

Annual Progress Report to the WV Joint Legislative Oversight Commission on State Water Resources

**West Virginia Department of Environmental Protection
Water Use Section
December 6, 2016**



By:
Brian A. Carr, P.G.
Program Manager
Water Use Section



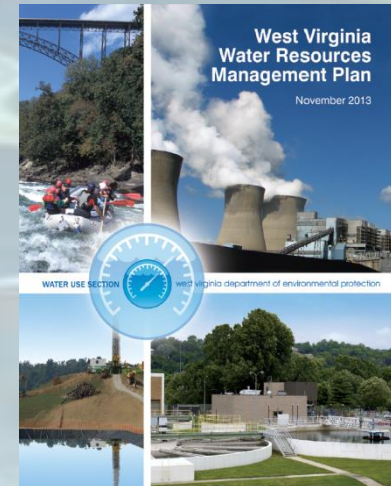
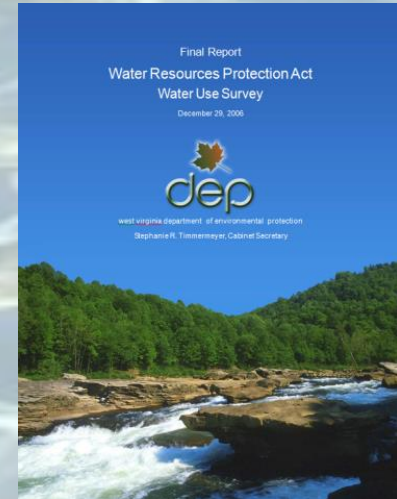
Plan History

The Act Originally passed on March 13, 2004.

On March 8, 2008, Senate Bill 641 passed amending the Act and renaming it the Water Resources Protection and Management Act (The Act).

The Water Use Section was created in July 2008 to accomplish the additional requirements of the Act.

The West Virginia Water Resources Management Plan was submitted on November 22, 2013 and was adopted as part of Senate Bill 373.



