

Water Quality Standards Quarterly Meeting

November 15, 2016

LAURA COOPER

ASSISTANT DIRECTOR DWWM, WATER QUALITY STANDARDS

LAURA.K.COOPER@WV.GOV



west virginia department of environmental protection



Agenda

Introductions – WQS Staff, Attendees

2016 Nutrient Criteria Development Plan

2016 Algae Monitoring Water Sampling

2017 Triennial Review Update

Agenda

Introductions – WQS Staff, Attendees

2016 Nutrient Criteria Development Plan

2016 Algae Monitoring Water Sampling

2017 Triennial Review Update

Agenda

Introductions – WQS Staff, Attendees

2016 Nutrient Criteria Development Plan

2016 Algae Monitoring Water Sampling – Jamie Peterson

2017 Triennial Review Update

2016 Nutrient/Algae Assessment Season Review



Streams assessed by WVDEP

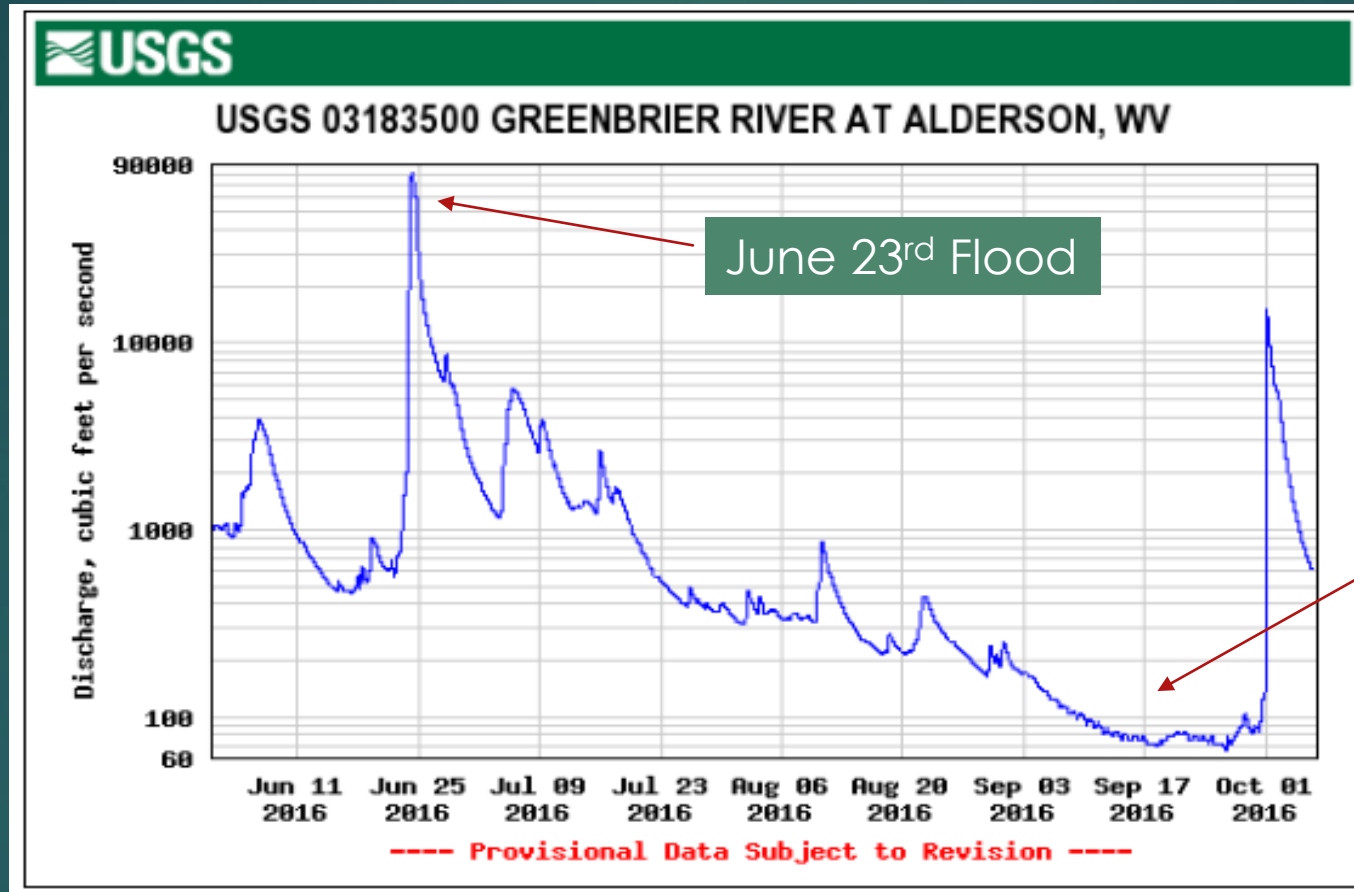
303(d) Listed-Impaired

- ▶ Greenbrier River ← (Sample/Longitudinals-2)
- ▶ Tygart Valley River ← (Sample/Longitudinals-2)
- ▶ South Branch of Potomac River (Sample/Longitudinals with ICPRB-2)
- ▶ Cacapon River ← (Sample/Longitudinals with ICPRB-1)

