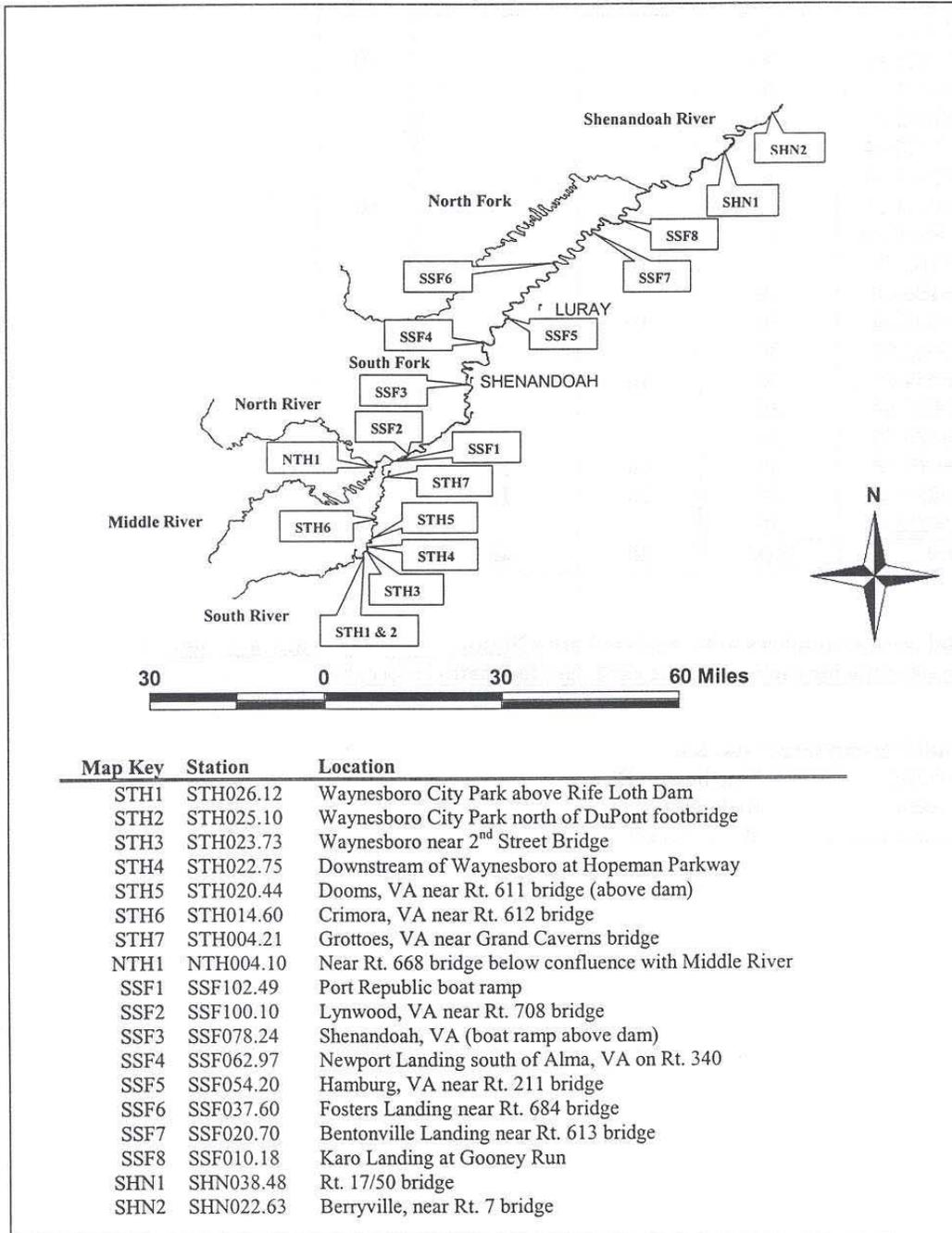


Figure 1. Sampling Locations

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Attachment 2 (continued). Proposed 2002 Fish Sampling
Table B1.1 – Sampling sites and collection goals.

Station	Trophic Groups	Channel Catfish	Largemouth Bass	Trout
STH026.12	30			
STH025.10	30			10
STH023.73	30			
STH022.75	30			
STH020.44	30			
STH014.60	30			
STH004.21	30			10
NTH004.10	30			
SSF102.49		10		
SSF100.10	30			
SSF078.24	30	10	10	
SSF062.97	30			
SSF054.20	30	10	10	
SSF037.60	30			
SSF020.70	30			
SSF010.18	30	10	10	
SHN038.48	30	10	10	
SHN022.63	30			
Total	510	50	40	20

Total sample numbers to be analyzed are 620 samples for total mercury, and 62 samples (one for each species at each site) for methyl mercury.

Trophic group target species:

Predators Smallmouth Bass
Foragers Redbreast Sunfish
Bottom Feeders White Sucker

Attachment 3. Newsletter Slide (Mike Liberati)



- Task Team - Mike Liberati, Don Kain, Paul Bugas, Bob Luce, Mike Newman, Doug Larsen, Kathy Adams
- Biannual (May/Nov) publication representing the Science Team and all organizations involved
- Layout and content for first issue proposed
- Need ideas and contributions for articles
- Mailing list is being developed

Attachment 4. Working Hypotheses (Ralph Stahl)

Working Hypotheses (WH) Development – South River Science Team

Statement of the problem:

Mercury concentrations in fish tissue in the South River appear not to have declined and in some cases appear to have increased, over the last 20 years.

Some potential hypotheses to explain these observations are listed below:

WH 1: On-going sources of mercury input to the South River exist and have prevented the decline of mercury concentrations in fish tissue. The potential sources for existing inputs to the river can be separated into 1) existing inputs potentially derived from historical releases, and 2) existing inputs based on current releases.

Potential pathways under 1) include: groundwater
sediments
floodplain soils
illegal dumping

Potential pathways under 2) include: groundwater
atmospheric deposition
point source discharges
non-point source discharges
illegal dumping.

WH 2: Water quality conditions (e.g., sulfate, chloride additions) have changed in the river over the last 20 years in a manner that favors the formation of methyl mercury and this has resulted in increases in mercury concentrations in fish.

WH 3: Observed changes in fish tissue mercury concentrations result from changes in the dietary preferences of important fish species in the river during the last 20 years.

WH 4: Wetland areas in the South River watershed have increased during the last 20 years and are contributing larger amounts of MeHg to the surface water.

WH 5: Clearing of forested areas of the South River watershed over the last 20 years has altered the availability of Hg from water shed soils in these areas and resulted in increased inputs of MeHg to the surface water

WH 6: The observed changes in fish tissue mercury levels over the last 20 years are a result of sampling artifacts and variability, e.g., changes in tissues sampled and emthod of collecting tissue, changes in analytical methods used to analyze tissues, and changes in analytical laboratories conducting the analyses.