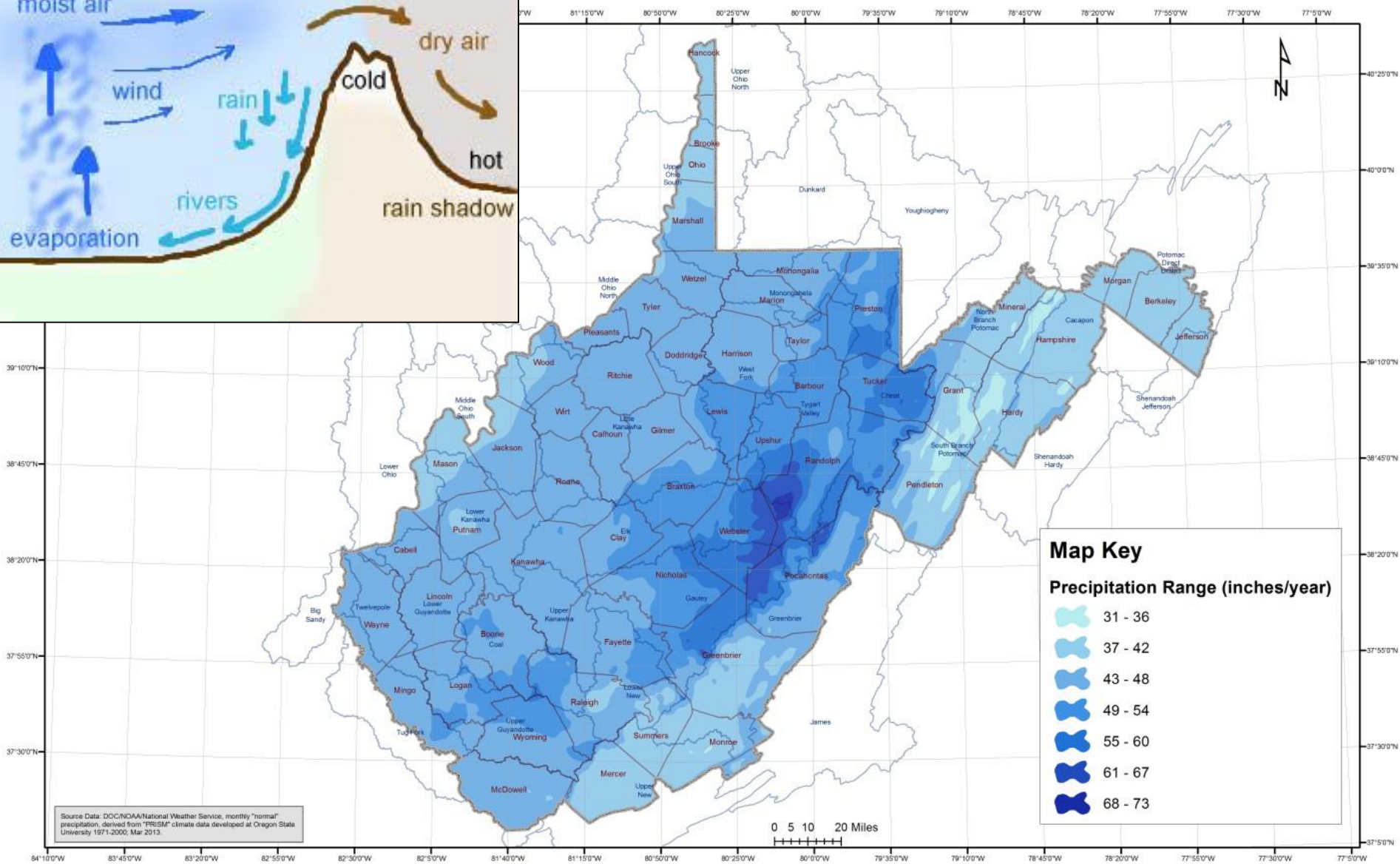
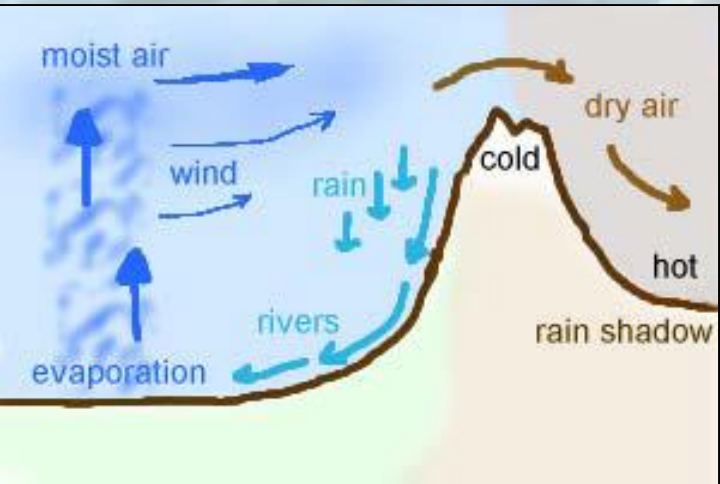
Why collect water use data?

- The Act identified the need for the protection and conservation of our state's water resources.
- It recognizes that a comprehensive assessment of the availability and use of our states water will benefit the citizens of West Virginia: WV Code §22-26.

West Virginia Water Facts

- We average 44 inches of precipitation per year
- The record precipitation event in WV is 19.5" in 2 hours at Rockport in July of 1889
(Last June's event was 10" in 8 hours)
- Maximum storage of lakes - 1 trillion gallons
- Estimated mine pool storage - 1.5 trillion gallons
- Large Quantity Users withdraw approximately 828 billion gallons each year (not including Hydroelectric)
- Based on USGS consumptive use coefficient's, 7.5% of the LQU water is consumed
(most likely higher)
- We have 54,961 total stream miles in our state

Average Annual Precipitation Map



Source Data: DDC/NOAA/National Weather Service, monthly "normal" precipitation, derived from "PRISM" climate data developed at Oregon State University 1971-2000, Mar 2013.

