West Virginia Bond Forfeiture Program
Law Suite Surrounding Violations of the CWA

- WV entered into two identical consent decrees as both the WV northern district court and the southern district court ruled that WV was in violation of the CWA.

- WV is now required to apply for and obtain NPDES permits at 192 bond forfeiture sites state wide.

- As a requirement of the consent decrees OSR was to develop a treatment cost report indicating capital cost and O&M cost for treating the water discharged from each site to meet WQBELs.
Treatment Cost Report

- To accomplish this OSR looked at efficiencies of each existing treatment system.

<table>
<thead>
<tr>
<th>Site Nom</th>
<th>Project Name</th>
<th>Sample #</th>
<th>PH (pH, ¥&lt;9)</th>
<th>T_Fe (¥&lt;1.42)</th>
<th>Mn (¥&lt;2)</th>
<th>Al (¥&lt;0.45)</th>
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<td>100.00%</td>
<td>100.00%</td>
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<td>90.00%</td>
<td>100.00%</td>
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<td>100.00%</td>
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</table>
Treatment Options

- OSR Evaluated options needed to meet presumed NPDES compliance limits:
  - Additional ponds down gradient
  - Acquiring property
  - Improving mixing efficiencies
  - Bringing in Electricity
  - Pumping raw water to beginning of treatment
  - Adding baffles
  - Combining outlets
Treatment Cost Report
(as of 6-29-2012)

New Capital Cost Estimates to complete construction of remaining treatment sites and retrofit existing treatment sites = $35,463,323

Newly Estimated O&M Cost = $6,649,008
Additional Cost

- NPDES Fees:
  - $144,000 for NPDES Filling Fees @ $1,000/each
  - $10,500 for NPDES Modification Fees @ $500/each
  - Reissuance Fee of $1,000 paid for each permit every five years

- Reality Cost:
  - Surveying - $183,460
  - Land/Easement Purchases - $79,331
Are we using our limited resources wisely? To help understand this we have to look at two watersheds.
WV has been treating mine drainage at forfeited mine sites within the Three Forks watershed as early as 2001. The Office of Special Reclamation (OSR) has constructed 6 active treatment sites and 3 passive treatment systems at nine bond forfeiture sites within the watershed and we now have eleven NPDES outlets.
Three Forks Creek Watershed Bond Forfeiture Site Locations

- ** Permit Name **
- ** Completion Date **
- ** Capital Cost **
- ** Total O&M Cost to Date **
- ** Annual O&M Cost **

**ED-E Development**

- Completion Date: 1-14-2004
- Capital Cost: $1,139,719
- Total O&M Cost to Date: $1,045,429
- Annual O&M Cost: $104,543

**ED-E Development**

- Completion Date: 11-30-2001
- Capital Cost: $679,370
- Total O&M Cost to Date: $192,896
- Annual O&M Cost: $14,838

**VMS LTD**

- Completion Date: 6-12-2010
- Capital Cost: $862,424
- Total O&M Cost to Date: $113,224
- Annual O&M Cost: $28,306

**Preston Energy**

- Completion Date: 4-7-2005
- Capital Cost: $246,908
- Total O&M Cost to Date: $465,216
- Annual O&M Cost: $51,690

**Passive Treatment Site**

- Location: TBC

**Chemical Treatment Site**

- Location: TBC
Three Forks Creek Watershed
Bond Forfeiture Site Locations

In 2010 benthic macro-invertebrate surveys and fish surveys were conducted by the WVDEP Watershed Assessment Branch (WAB) at four locations along the mainstem of Three Fork Creek.

Results indicated a diminished benthic population at all four locations. WAB only identified eight taxa and three EPT species.

Results of the fish survey were even more discouraging having only found one fish, a green sunfish caught at 0.4 miles from the confluence with the Tygart Valley River.
In July of 2010 WVDEP’s AML program stepped up to address the AMD problem initiating the:

**Three Fork Creek Watershed Restoration Project**

Preston County, West Virginia
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

- Project Start Date: July 19, 2010
- Project Completion Date: April 15, 2011
- Initial Construction Cost: $750,491.15
Three Fork Creek Watershed Restoration Project
Preston County, West Virginia

Restoration Goals

The Three Fork Creek Watershed Restoration Project was initiated through a combined effort of AML, West Virginia University (WVU) and the Save the Tygart watershed group. The goal of the project was to return Three Fork Creek mainstem to its designated stream usage by decreasing the water quality impairment of multiple pre-SMRCA coal mine discharges within the watershed.

Objectives for obtaining this goal were to:

• Improve water chemistry and aesthetics to support recreational water activities in Three Fork Creek mainstem, and
• Restore benthic macro-invertebrates and fish in Three Fork Creek mainstem.
Drainage area = 103 mi²

Stream length = 18.5 miles

- **Three Fork Cr**
  - pH ~ 5.1 s.u.
  - Acidity ~ 21.87

- **Raccoon Cr**
  - pH ~ 4.1 s.u.
  - Acidity ~ 96.15

- **Squires Cr**
  - pH ~ 3.35 s.u.
  - Acidity ~ 101.58

- **South Fork Birds Cr**
  - pH ~ 3.8 s.u.
  - Acidity ~ 95.56

- **North Fork Birds Cr**
  - pH ~ 3.8 s.u.
  - Acidity ~ 55.05
In 2012 benthic macro-invertebrate surveys and fish surveys were conducted by WAB at the same four locations along the mainstem of Three Fork Creek.

