

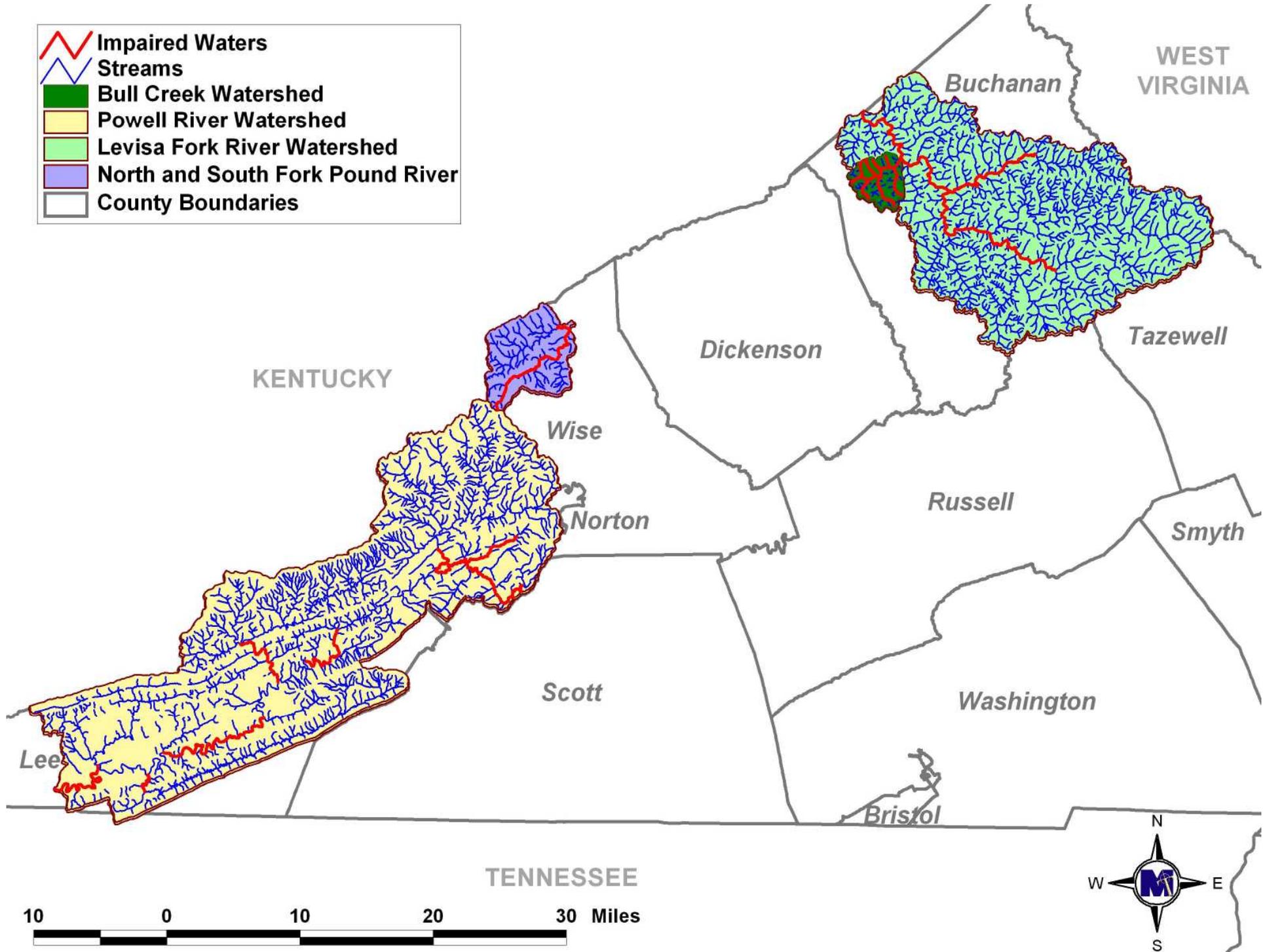


Phased TMDLs in Bull Creek, Levisa Fork, Pound River and Powell River

Public Meeting
October 24, 2013

Phased TMDLs

- Bull Creek
 - Sediment (TSS) and Total Dissolved Solids (TDS)
- Levisa Fork
 - TSS and PCBs
- Powell River
 - TSS
- Pound River
 - Lower North Fork Pound
 - TSS
 - South Fork Pound
 - TSS and TDS
 - Phillips Creek
 - TSS and TDS



Why are we here tonight?

- Phased TMDLs
 - Concern over the data available and the modeling results during TMDL development.
- Process
 - “Phase I” TMDLs submitted
 - Additional monitoring
 - Develop “Phase II” TMDL

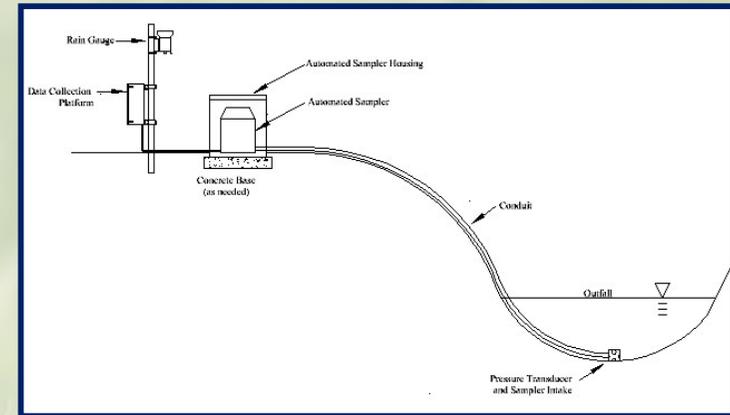
Issues of Concern

- What sediment loads are discharged from surface mine ponds during storm events?
- What is the annual contribution of TDS from the abandoned underground mine workings?
- How much do the existing straight pipes contribute to the stream's impaired aquatic life?
- Should PAH (naphthalene, 2-methyl naphthalene) be considered as a probable stressor?