NEW

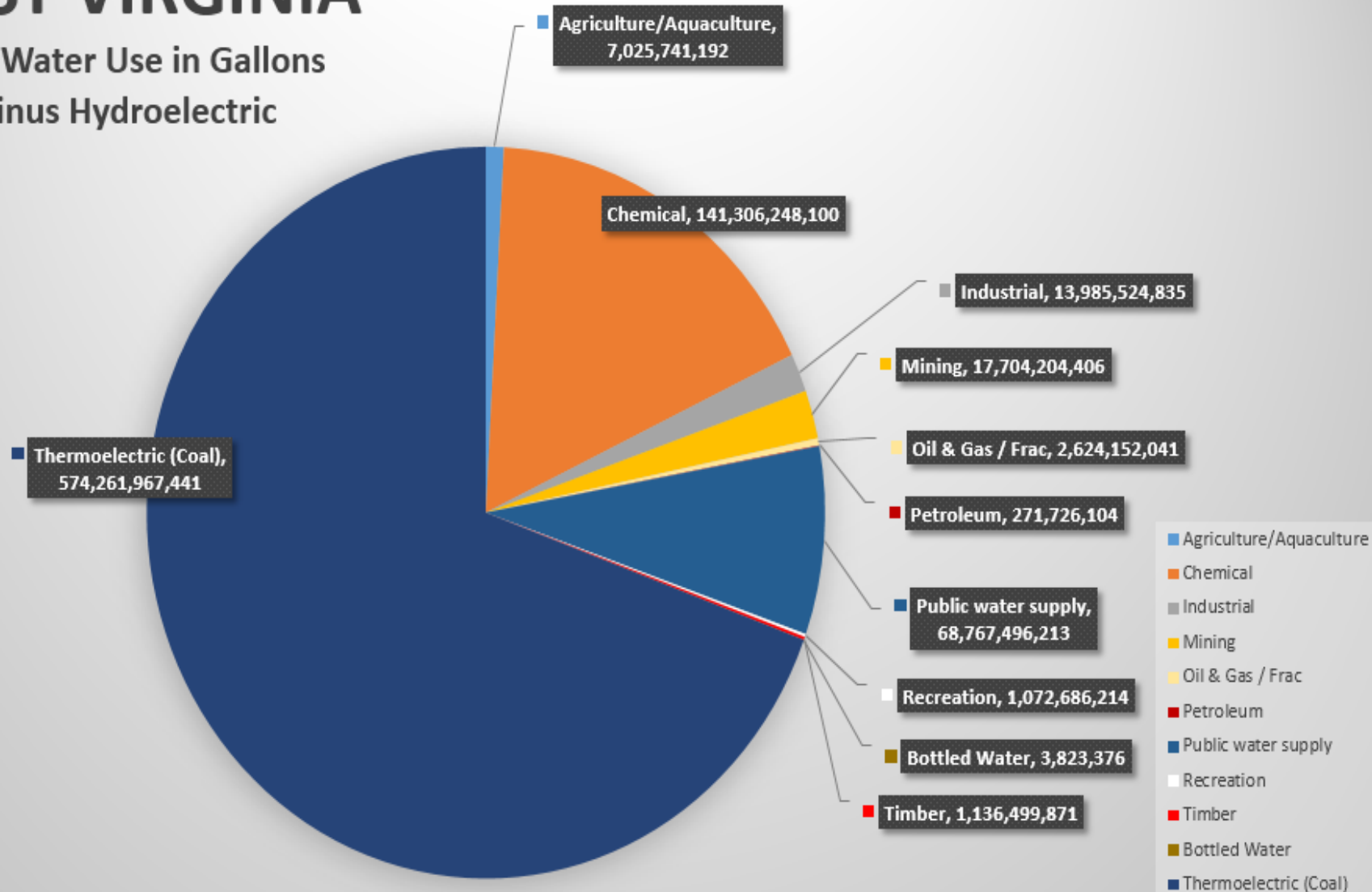
Large Quantity Users (LQU)
Survey now collected on-line

- During 2015 we abandoned the out of date Paper LQU Survey and utilized the DEP Electronic Submission System to allow the LQU's to report their total water usage and other required information on-line.
- This system has proved to be more efficient, easier to use and has been well received by the LQU community.

2015 LQU Water Use

WEST VIRGINIA

2015 Water Use in Gallons
minus Hydroelectric



2015 LQU Water Use

REPORTING_YEAR	FACILITY_TYPE_DESC	Total Gallons
2015	Agriculture/Aquaculture	7,025,741,192
2015	Chemical	141,306,248,100
2015	Industrial	13,985,524,835
2015	Mining	17,704,204,406
2015	Oil & Gas / Frack	2,624,152,041
2015	Petroleum	271,726,104
2015	Public water supply	68,767,496,213
2015	Recreation	1,072,686,214
2015	Timber	1,136,499,871
2015	Thermoelectric (Coal)	574,261,967,441
2015	Hydroelectric	132,142,618,278,591

