

**Agenda**  
**South River Science Team**  
**April 14, 2004**

DEQ Office  
Harrisonburg, VA

Time	Topic	Presenter
9:00	Welcome, introductions	Don Kain
9:15	Outreach <ul style="list-style-type: none"> <li>- General</li> <li>- Signs, PSAs, multilingual issues</li> <li>- Sign Numbers &amp; Locations</li> <li>- Newsletter</li> <li>- Manuscript / SETAC abstracts</li> </ul>	<ul style="list-style-type: none"> <li>- Rick Straitman</li> <li>- Paul Bugas / Chris Nye</li> <li>- Ralph Stahl / Don Kain</li> <li>- Mike Liberati</li> <li>- Ralph Stahl</li> </ul>
9:45	Fish Tissue issues (trout, 2005 plan)	Ralph Stahl / Don Kain
10:00	DuPont Stormwater Update	Mike Sherrier
10:30	Floodplain Sampling	Annette Guiseppi-Elie
11:00	Shake & Bake	Erin Mack Rob Mason (by phone)
11:30	“Real Time” surveys with Lumex	Ralph Turner (by phone) Dick Jensen
12:15	Working Lunch – Shenandoah Water Window	Tom Benzing
12:45	Clam Study Updates	Tom Benzing Doug Graber-Neufeld
1:15	Modeling (30 minutes requested)	Nancy Grosso
1:45	South River Geomorphology (1 hr requested)	Jim Pizzuto
2:30	South River TMDL (30 minutes requested)	Charles Martin, DEQ USGS Staff
3:00	Summary Discussions <ul style="list-style-type: none"> <li>- Hypotheses</li> <li>- Where are we?</li> <li>- Where are we going?</li> </ul>	Ralph / Don
	Next Meeting	Ralph / Don

## **Meeting Summary:**

### **Welcome and introductions - Don Kain.**

- Attendees are listed below in Attachment 1, page 10. Attendees by phone included Betty Ann Quinn, Dave Friedman, and Joel Henesy from EPA; Ralph Turner, Bob Mason, Rick Straightman
- Mention of Bonnie Nauman's article in the Staunton Daily News Leader
- Mike Liberati's editorial response was printed later.
- Comments on the article were generally favorable and felt it was a positive report of the river and the SRST. Some concern was expressed over minor inaccuracies

### **Outreach; General. Rick Straightman**

- Requested any remarks/comments/suggestions from SRST members regarding outreach efforts.

### **Signs, PSAs, Multilingual Issues. Paul Bugas/Chris Nye**

- @ Shenandoah State Park, a bilingual employee translated our fish consumption advisory sign into Spanish
- Wasti and Gutshall working on getting signs out for posting
- Chris Nye got some announcements out in Spanish; broadcast on WXJM weekend Spanish radio show. Need to quantify how often the message gets out
- Chris suggested getting a poster/presentation that can be set up in Hispanic markets, etc.
- Suggestion was made to post signs on bridges, since there are limits to where signs can be placed along the water. VDOT would need to be contacted to get permission for this.
- T. Turner asked about materials for signs that wouldn't be so brittle in winter (many signs crack and fall off or become illegible); Paul Bugas suggested that Tyvec could be used, and that they use it for posting stocked/special regulations waters.
- Suggestions that we post in tackle supply stores, Wal Marts, etc.
- Health Dept. has PR folks who could assist in expanding outreach
- Don K. and Ralph S. to set up conference call in May to discuss above issues. Call will include DuPont, DEQ, VDH, and DGIF.