Not Listed

- ▶ Buckhannon River (Sample/Longitudinals-1)
- ▶ New River (Observation)
- ▶ Bluestone River (Observation)

Greenbrier River Flow



AGB-BC1 (Beaver Creek)

August 3rd

45.11%



AGB-FS (Fort Spring)

September 28th

47.01%



AGB-RR (Rockland Road)

September 28th

63.75%



AGB-RR (Rockland Road)

September 28th



AGB-R2 (Ronceverte)

September 22nd/28th

67.37%

*DO 4.48 (8/17/16) to 12.05 (9/28/16)



Greenbrier Longitudinal- Caldwell to Fort Spring (September 21st/22nd) >90% - Below Ronceverte



Greenbrier Longitudinal

Algal Mats

80-90%



Greenbrier Longitudinal Algal Mats



AGB-RR / Longitudinal

September 22nd

80-90%



Algae Pattern?

- ▶ Impairment at Coffman Hill (AGB-CH)

- ▶ 2014 - 30% (3X)
- ▶ 2015 - 41%
- ▶ 2016 - No (<1%)

- ▶ Impairment at Rockland Road (AGB-RR)

- ▶ 2014 - 61%
- ▶ 2015 - No (15%)
- ▶ 2016 - 63%

- ▶ Impairment at Fort Spring (AGB-FS)

- ▶ 2014 - No (10%)
- ▶ 2015 - No (3%)
- ▶ 2016 - 47%

- ▶ Impairment at Ronceverte (AGB-R2)

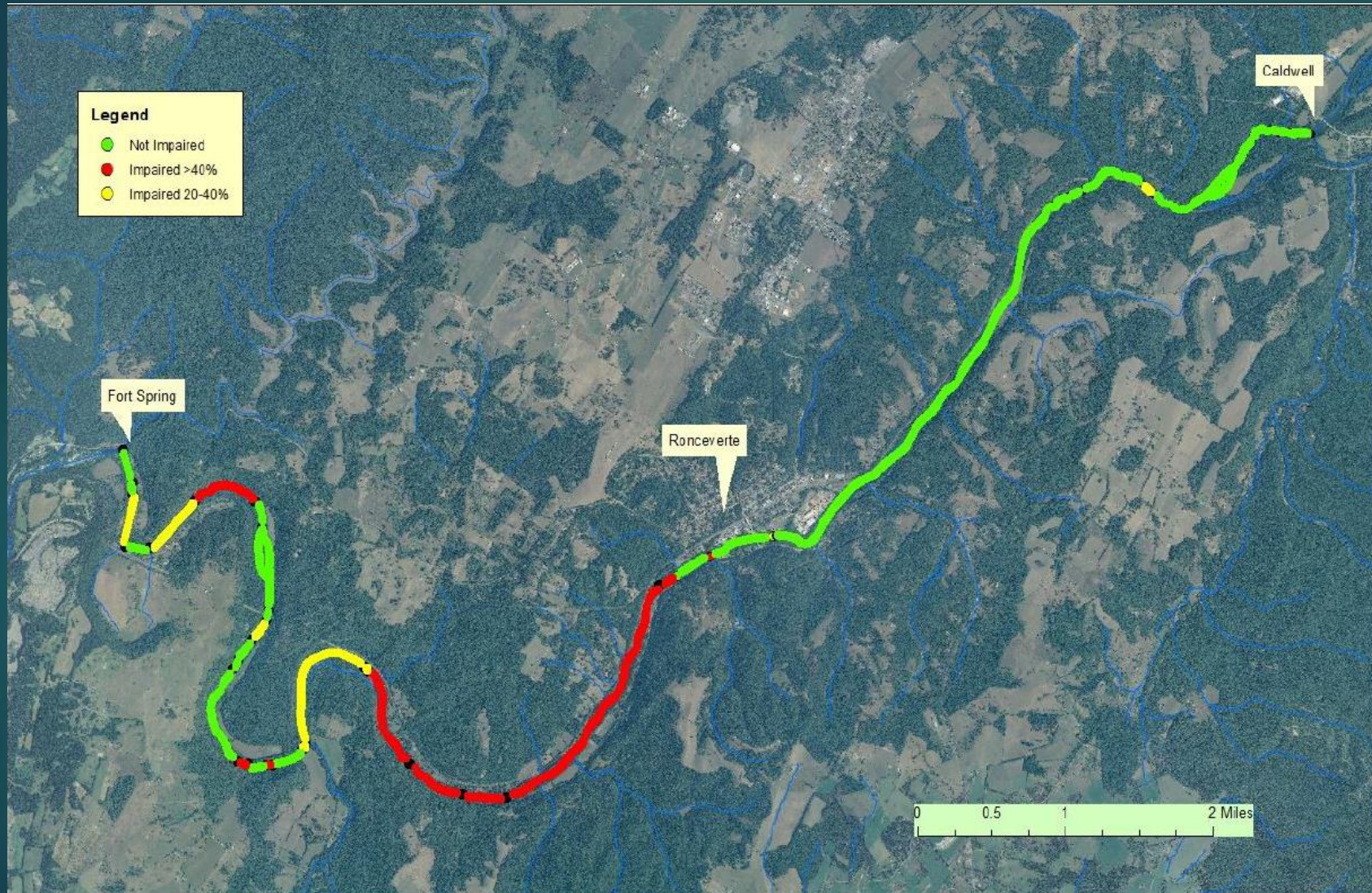
- ▶ 2014 - 44%
- ▶ 2015 - No (15%)
- ▶ 2016 - 67%