Total Gallons Withdrawn 2015	828,160,069,793
Total Gallons Consumed 2015	64,188,679,585
Consumptive Use	7.5%
Consumptive Use (-Thermoelectric)	5.8%

2015 WV Bottled Water in Gal/year



• SWEET SPRINGS VALLEY WATER COMPANY	1,700,000
• BERKELEY CLUB BEVERAGES INC.	743,376
• GREEN ACRES REGIONAL CENTER INC	800,000
• UNITED DAIRY, INC. (CHARLESTON)	364,000
• WEST VIRGINIA PRIDE OF THE MOUNTAINS CO	200,000
• CAPON SPRINGS & FARMS, INC.	16,000

Total 3,823,376

Allegheny Lodge Enterprises, LLC is Closed.
Tyler Mountain Water now bottled in Oakland PA.



NEW

New O&G Fracture Water Database

- Capture actual monthly water withdrawal totals from each unique withdrawal location
- Alleviate redundancy to increase reporting compliance. O&G operators are already required to submit some data to fracfocus.org
- Data will be available on calendar year 2016

Horizontal Well

Water Management Plans (WMP's)

- In 2015, this Section reviewed and approved 114 Unique WMP's, which included 582 individual wells.
 - 88 unique WMP's for 469 wells in 2014
- 60 WMP's were modifications to existing WMP's in 2015.
 - 36 modifications in 2014
- Totals for 2016 are expected to be about the same as 2015.