Sediment from Surface Mine Ponds

(All 4 TMDLs)

- Automated samplers at pond outlets.
 - Rain gages
 - Stage (water level) measurement
- Sampling triggered by water level increase.
- 24 samples per event.
- Weir installed at one site.



TSS Monitoring Results

Data Source	Outfall 004 TSS (mg/L)	Outfall A TSS (mg/L)	Outfall B TSS (mg/L)
DMME Monitoring	8.4	8.5	19.8
Baseflow Average	6.4	4.2	6.3
Average Storm Max	28	319	44
Average Storm	9	60	22
Average Storm Max: Pre-Weir	15	75	24
Average Storm: Pre-Weir	6	20	12

TSS Conclusions

- Compromise between the traditional approach and proposed approach.
- Calculate TSS loads from permitted mining sites based on the permitted TSS level of 70 mg/L.
- Applies to existing load, and, if no reductions are needed, allocated load.

TDS Study Results

- Flows from abandoned mine works were 2.3 times higher than those used in the original Bull Creek model.
- Relationship between flow volumes/loads and hydrologic “footprint.”
- In-stream data from South Fork Pound supported additional load from abandoned mine works.

TDS Study Results

- Bull Creek abandoned mine works load increased by a factor of 2.3.
- Portion of “Groundwater Load” attributed to abandoned mine works in South Fork Pound (including Phillips Creek).
- Additional load in Phillips Creek distributed based on the hydrologic footprint relationship.

Phased TMDLs

- Bull Creek
 - TSS **Change**
 - TDS **Change**
- Levisa Fork
 - TSS **Change (Existing)**
 - PCB **No Change**
- Powell River
 - TSS **Change (Existing)**
 - PAH **Not Added**
- Pound River
 - Lower North Fork Pound
 - TSS **Change**
 - South Fork Pound
 - TSS **Change**
 - TDS **Change**
 - Phillips Creek
 - TSS **Change**
 - TDS **Change**

Bull Creek

- Sediment
 - ~43% reduction from non-regulated human-impacted lands, including channel erosion
- TDS
 - 100% reduction from AML, pre-law mine discharges, straight pipes, failing septic systems
 - ~23% reduction from background (groundwater)
 - 20% reduction from regulated mine discharges

Bull Creek Phased TMDL Changes

Phase I TMDL				
Parameter	WLA	LA	MOS	TMDL
TDS (kg/yr)	117,033	3,040,950	Implicit	3,157,983
TSS (t/yr)	4.62	2,451.20	303.88	2,759.70
Phase II TMDL				
Parameter	WLA	LA	MOS	TMDL
TDS (kg/yr)	40,687	2,840,285	Implicit	2,880,972
TSS (t/yr)	58.89*	4,135.15	466.40	4,660.44
* Includes a future growth load of 46.64 t/yr				

Levisa Fork, Garden Creek, and Slate Creek TMDLs

Slate Creek				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	31.46	1,738.14	197.77	1,967.37
Garden Creek				
Parameter	WLA	LA	MOS	TMDL
PCB (mg/yr)	319.10	632.61	50.09	1,0001.80
Levisa Fork				
Parameter	WLA	LA	MOS	TMDL
PCB (mg/yr)	5,009.30	3,421.12	443.71	8,874.14
TSS (t/yr)	729.66	16,817.78	1,949.76	19,497.20

Powell River TMDL

Powell River				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	1,657.11	55,877.26	6,392.74	63,927.11

Lower North Fork Pound

- Sediment
 - ~32% reduction from non-regulated human-impacted lands, including channel erosion

Lower North Fork Pound Phased TMDL Changes

Phase I TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	0.00	320.00	39.90	359.90
Phase II TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	10.89	968.30	108.86	1,088.05
* Includes a future growth load of 10.89 t/yr				

Phillips Creek

- Sediment
 - ~37% reduction from non-regulated human-impacted lands, including channel erosion
- TDS
 - Work in progress ...

Phillips Creek Phased TMDL Changes

Phase I TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	8.62	409.00	108.78	526.40
TDS (kg/yr)	75,818	129,712	Implicit	205,530
Phase II TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	39.53*	981.76	113.64	1,134.93
TDS (kg/yr)	Work in Progress ...			
* Includes a future growth load of 11.36 t/yr				

South Fork Pound

- Sediment
 - ~71% reduction from non-regulated human-impacted lands, including channel erosion
- TDS
 - Work in Progress.....

South Fork Pound Phased TMDL Changes

Phase I TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	15.00	3,012.90	593.20	3,621.10
TDS (kg/yr)	1,854,300	3,172,415	Implicit	5,026,715
Phase II TMDL				
Parameter	WLA	LA	MOS	TMDL
TSS (t/yr)	119.69*	4,832.88	550.64	5,503.21
TDS (kg/yr)	Work in Progress ...			
* Includes a future growth load of 55.03 t/yr				

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