### **Outreach; Newsletter. Mike Liberati**

- Spring newsletter is "in the mail" as of the week of April 7
- Sent to about 1000 addresses
- Planning next issue; will tag folks @ next meeting for suggestions
- Ralph S.- will have Ralph Turner discuss Hg at ppttrillion level, implications of such concentrations in the environment
- Someone will probably address why fish levels haven't decreased as originally predicted by this time
- Considering an article on Chris Nye's efforts in Spanish speaking outreach

### **Outreach; Manuscript/SETAC abstracts. Ralph Stahl**

- Ralph pointed out that there's still room for more editors/contributors ☺
- Manuscript more of a history of the issue since Hg discovered in excavations at DuPont in '77.
- Some SRST members will be attending the SETAC World Congress in Portland Or. in May 2005; Greg Murphy to present (abstract?); probably other Sci. Team members as well
- Paul Bugas passed out events notices for Riverfest flyfishing festival; Tom Benzing will make a presentation there
- Waynesboro newspaper publishes articles on river events, plans for greenway, improve fish habitat, etc.
- There has been some talk about improving trout habitat and water quality by increasing the flow contribution from Baker Spring to the stream. One concern expressed was trout may have a greater likelihood of surviving in the river long enough to accumulate significant concentrations of Hg
- Erin Mac will print off DuPont's Powerpoint presentation to display at Riverfest; Paul Bugas will set it up.
- Flood Control; Waynesboro considering flood barriers. May investigate using inflatable levees

### **Fish Tissue Issues (trout 2005 plan). Ralph Stahl, Don Kain**

- Would like to find out if fish can carry over through summer, if they find a cool spring upwelling to hang out in; those sites may not occur near enough to our electroshocking sites for us to sample them.
- Bill Van Wart observed that we've never found high mercury values in trout (but we might not have been in areas where they can carry over)
- Don K. commented that likelihood of someone catching and eating enough of these "survivors" to be significant, is not likely
- Will ask Paul B. if there are any such likely "cold" spots in the Waynesboro reach.
- Don K., Ralph S., and Paul B. will arrange a conf. call to discuss/set up 2005 trout sampling plan, which may include a tag-recapture study to evaluate mercury uptake in individual fish that remain in the river for more than a single stocking season.

### **DuPont Stormwater Study Update. Mike Sherrier**

- In the process of getting automated samplers coupled to flowmeters
- ISCO samplers will still need to have someone press the "go" button when an acceptable storm event is imminent
- Haven't begun sampling yet
- Hope to have equipment installed and ready within 1 month; by next mtg. may have more baseflow, maybe some stormwater sampling completed
- Due to sampling constraints, have eliminated site 008C from the original sampling plan.
- Using method 1631, 0.5 ppt D.L., total and dissolved Hg, TSS

### **Floodplain Sampling. Annette Guiseppe-Elie**

- See Presentation folder for proposed sampling plan
- observations to date at Forestry Center in Crimora reveal that soil concentrations of Hg fall to baseline levels at >100m from the river banks at this site.
- Don't plan on sampling at Waynesboro public works shop, since soils are too highly disturbed to provide interpretable data
- Dick Jensen would like study to investigate crumbling river banks, to test for potential "layer cake" input of Hg into the stream
- Plan is to sample down about 18" in the floodplain, which Mike Sherrier believes will capture all Hg deposited within the last 80 years.
- Jack Eggleston from USGS asked if there had been any soil dating; answered that we'd done *sediment* dating at Dooms
- Jim Pizzuto pointed out that sediments from Dooms may not be able to be accurately dated, since they're influenced by the dam within 100 yds of where the samples were collected. Jim also pointed out that there will be some sites that will have Hg deposits that are deeper than 1 meter. He also suggested that particle size analysis be performed on the samples since the analysis is inexpensive, but provides useful information as to how Hg is sequestered amongst particle classes.
- Jim said that you can predict where deep Hg might occur if you can recognize floodplain features; aerial photos would be useful for this.
- There was a suggestion that we might want to look at MeHg at some sites
- Annette asked Don to pursue getting permission from property owners, and to assure owners that sampling would only involve a hand auger and wouldn't disturb property to any extent