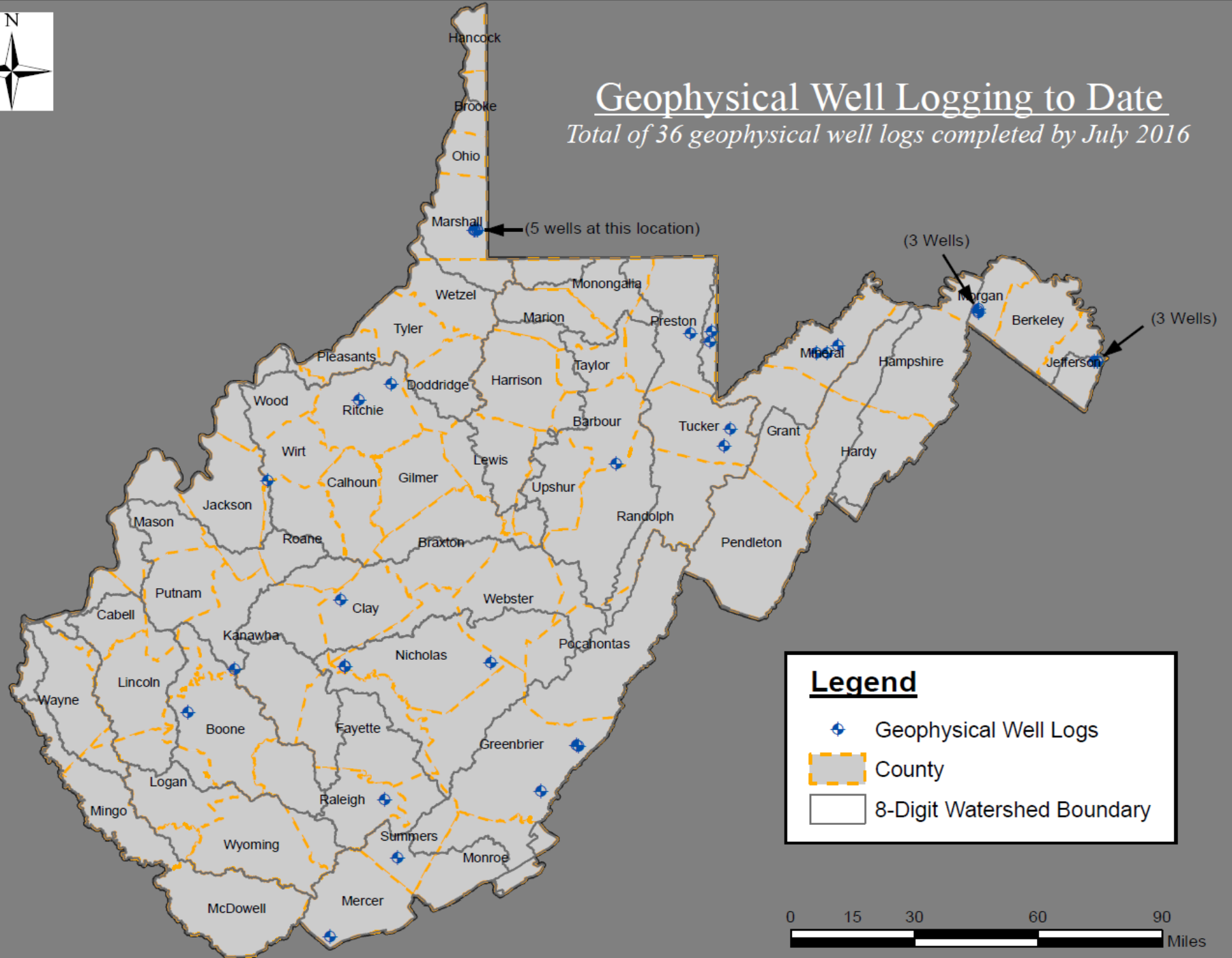
Other Projects and Studies Underway

- Geophysical Well Logging - Groundwater Aquifer Study
- Consumptive Use Study
- Mine Pool Study – location, quantity, quality and sustainability
- Aboveground Storage Tank
 - ZCC, ZPC and SWPA's
 - Extensive coordination with BPH
- Water Conservation Award went to Highland Hospital who Recycles 700,000 gallons of Laundry Water per year.
- Stream Time of Travel Study (contemplated)



Geophysical Well Logging to Date

Total of 36 geophysical well logs completed by July 2016



Legend

- ◆ Geophysical Well Logs
- County
- 8-Digit Watershed Boundary



Water Withdrawal Tool

http://tagis.dep.wv.gov/wwt/

Water Withdrawal Guidance T... WVDEP Water Withdrawal T...

File Edit View Favorites Tools Help

Page Safety Tools

Zoom In Zoom Out Pan

Water Withdrawal from West Virginia Streams

Full Extent ABOUT PDF

Base Map U.S. Topo Aerial Imagery ESRI Streets

Ohio River at Sewickley, PA(g2)

Current Value :4290 cfs Taken at: 09-03-2015 Time: 10:09-AM

Using best professional judgment, you should be able to withdraw water from: Ohio River

USGS Gauge Web Site

Notice

Be advised this guidance tool is less strict than thresholds incorporated into the water management plan for Oil and Gas Permits.

Approved water management plans include safety margins to account for uncertainties related to ungauged streams. Safety margins also increase based on the distance between the gauge and the potential withdrawal locations.

100 km 100 mi

WVWRMP Mapping Tool

Google search: wvwaterplan and click the Blue Button

The screenshot shows the West Virginia Department of Environmental Protection (WVDEP) website. At the top, there is a navigation bar with the WVDEP logo and the text "west virginia State Agency Directory | Online Services". A search bar on the right contains the text "Search WV DEP". Below the navigation bar, the main header features the WVDEP logo and the text "west virginia department of environmental protection - Promoting a Healthy Environment".

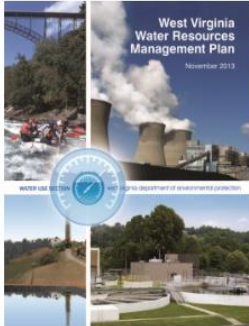

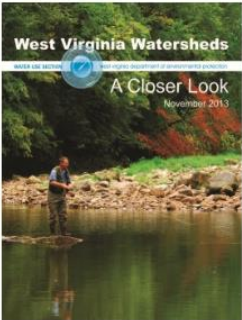
The main content area is titled "DEP Offices | Agency History | News | Outlook Web Access | Text size A A A". Below this, a breadcrumb trail reads "Home > Water and Waste Management > Water Use Section > WV Water Resources Management Plan". The main heading is "West Virginia Water Resources Management Plan".

The introductory text states: "Welcome to the WVDEP Water Use Section Public Information Portal. This website was developed in cooperation with the Center of Environmental, Geotechnical, and Applied Sciences (CEGAS) at Marshall University. It serves as a public information portal for data related to water use in West Virginia. The Water Use Section of the WV DEP was developed as a result of the Water Resources Protection and Management Act of 2008. On this site, you have access to reports from the Large Quantity User and Marcellus Shale Frac Water databases. Additionally, there are many other related datasets displayed for the West Virginia Water Plan Mapping Tool."