Greenbrier - 2016



Red-Impaired >40%
Yellow-Impaired 20-40%

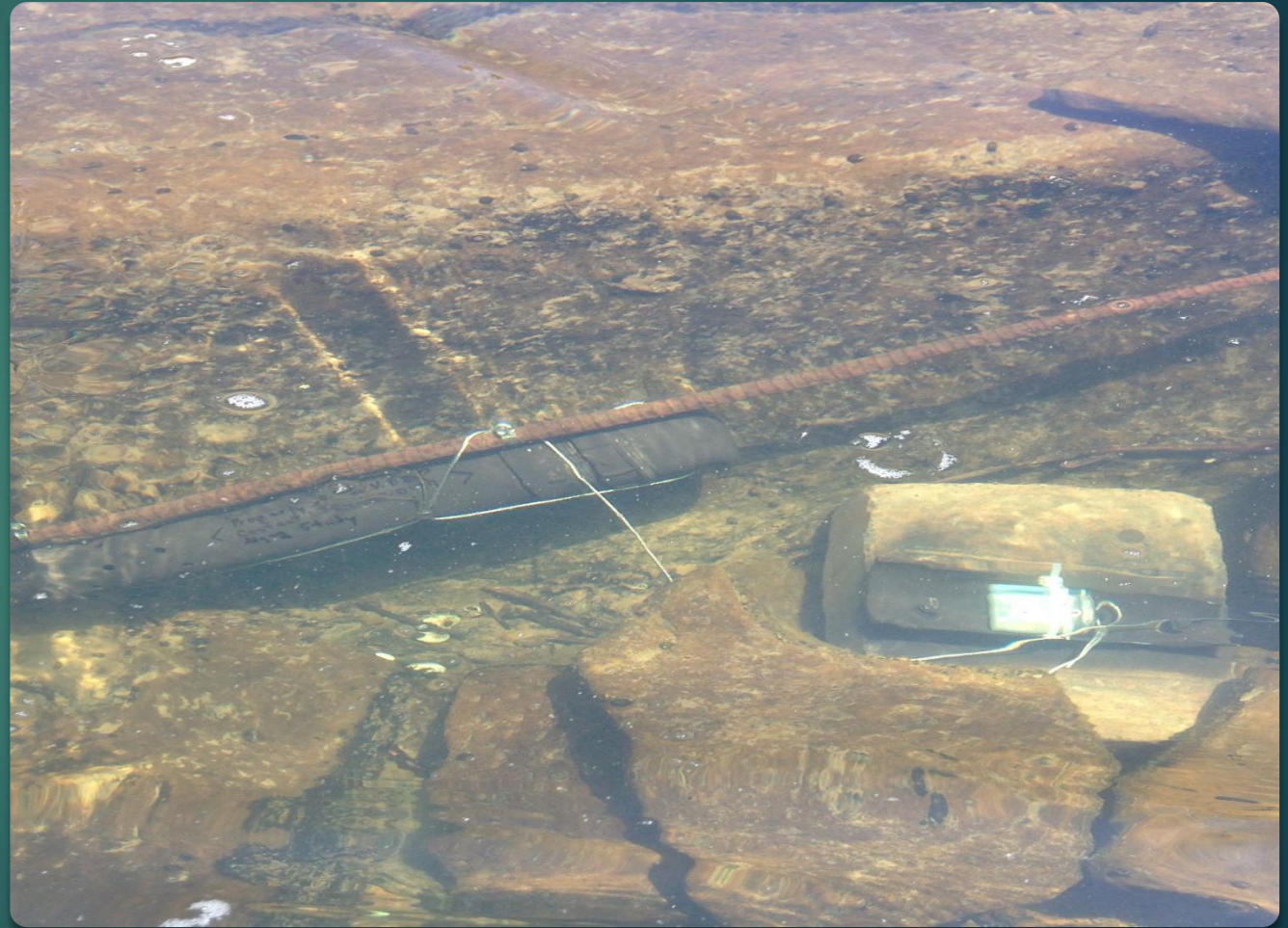
Greenbrier - 2014



Howard Creek Nutrient Averages

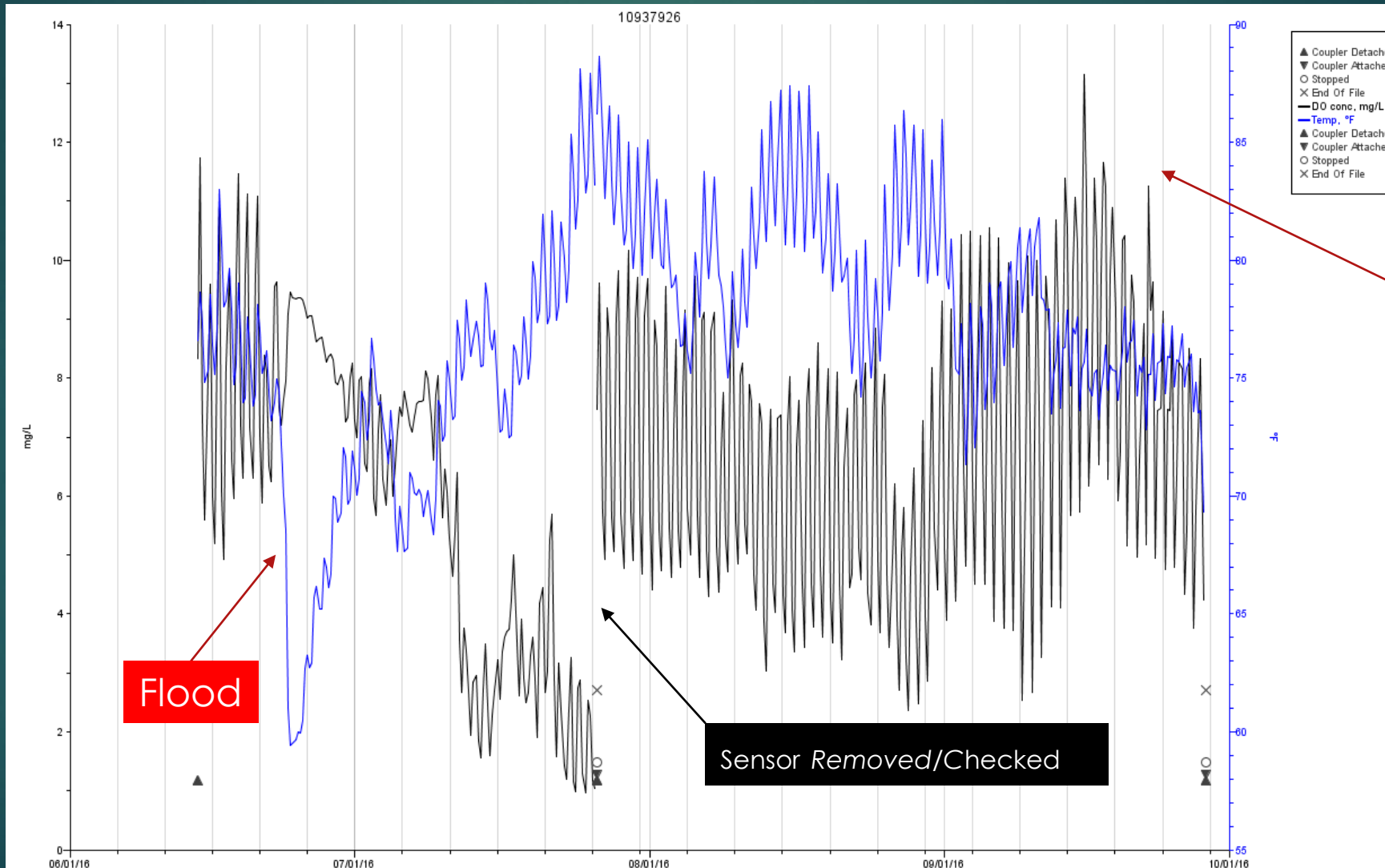
Year	TP (mg/L)	DP (mg/L)	NO ₃ -NO ₂ (mg/L)
2014	0.102	0.102	0.287
2015	0.106	0.0921	0.202
2016	0.0409	0.0367	0.12

Sensors Deployed



Continuous Monitoring (DO / Temp.)