### **Shake and Bake. Rob Mason**

- Found relatively high [MeHg] in sediment
- Reservoirs can be up to 2% methylated
- Used Hg-free sand to "lift" sediment in blender column, to maximize suspension efficiency, but was able to suspend all sediment without disturbing the sand
- Rob pointed out that the difference in TSS at Dooms (between sediment with DOC added, and unadulterated sediment) is artificial, since they were processed in different batches
- During the experiment, they varied stirring rate to get even TSS (aiming for 50-100 mg/L)
- Found TSS returned to baseline w/in 24 hours.
- Tried to keep D.O. high, therefore left off lids. This resulted in evaporation. Added water to compensate
- No Hg data yet (other than initial concentrations)
- Used acetate and pyruvate to add DOC to sediment to stimulate any potential biotic activity

- Also discussed sending water samples to have MeHg analysis (ok'd 4 samples, total and dissolved Hg, once in spring, once in late summer/early fall).
- See Presentations folder for Rob's slides.

### **Real Time Surveys w/ Lumex. Ralph Turner**

- On previous trip, saw twice the Hg via Lumex reading at Crimora compared to Dooms
- On Mar. 5, 2004 didn't see significant difference via Lumex
- Earlier reading could have been affected by sunlight reducing species of Hg to elemental, confounding Lumex
- During Mar. 5 survey, got good correlation between Lumex and total Hg via method 1631
- Increase in dissolved Hg from Dooms to Crimora highly monotonic
- No apparent contributions from Tunnel and Mine Branches between Dooms and Crimora
- Ralph T. will be in town again May; suggest do pore water and sediment work using lumex in vicinity of DuPont plant, Constitution Park, some upstream sites; maybe another float from Constitution to Dooms (may use Ralph's boat)
- Try "guzzler" method at a few sites, w/ some state folk along for sampling
- Also try and get sub substrate "pore" water using device similar to well point, along w/ peristaltic pump
- Don K. recommended getting overlying water sample from any pore water or sediment water samples collected
- Also suggested sampling oxbow near Basic Park, maybe use Lumex? Could wade in from Basic Park
- See Presentations folder.

**UPDATE:** John Rudd will probably step down from SRST due to receiving another position to work on Penobscott, Maine project

### **Lunch: Shenandoah Water Window. Tom Benzing**

<http://purewaterforum.org/waterwindow/>

- Demonstrated GIS capabilities of site, landuse layers, water quality data, etc.
- Data provided by Friends of Shenandoah River
- Discussed possibility of using Waterwindow to display advisories, etc

### **Clam Study Updates. Doug Graber-Neufeld**

- Used "clean" transplants from behind Bridgewater College to determine uptake rate in *Corbicula*, used "locals" at Forestry Center as controls

- Used shell length to measure growth during study to address potential “dilution” factors; showed no evidence of growth so far but wet weight has changed “seem to have swelled” (weight more sensitive indicator of growth, since it increases as the cube of length)
- Clams exposed from Nov. 27 through Feb 8 have been analyzed; controls and “clean” both increased in tot. Hg during that time, but “clean increased at about 2x rate of controls up until Jan 4, but both decreased in tot. Hg at approximately the same rate after Jan 4. Will continue sampling remaining clams over time to observe temporal changes.
- Next phase of plan is to check hot-spots.
- human lymphocytes can demethylate Hg
- Ralph T. thinks clams will track water Hg very quickly
- Clams in cage stay up in water column
- Might want to try and simultaneously collect clams at sites when fish tissue is sampled in 2005 to compare results
- See Presentations folder.