A blue button labeled "WV Water Resources Management Plan Mapping Tool" is prominently displayed. Below it, the text reads: "To view the 'West Virginia Water Resources Management Plan', the 'West Virginia Watershed Atlas', or the 'West Virginia Watersheds: A Closer Look' documents please click on the corresponding image below. *Please note that the files are quite large and may take several minutes to load into your browser."

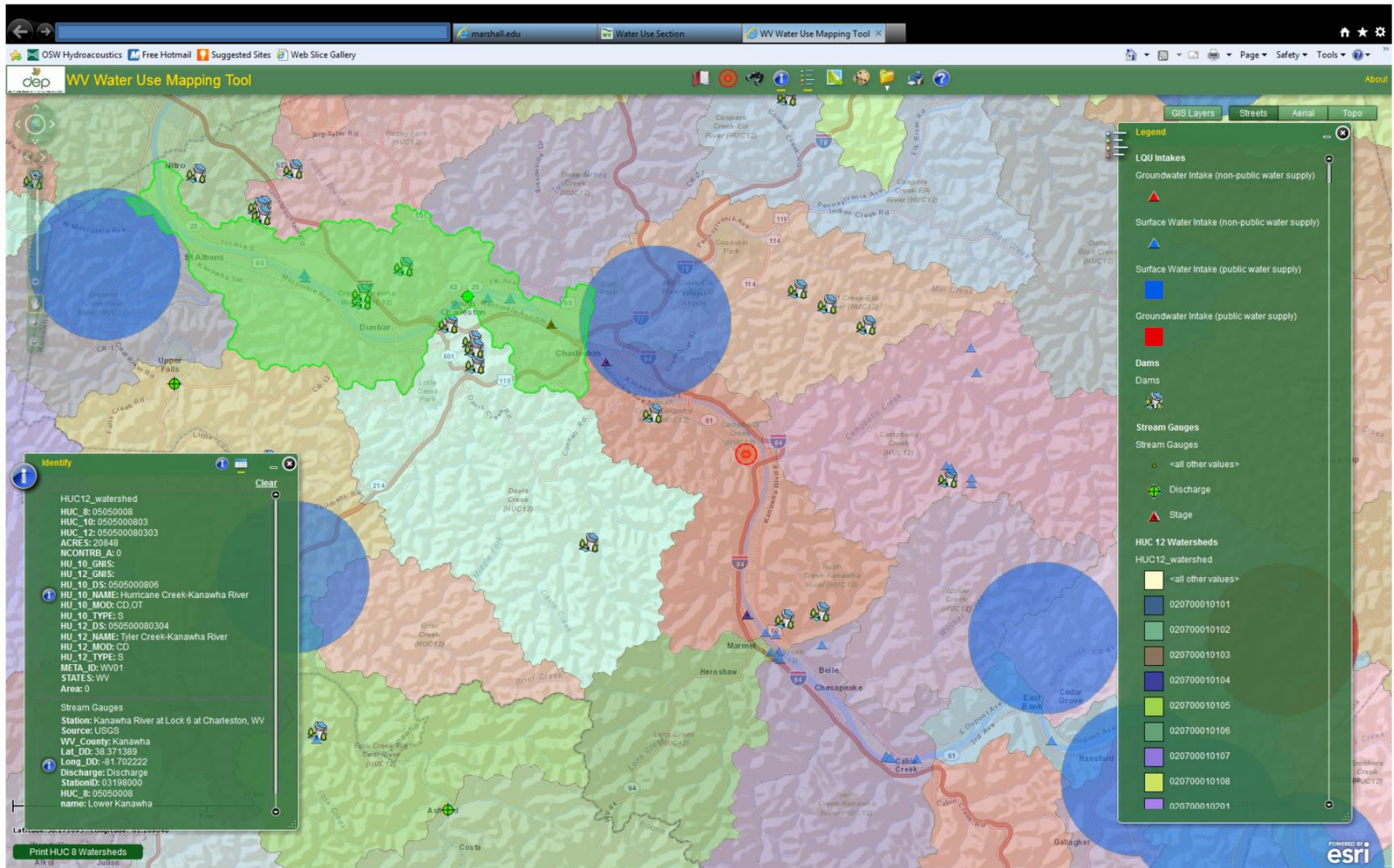
On the left side of the page, there is a vertical menu with the following items: "Water Withdrawal Guidance Tool", "WV Water Resources Management Plan", "Progress Reports - Water Resources Protection & Management Act", "State Rules and other related documents", "Frac Water Reporting Form", "Annual Certification-Large Quantity Users", "Mine Pool Atlas", "WV Water Laws, Regulations, and Rights", and "Helpful Links".

