

SUBJECT: *Proposed Action Plan for the Geographical Delineation of Fish Tissue and Sediment PCB Contamination, Roanoke River - Smith Mountain Lake Watershed, Franklin - Bedford Counties, VA*

TO: Bob Burnley, Director

FROM: Larry Lawson, Director Division of Water Program Coordination

DATE: February 6, 2004

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A: Objective:

The intent of this project is to determine the geographical extent and magnitude of the contamination of fish by polychlorinated biphenyls (PCBs) in the Roanoke River - Smith Mountain Lake watershed in Franklin - Bedford Counties, VA. The Virginia Department of Health (VDH) issued a PCB fish consumption advisory in an October 29, 2003 press release based on fish tissue data collected by the Virginia Department of Environmental Quality (DEQ) in 2002 from the Smith Mountain Lake site near Hardy Ford. The press release recommended eating no more than one meal per month of flathead catfish taken from the problem area. Additionally, the VDH at a meeting on September 24, 2003 requested that DEQ collect data on the important striped bass to aid in its evaluation of the level of PCBs in this economic and recreation resource of the lake. The focus of this project is to provide the VDH additional data so that they have the necessary information to determine the magnitude and extent of PCB contamination of fish, and to decide the need for a comprehensive consumption advisory of the entire lake watershed. The suggested sampling will encompass the Roanoke River - Smith Mountain Lake Watershed, from just downstream of Niagara Dam to the Smith

Mountain Lake Dam. The river stretch is approximately 35 miles. Sediment samples collected may help bracket the boundary limits of PCB contamination within the study area.

B: Justification:

First, the concentrations of PCBs in individual samples of edible fillets of flathead catfish tissues collected in 2002 by the DEQ exceeded the VDH level of concern of 600 parts per billion (ppb) or higher for PCBs, a specific toxic contaminant. Three flathead catfish samples from Roanoke River - Smith Mountain Lake Watershed near the Hardy Ford crossing had PCB levels of 1266, 1445, and 1116 ppb respectively. PCBs were also reported in striped bass samples from Smith Mountain Lake sampling station near Hales Ford in 2002 at levels between 64 and 219 ppb and in 1998 between 58 and 198 ppb.

Second, the concentrations of PCBs in these 2002 flathead catfish tissues and 2002 and 1998 striped bass samples assessed using DEQ risk assessment techniques for PCBs as carcinogens exceeded the DEQ risk-based Screening Value (SV) of 54 ppb. Although PCBs are only suspected carcinogens, the PCBs concentrations in the flathead catfish tissues also exceeded the SV for non-carcinogens of 220 ppb. The SVs are from Table 6a of the Water Quality Assessment Guidance Manual for Y2002 305(b) Water Quality Report and 303(d) Impaired Waters List (DEQ, July 15, 2002).

The segments were listed impaired for fish consumption use in the DEQ 2002 303(d) Impaired waters list (Segment ID VAW-L12L_ROA04A02 and Segment ID VAW-L12L_ROA03A02) due to PCBs in tissues of multiple species at Roanoke River - Smith Mountain Lake watershed in 1999 and 1998 respectively.

1999 fish collections near Hardy Ford at 4AROA196.05-TL revealed PCBs in excess of the DEQ screening value of 54 parts per billion (ppb) in tissue from four species: largemouth bass - 73.7, carp - 124, gizzard shad- 386, and redhorse sucker - 89.9 ppb. The 378 acres segment is listed partially supporting for fish consumption use in the 2002 303(d) Impaired waters list (Segment ID VAW-L12L_ROA04A02) due to PCBs.

1998 fish collections in Smith Mountain Lake at 4AROA175.63-TL revealed PCBs in excess of the DEQ screening value of 54 parts per billion (ppb) in tissue from four striped bass fish tissue at levels of 58.0, 84.7, 107.0 and 198.0 ppb. The 2871 acres segment is listed partially supporting for fish consumption use in the 2002 303(d) Impaired waters list (Segment ID VAW-L12L_ROA03A02) due to PCBs.

As a result of the above flathead catfish tissue concentrations exceeding VDH's level of concern of 600 ppb for PCBs, the VDH recommended "additional sampling of flathead catfish for this station and other nearby stations in order to fully evaluate the extent of contamination and its potential impact on human health". This suggests a potential threat to human health upon which the Director may determine the need for a source assessment.

Therefore, this project is consistent with the Department's Toxic Contamination Source Assessment Policy (January, 2000) which describes when and how to conduct source assessments for toxic contaminants using the Virginia Environmental Emergency Response Fund (VEERF). The circumstances above represent triggers listed in that document, which indicates the need for toxic contaminants source assessment.

C: Project Structure:

The DEQ's Central Office Fish Tissue and Sediment Monitoring Program and Virginia Department of Game and Inland Fisheries (DGIF) staff will collect fish tissue samples in the fall and winter of 2003. Additional fish tissue and sediment samples will be collected at selected sites during the spring and summer of 2004 within the Smith Mountain Lake watershed. The tentative list of potential sites may be adjusted based on accessibility, river condition, weather, etc., (see Table 1 and Figure 1). The Virginia Institute of Marine Sciences (VIMS) will perform biota and sediment sample analyses once VEERF funding has been approved. Funds for additional sampling may be requested in the future, pending the 2004 sample results.