Benthic results were impressive, increasing the total taxa to fifteen with eight EPT taxa.
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

Results of the fish survey were even more dramatic. Less than two years after the initiation of in-stream treatment 1,605 fish were caught representing 21 species of predator and prey species at the same four locations.
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

More impressive was the presence of numerous young fish, indicating natural reproduction within the watershed.
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

Improvements to the aesthetics of the watershed
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

Raccoon Creek prior to dosing

Raccoon Creek after dosing
Three Fork Creek Watershed Restoration Project

Preston County, West Virginia

Birds Creek prior to dosing

Birds Creek after dosing
Three Forks Creek Watershed

Projects like the Three Forks Creek Watershed Restorations Project truly reveal how wasteful the WV bond forfeiture program has been. Within two years this restoration project has brought life back into the streams, while OSR spent nearly ten years discharging compliant (or nearly compliant) water into dead streams.

We are here today to discuss how we can get bigger benefits for comparable cost.

Are there provisions within the CWA that allow for effective trading programs between point source and no point source contributors?

Can partnerships be formed between; OSR, AML, OSM and, yes, EPA, that will allow for these programs to combine resources to reach a common goal.
LET’S LOOK AT A DIFFERENT WATERSHED
Muddy Creek Watershed

Drainage area = 33.5 mi²

Stream length = 15.6 miles

WV has been treating mine drainage at forfeited mine sites within the Muddy Creek watershed as early as 1995*. OSR has constructed 9 active treatment sites and 1 passive treatment systems at six bond forfeiture sites within the watershed and we now have ten NPDES outlets.

* OSR resumed water treatment upon forfeiture of T&T Fuels in 1995
Muddy Creek Watershed
Water Quality

- **Fickey Run**
  - pH ~ 3.1 s.u.
  - Acid ~ 450 ppm

- **Glade Run**
  - pH ~ 3.5 s.u.
  - Acid ~ 225 ppm

- **Martin Cr**
  - pH ~ 3.15 s.u.
  - Acid ~ 175 ppm

- **Sypolt Run**
  - pH ~ 6.5
  - Alk ~ 25 ppm

- **Muddy Cr @ Cuzzart**
  - pH ~ 7.0
  - Alk ~ 25 ppm

- **Muddy Cr**
  - pH ~ 6.5
  - Alk ~ 15 ppm

- **Crab Orchard Cr**
  - pH ~ 7.5 s.u.
  - Alk ~ 120 ppm

- **Muddy Cr**
  - pH ~ 4.5
  - Acid ~ 18 – 230 ppm
Muddy Creek Watershed

Remaining 12.2 miles considered a trout stream

First 3.4 stream miles is on the 303d list as AMD impaired - SEVERELY
Are we using our limited resources wisely?
Is there language within the CWA that would allow for an in-stream compliance point(s) rather than at-source NPDES permits at low to moderate impact sites?
Muddy Creek Watershed

Restoring the lower 3.4 mile section of Muddy Creek would bring life back to the entire 15.6 miles.

AML can not accomplish this alone – they simply do not have the money.

In-stream dosers installed and Operated in partnership w/ AML
## Larger Contributors of AMD

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<th></th>
<th>GPM</th>
<th>PH</th>
<th>ACIDITY</th>
<th>Acidity_LD lbs/day</th>
<th>T_FE</th>
<th>Fe_LD lbs/day</th>
<th>MN</th>
<th>Mn_LD lbs/day</th>
<th>AL</th>
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T&T Combined Treatment Facility

- Viking
- Preston Energy
- Lime Slurry
- T&T Fuels
- 2 - 60 foot Clarifiers
Muddy Creek Entering the Cheat River

Who is the major contributor of AMD to Muddy Creek?

Can OSR address this problem alone?
Contribution of AMD to Martin Creek by Bond Forfeiture Sites

Average GPM

- Spec Rec Average Totals
- Martin Creek without Special Rec contribution

267.55

4168.34
Contribution of AMD to Martin Creek by Bond Forfeiture Sites

Acidity Loading (lbs/day)

9249

11802.42
Contribution of AMD to Martin Creek by Bond Forfeiture Sites

Total Iron Loading (lbs/day)

878.1
8.83
Contribution of AMD to Martin Creek by Bond Forfeiture Sites

Manganese Loading (lbs/day)

- 12.43
- 260.56
Contribution of AMD to Martin Creek by Bond Forfeiture Sites

Aluminum Loading (lbs/day)

862.59

10.33
Can OSR address this problem alone?
We’ll End With A Bird’s Eye View Of The Muddy Creek AMD Treatment Sites
Rockville Mining
65-78, Site 1
Rockville Mining
65-78, Site 2
Rockville Mining
65-78, Site 4
Rockville Mining
S-65-82, Site 1
Rockville Mining
S-65-82, Site
Rockville Mining
S-65-82, Site 4
So, are we using our limited resources wisely?