At the bottom of the page, there are three image thumbnails with their respective filetypes:

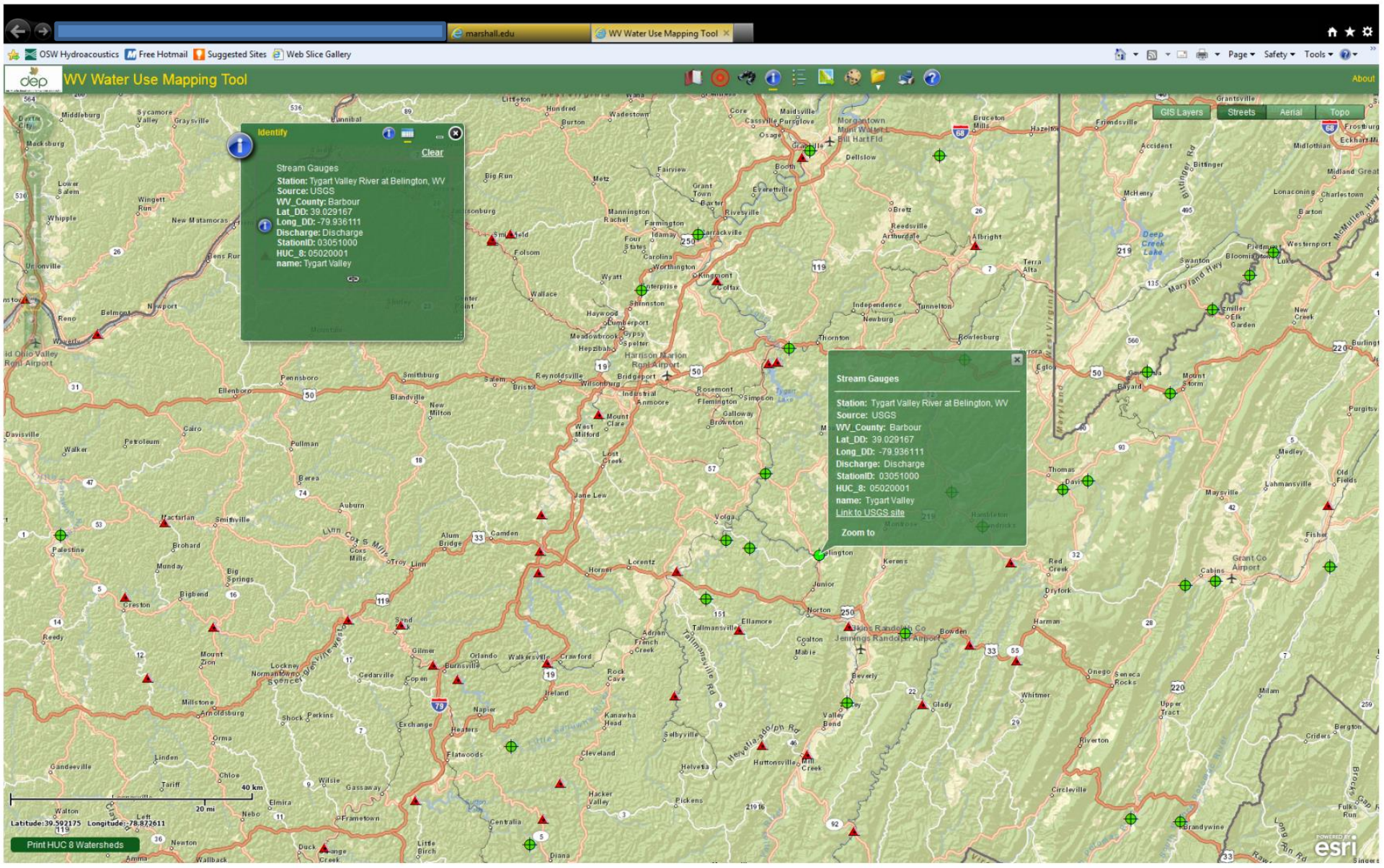
-  West Virginia Water Resources Management Plan
November 2013
Filetype: PDF (45 MB)
-  West Virginia Watershed Atlas
November 2013
Link to Watershed Maps
-  West Virginia Watersheds
A Closer Look
November 2013
Filetype: PDF (30 MB)

The WVDEP logo is visible in the bottom right corner of the page.