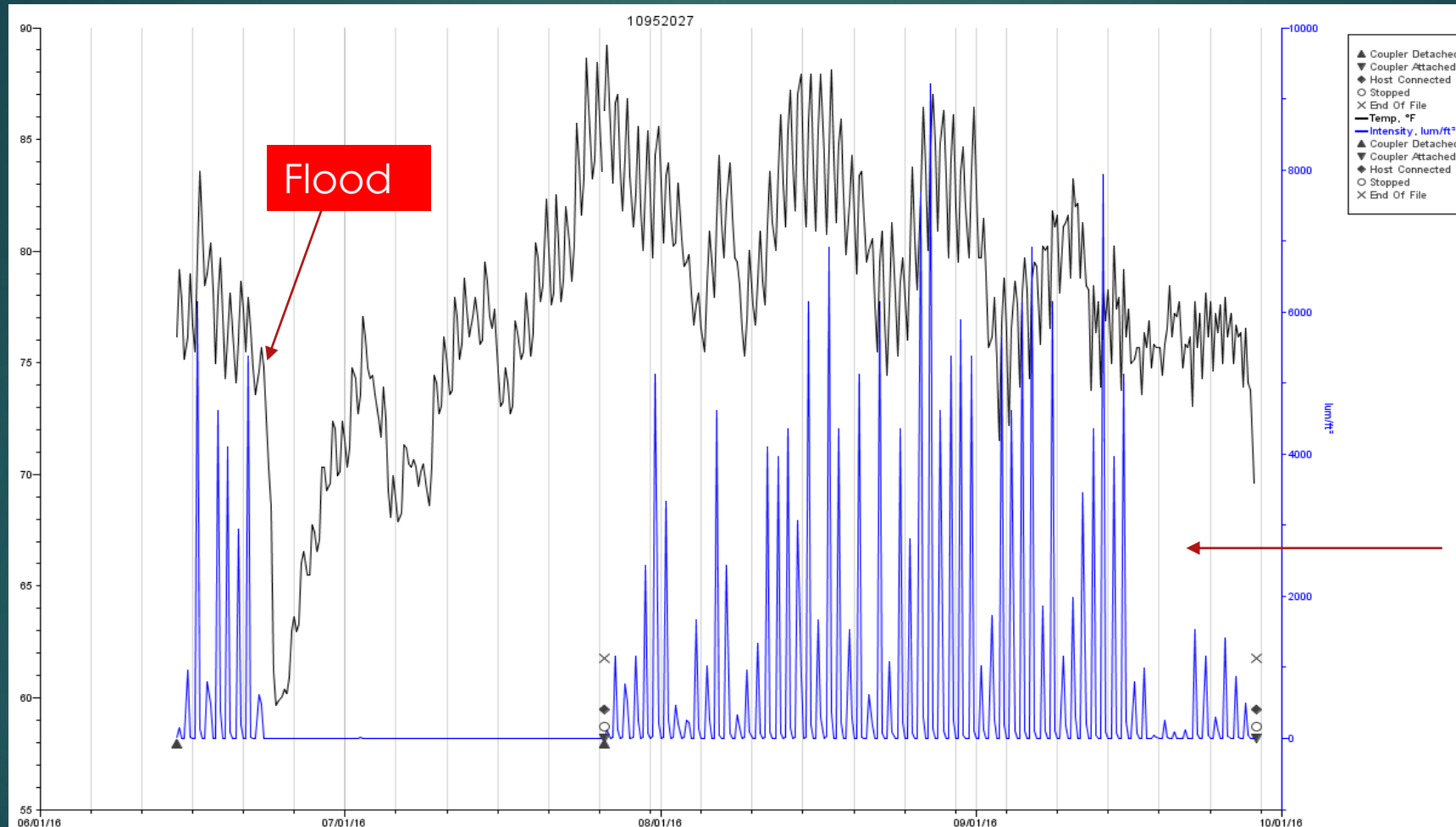
AGB-RR / 6 hours



Peak Algae Bloom

Continuous Monitoring (Light / Temp.)