Table 1: Potential 2003-2004 Roanoke River - Smith Mountain Lake Watershed follow up sites

DEQ site #	Stream name/location/description	Latitude	Longitude
2003 DGIF gill netting Striped Bass			
	SML-Blackwater River near Scruggs # 7		
	SML-Blackwater River near 4-H camp		
	SML near Hales Ford bridge		
	SML near Smith Mountain Lake State Park		
2004 sediment sites			
site #1	Roanoke River upstream Back Creek	N37° 15.059'	W79° 51.805'
site #2	Roanoke River downstream Back Creek	N37° 13.219'	W79° 48.641'
site #3	Roanoke River-SML near Falling Creek	N37° 13.992'	W79° 46.919'
site #4	SML-Lynville Creek near Rt. 676	N37° 11.754'	W79° 46.968'
site #5	SML-Beaverdam Creek near Rt. xxxx	N37° 12.848'	W79° 44.986'
site #6	SML-Indian Creek near Rt. 677	N37° 08.731'	W79° 44.097'
site #7	SML-Gills Creek near Rt. 668	N37° 04.786'	W79° 42.123'
site #8	SML-Bull Run near Rt. 647	N36° 59.778'	W79° 39.481'
site #9	SML-LittlBull Run near Rt. 1122	N37° 00.012'	W79° 37.055'
site #10	SML-Bettys Creek near Bettys Creek Dr.	N37° 07.137'	W79° 40.926'
site #11	SML-Beckys Creek near Beckys Creek Dr.	N37° 06.211'	W79° 40.789'
site #12	SML-Hales Creek near Rt. xxxx	N37° 09.809'	W79° 39.746'
site #13	SML-Stony Creek near Rt. 842	N37° 10.379'	W79° 41.418'

D: Safety Requirements:

General safety requirements will be followed as stated in the DEQ's Quality Assurance/Quality Control Project Plan for the Fish Tissue and Sediment Monitoring Program (August, 1998).

E: QA/QC for Field Sampling and Laboratory Analyses:

The DEQ's central office staff in standards and biological programs will perform all field sampling covered by this plan. All field quality control samples will be collected in accordance with the Agency's Quality Assurance/Quality Control Project Plan For The Fish Tissue and Sediment Monitoring Program (August, 1998). Split and replicate samples will be analyzed at a frequency of 10%. All samples collected under this plan will be analyzed by VIMS.

F: Project Scope:

The projected study schedule follows:

January 2004 – Approval of Proposed Project Plan for VEERF funding by Agency Director.

February 2004 – Draft Project Plan incorporated into the 2004 DEQ Fish Tissue and Sediment Monitoring Plan.

Summer 2004 – Collect Fish and Sediment samples (Approximately One-Week Sampling Event)

January – February 2005 – Deliver samples to VIMS

June 2005 – Receive sample results and report to VDH

June – December 2005 – Evaluate results. Identify contaminated stations sampled in 2004. Consultation with VDH. Post data on the DEQ website. Request VEERF funding and conduct further sampling as deemed necessary and dictated by findings.

G: Responsibility for Specific Study Plan Tasks:

Project Team:

Jean Gregory – WQS&BP manager fish tissue and sediment collection. Facilitates communication and coordination among VDH, and DEQ Central Office and Regional Office Staff.

Alex Barron – WQS&BP manager fish tissue and sediment collection, data analysis, and report preparation.

Rick Browder – Sample collection planning and logistics, field collections, data analysis, data management, and report preparation.

Gabriel Darkwah – WQS&BP fish tissue and sediment lab liaison, data analysis, and data management, QA/QC, website production, and report preparation.

Dr. Rob Hale – VIMS Lab Director, data QA/QC, and primary contact for samples submitted to VIMS.

Bill Hayden – DEQ Public Affairs Director. Central Office point of contact for web-targeted information. Central Office contact for reporters and press releases.

H: Costs of Implementation:

The Virginia Legislature has authorized use of the Virginia Environmental Emergency Response Fund (VEERF) for conducting the assessments described here in accordance with DEQ's Toxics Contamination Source Assessment Policy (VEERF Policy Statement 2-2001, effective 9/11/2000). Costs budgeted include sampling and analysis for samples (see Table 2).

Total Cost for sampling November, 2003 – December, 2005: \$ 50,200.00

- **Fish Tissue and Sediment Analysis**

WQS&BP estimates \$ 48,600.00 will be needed to analyze 40 flathead catfish tissue samples at \$510 plus 40 striped bass tissue samples at \$510 and 12 sediment samples at \$520 including QA/QC samples in order to conduct this study as requested by VDH.

- **Incidentals**

A commitment of \$1600.00 for equipment, lodging, meals, and miscellaneous incidental travel costs for 4 member field crew and approximately four day sampling event.

Any change in the scope of work to include special contracted services or expanded sampling will require additional resources.

**Table 2: Itemized Budget for Roanoke River - Smith Mountain Lake Watershed
VEERF Project**

Sample Analysis: Flathead Catfish Fish Tissue Halogenated Organics, 40 samples @ \$510 each.	\$ 20,400
Sample Analysis: Striped Bass Fish Tissue Halogenated Organics, 40 samples @ \$510 each.	\$ 20,400
Sample Analysis: Sediment Halogenated Organics, 15 samples @ \$520 each.	\$ 7,800
Travel Costs: hotel, meals, equipment, and incidentals for 4 day sampling event with 4 field crew members.	\$ 1,600
Total	\$ 50,200

I: Products:

1. Maps with the following information
 - Monitoring locations and contaminant concentrations for fish tissue and sediments

2. Reports
 - Data to VDH
 - DEQ website and data to DEQ assessment staff
 - Plans and recommendations for further investigation

DEQ Director Approval: _____ Date: _____

Fig 1: tentative Smith Mt. Lake 2004 PCB follow up sites