#### **Clam Study Updates. Tom Benzing**

- Proposed 3 options: sample near DuPont, sample original Intensive stretch from 2<sup>nd</sup> St. past Basic Park, or do stretch in vicinity of Dooms
- Ralph Stahl suggests to do all proposed sites; Tom would need additional resources
- Joel Henesy suggested doing new sites to get new information, but the proposed sites have the highest Hg “activity” (high fish, water, and sediment concentrations)
- Tom is concerned w/ documented die-offs that tend to occur in the summer. That would constrain the experiment be performed in a shorter time, only time to do 1 option
- Consensus from SRST to start w/ Option A at the DuPont plant; leave them for 3 mos., then harvest (no time series to be taken)

#### **Hg Transport Modeling. Nancy Grosso**

- Ultimate goal is to develop model that would suggest methods to reduce Hg levels in fish tissue
- Fluvial Geomorphology linked w/ Numerical Hydrodynamic modeling
- Bob Luce believes there’s a need to ID form in which Hg is being transported (speciation)- this will probably be addressed in any model developed
- Ralph Turner- Hg transport mainly tied to sediment transport (this seems to be case from bimonthly clean Hg monitoring and TSS results)
- Jim Pizzuto would need to model mainly stream bed and banks, assuming floodplain interaction isn’t significant
- Nancy suggests that next step be to request a proposal from Hydroqual Inc. Proposal to identify processes that resulted in current Hg distribution and to identify gaps in data needed to develop models; simultaneously have geomorphologist engaged from “other perspective” (more theoretical?) to optimized data collection and evaluation

- See Presentations folder.

### **South River Geomorphology. Jim Pizzuto**

- Trees reduce erosion rates, therefore more trees would reduce any potential bank erosion Hg input to stream (relatively cheap mitigation, if banks are significant source of Hg to fish tissue)
- Current depositional rates very low
- Bed sediments are probably only in motion a few times/year (would this include subsurface fines, or would they be mobilized more often)
- One study showed ~ 10 % mud transport/year from interstitial space between cobbles
- See “Annual Water Column Sediment Budget for Silt and Clay; Future Work” slide in presentation – measurements needed to develop sediment related Hg budget “residence”
- First task is to map eroding banks, then look at historical aerial photographs
- Ralph T. suggested to look for FEMA x-sections from previous surveys
- Dick J. – sample where representative features exist (but need overall map to know where these features occur)
- Jim suspects that big flood events are relatively insignificant relative to Hg transport, when considering the duration of the event compared to the continuous erosion at normal flows (although we did see a lot transported during historic floods; deposition following Isabel)
- Ralph S. requested that Jim make a plan for a study for a two year time-line
- See Presentations folder.

### **South River TMDL. Charles Martin/ Mark Bennet**

- DEQ is required to do TMDL on all impaired waters (South River by 2010)
- South R. has both Hg and benthic impairments
- Backbone of previous TMDLs has been numerical models; for South R., would include rainfall, sediment transport (simply addressed); transformations; look at data we have and decide additional data required
- The South River was selected for the first Hg TMDL because it has the most available data
- TMDL developers will plan on periodically attending SRST meetings to update on TMDL progress; this will probably take 2-3 years
- Still need to develop/select models (WASP or NADP?)
- Nancy G. asked if controllable compartments are identified, would we still need a full blown model for TMDL?
- Tom B. asked if atmospheric deposition was included in data used for model development (for our system, atmospheric doesn't seem to be an issue, as indicated by both our upstream controls (above Rife-Lothe Dam, and watershed controls (North River).

- Mark may contact VRO/DEQ in future to request data, assistance in model development

### **Summary Discussions. Ralph Stahl, Don Kain**

- Ralph Turner still planning to do “guzzler/Lumex work in May? Date?
- Birds still a secondary priority for examination (addressing fish tissue issues will address potential bird issues; see Filling Data Gaps slide below)
- Focus is still to address processes that keep fish tissue elevated (see Oct. 2003 meeting “What We Think We Know” slide)
- Hope to use sediment sampling via the “Guzzler” to address the potential Hg globules issue and to standardize for consistency in particulate size and type
- In spite of recently discovered DuPont plant contribution of Hg through 001, fish tissue still higher downstream; data suggest that outfall 001 contribution is not sufficient to cause the significant fish tissue elevations observed (we see too great an effect too far downstream)
- See Presentations folder for Ralph’s “Working hypotheses” and “Filling in the Data Gaps” handouts.