AGB-RR / 6 hours



Progress - New Ronceverte Sewage Treatment Plant



Tygart Valley River

September 14th

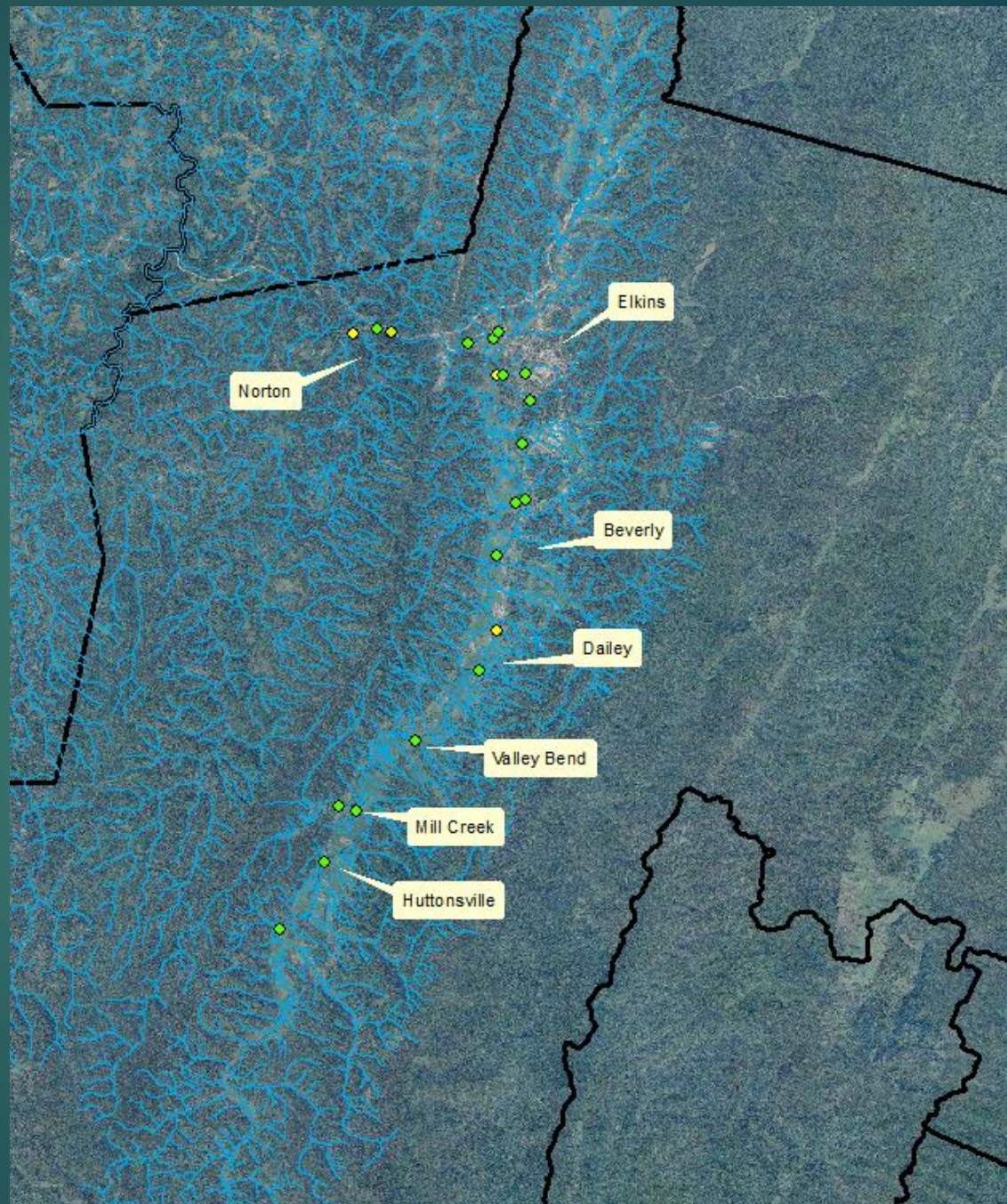
Below Elkins Dam - >90%



ATV-BCOO (Upstream Beaver
Creek – Golf Course Access)
20-40%



Tygart Sample/ Observation Points



Tygart Valley River Longitudinal

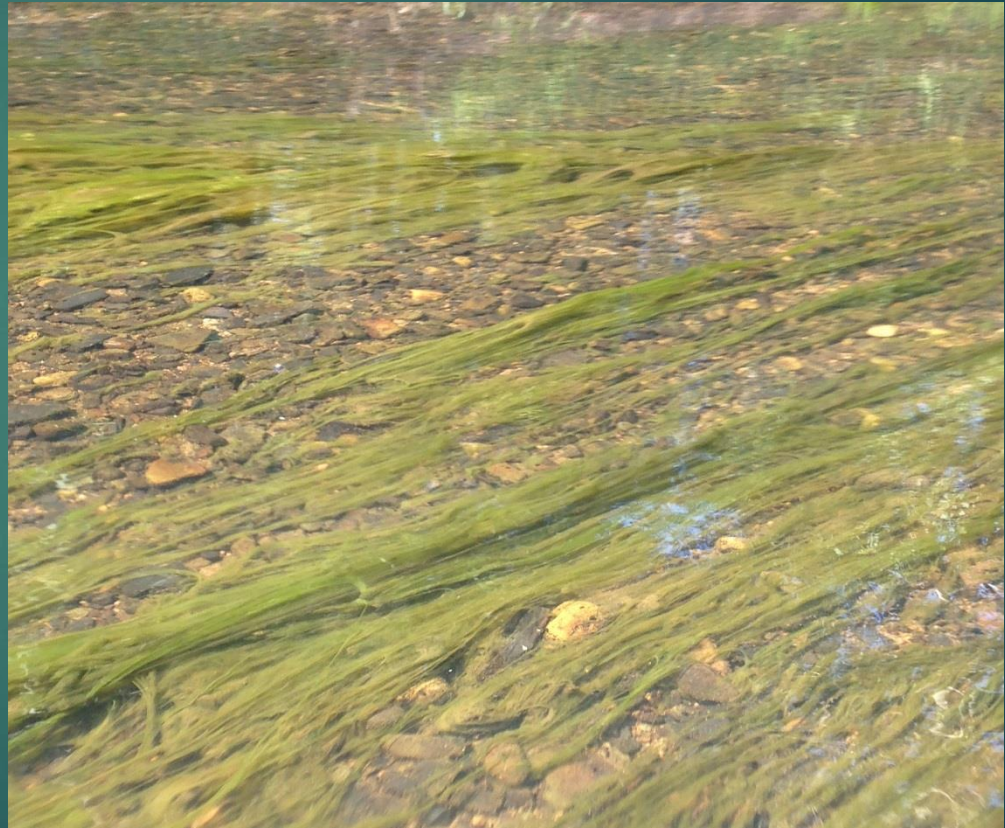
Mill Creek – Valley Bend

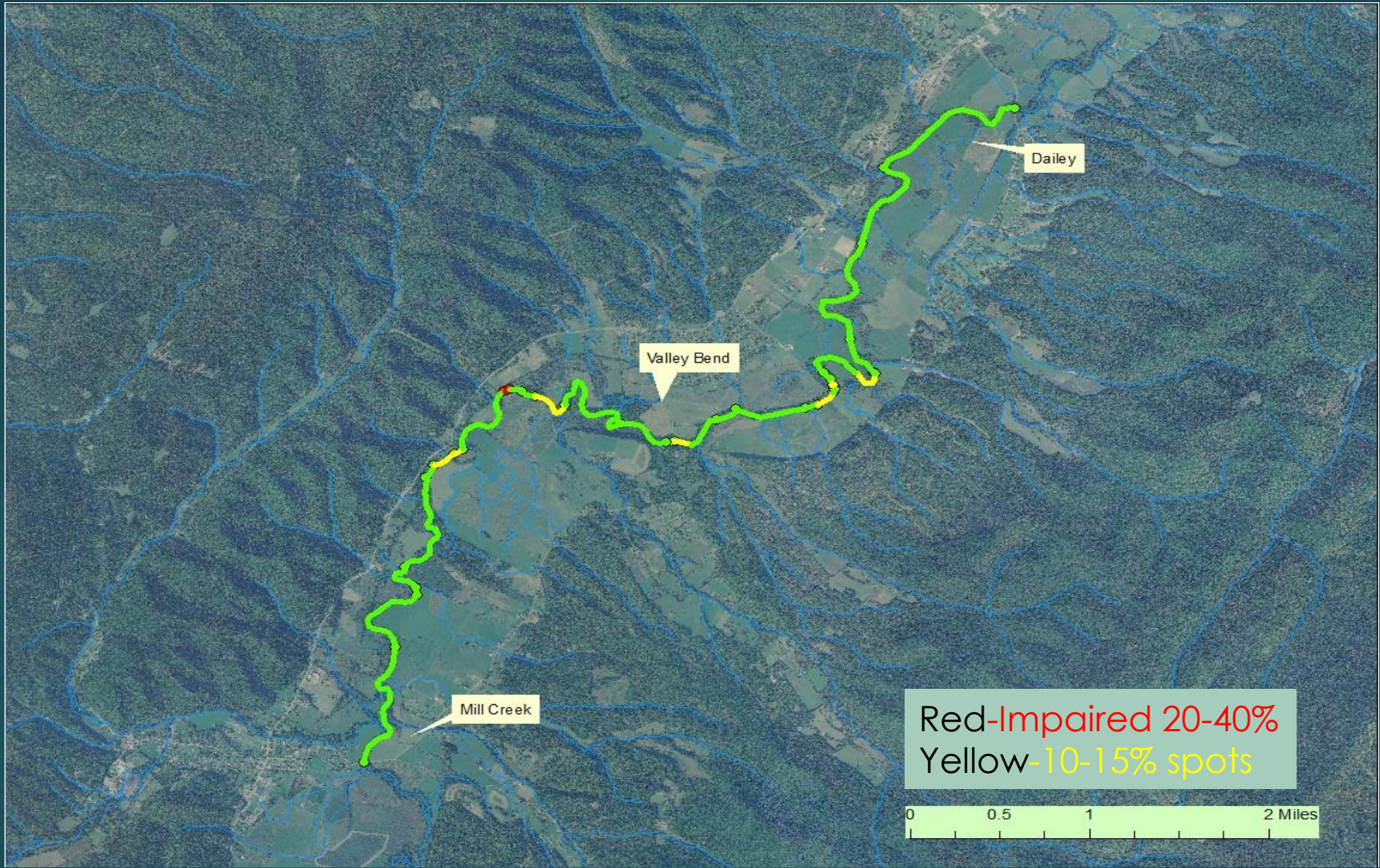
August 30th (20-40% - 3X)



Tygart-Longitudinal

10-15%





South Branch Longitudinal-"The Trough"

September 1st

>20%(Not 3X)



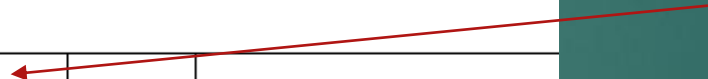
Cacapon River Longitudinal

>40% / ~ 2.2 miles



Production

Location	Date	DO (mg/L)	Time	%Algae Coverage
AGB-HC	8/17/2016	5.26	12:45	<1
	9/28/2016	8.81	15:35	30
AGB-RR	8/17/2016	7.03	10:35	<3
	9/28/2016	13.49	12:00	63.75
AGB-R2	8/17/2016	4.48	11:50	<3
	9/28/2016	12.05	14:25	67.35
AGB-FS	8/17/2016	6.15	10:00	<3
	9/28/2016	7.56	11:05	47.01
CA-RMRK	6/20/2016	7.85	14:00	<1
	7/14/2016	14.29	14:42	52.04
ATV-E2	7/25/2016	9.39	16:50	<3
	9/14/2016	14.3	16:30	15 (90-upstream)



Phosphorus

Location	Date	TP (mg/L)	DP (mg/L)	%Algae Coverage
<i>AGB-RR</i>	8/17/2016	0.0319	0.0245	<3
	9/28/2016	0.0306	0.0206	63.75
<i>AGB-Milligan Creek</i>	7/26/2016	0.0385	0.0232	<1
	8/17/2016	0.0265	0.0183	50
<i>CA-RMRK</i>	6/20/2016	0.0431	0.0243	<1
	7/14/2016	0.0187	0.0115	52.04
<i>ATV-E2</i>	7/25/2016	0.0871		<3
	9/14/2016	0.07		15 (90-upstream)
<i>ATV-BCOO</i>	7/25/2016	0.0342		<3
	9/14/2016	0.0954		20-40(3X-Width)

Hardness Ceiling – 100 mg/L
 Alkalinity >30 mg/L

*Small streams?