### **Action Items:**

- 1) Sign issues- Language (new material) – Don Kain and Ralph Stahl to set up call (to include VDH and DGIF).
- 2) Trout issues – same as above. Call to be set up.
- 3) Ralph T. in May for guzzler/Lumex sampling (develop sediment sampling design)
- 4) Erin to get SRST poster to Paul B. for Riverfest in Waynesboro
- 5) Tom – fact sheet for Hg on Water Window
- 6) Tom and Doug to work on Clam Proposal
- 7) Jim Pizzuto to develop 2-year plan for geomorphological evaluation
- 8) Rob Mason to provide final Shake and Bake data by next meeting

**Next Meeting June 15, 2004**

# Attachment 1. List of Attendees

## SOUTH RIVER SCIENCE TEAM MEETING - Apr 14, 2004

Name	Organization	Phone No.	E-Mail Address
PAUL BUCKS	VVAIF	540 249-9361	pbucks@vvaif.state.va.us
Jack Eggleston	USGS	508-490-5105	jeggles@usgs.gov
Bob Luce	Friends of Shen. R.	540-869-3764	lucerb@shenvali.net
Greg Murphy	VA TECH	540-250-1314	gmurphy@vt.edu
Brenda Kennell	ENVISTA	640-946-1320	brenda.l.kennell@ENVISTA.COM
Ralph Stahl	DuPont	302 892 1369	ralph.g.stahl-jrc@dupont.usa.com
Bill Van Wart	DEQ	540-574-7561	bill.vanwart@deg.state.va.us
NANCY GROSSO	DuPONT	302-992-6783	nancy.r.grosso@usa.dupont.com
Allen Gutschall	VDH	540-332-7830	allen.gutschall@VDH.Virginia.gov
Bill Jordan	VDH	540-332-7830	Bill.A.M. <del>Ed</del> Jordan@Vdh.VIRGINIA.GOV
Doug Meyer	USGS	804-261-2634	dmeyer@usgs.gov
Ken Hyer	USGS	804-261-2636	Kenhyer@usgs.gov
Robert Brent	DEQ	540-574-7548	rbrent@deg.state.va.us
Sina Prielius			sina.prielius@web.de
Mark Bennett	USGS	804-261-2643	mr.bennet@usgs.gov
James Yoder	DEQ	540-427-6035	lyoder@james.yoder.com
Sally Vanover	VDH	540 722-2780	Kelly.Vanover@VDH.Virginia.gov
CHARLES MARTIN	DEQ	804-098 4422	CHMARTIN@DEQ.STATE.VA.US
Ward Staubitz	USGS	804-261-2639	staubitz@usgs.gov
Jutta Schneider	DEQ	804-698-4099	jschneider@deg.state.va.us
Annette Guiseppi-Elie	DuPont	804,383,4584	annette.guiseppi-elie@usa.dupont.com
EMIL MACK	DuPont	302-366-6705	EMILMACK@EMIL.MACK@USA.DUPONT.COM
Mike Liberati	DuPont	302 892 7421	michael.r.liberati@usa.dupont.com
MIKE SHERRIER	URS	302 892-1168	Michael.p.sherrier@usa.dupont.com
DICK JENSEN	DuPont	302 517 6286	JENSEN@DECAWATE.NET
Tim PIZZATO	Geology, U. of Delaware	302-831-2710	pizzato@udel.edu
Tom TURNER	DEQ	(540) 574-7858	rtturner@deg.state.va.us
Tom BENZING	JMU	(540) 568-2794	benzintr@jmu.edu
DOUG GRABER-NEUFELD	EMU	(540) 432-4400	neufeld@emu.edu