Stream	Hardness (mg/L CaCO ₃)	Alkalinity (mg/L)
Greenbrier	19.5-104.8	42.8-90.4
Mean	80.7	70.7
Tygart	30.7-119.9	27.2-97.2
Mean	54.5	48.5
Buckhannon	73.3-151.2	27.6-36.6
Mean	103.8	33.1
Cacapon	43.1-102.6	34.1-91.8
Mean	82.7	73.8

	Howard Creek	Milligan Creek
Hardness (mg/L)	168.2	203.9
Alkalinity (mg/L)	112.3	183.5

Milligan Creek



Howard Creek



% Water Column Filled

- ▶ AGB-FS = 17.04%
- ▶ AGB-R2 = 15.49%
- ▶ AGB-RR = 12.71%
- ▶ AGB-BC1 = 4.11%
- ▶ CA-RMRK = 19.65%
- ▶ SB-L-Trough = 8%

No Impairment documented

- ▶ Buckhannon (highest 12%)
- ▶ South Branch (10-15% in spots) – To De-list
- ▶ New River (Sandstone <5%)
- ▶ Bluestone River (SAV)

Report Nutrient/Algae Issues:

Currently developing tool for public reporting on website-
stay tuned

Thoughts / Concerns?

James Peterson

WV Dept. of Environmental Protection

Water Quality Standards Program

Division of Water and Waste Management

Office: 304-926-0499 x 1044

Email: James.A.Peterson@wv.gov

Agenda

Introductions – WQS Staff, Attendees

2016 Nutrient Criteria Development Plan

2016 Algae Monitoring Water Sampling – Jamie Peterson

2017 Triennial Review Update

2017 Triennial Review Timeline

- **June** – Submitted Rule for Public Comment
- **August 9** – Public Hearing held at DEP in Kanawha City
- **August 26** – Submitted Agency-Approved Rule to Secretary of State
- **Fall 2016** – Legislative Rule-Making Review Committee meets
- **2017 Legislative session** – Rule will go through Legislative process
- **Spring 2017** – After authorized submit to EPA for approval

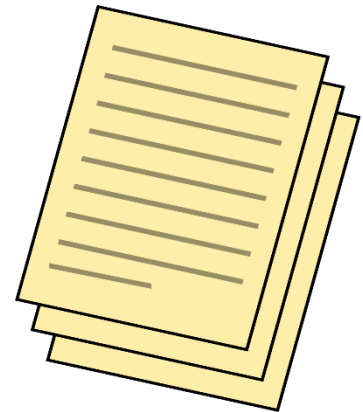
DEP-Proposed Changes

- Category A, addition of Subsection 6.3 – 6.10
- Critical design flow for human health criteria, subsection 8.2.b
- Adding Biotic Ligand Model (BLM) for copper, subsection 8.5.a
- *E. coli* replacing Fecal Coliform, subsection 8.13
- Aquatic life criteria added, subsection 8.23

Comments Received

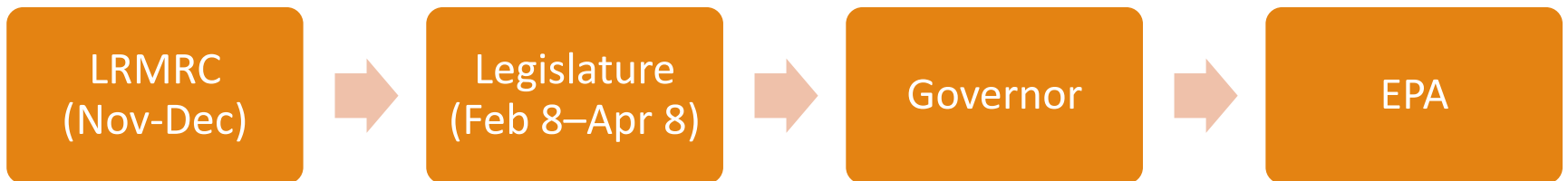
- 33 people attended public hearing
- 13 attendees spoke at public hearing
- Received 216 written comments
- Accumulated a 552-page comment document, including all comments and DEP responses

**Read all 552
pages [here!](#)**



Next Steps

- Legislative Rule-Making Review Committee will review rule
- LRMRC changes will be made & rule re-submitted to Sec of State
- Legislative process will commence
- If signed by Governor, will be submitted to EPA for approval



Further Discussion



What else should we discuss?

What should we discuss next time?

Reach me at:

Laura Cooper

Office: 304-926-0499 x1110

Email: Laura.K.Cooper@wv.gov