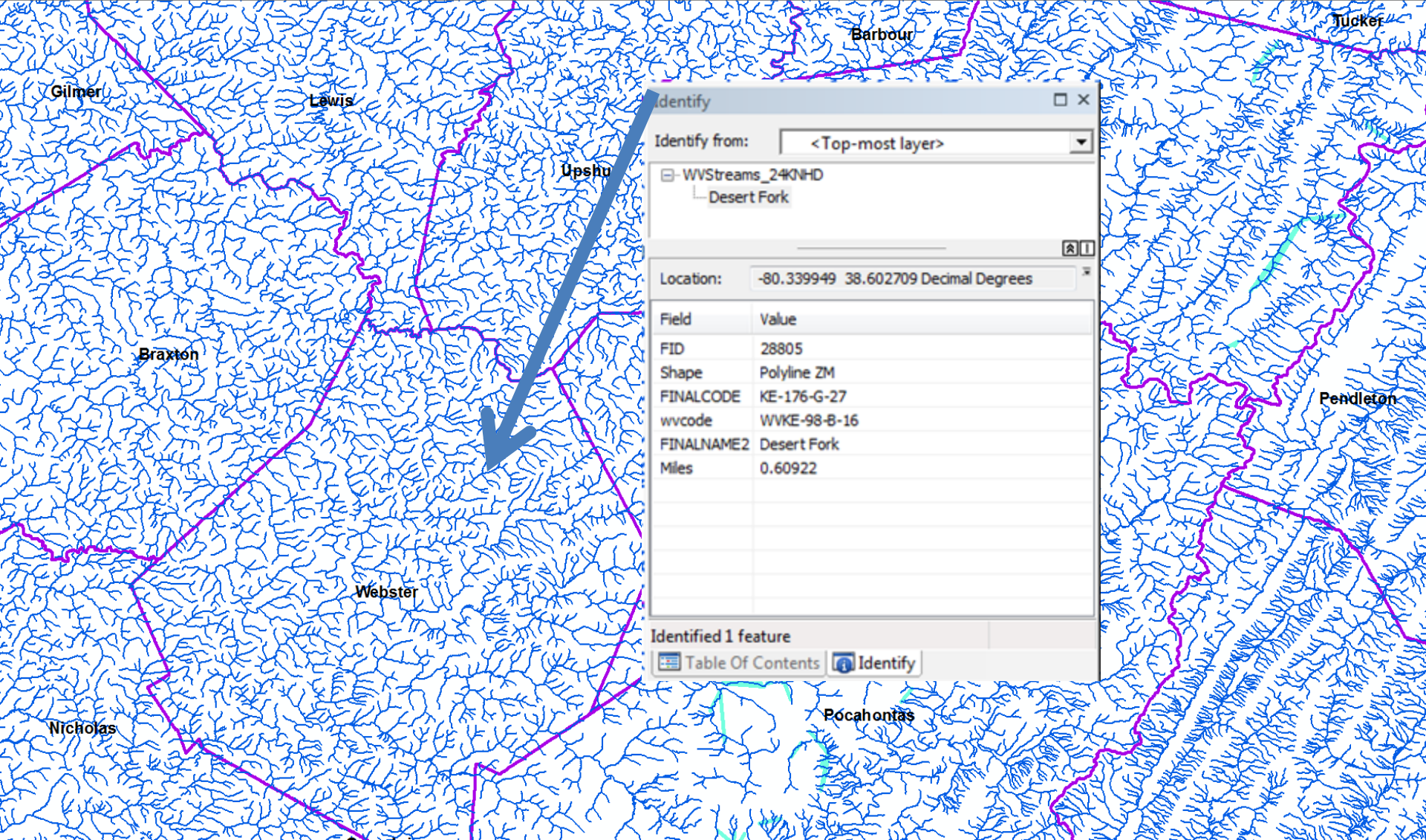
Overlap multiple GIS Layers



Stream Gauge Layers



New NHD24 Stream Layer



Identify

Identify from: <Top-most layer>

- WVStreams_240NHD
 - Desert Fork

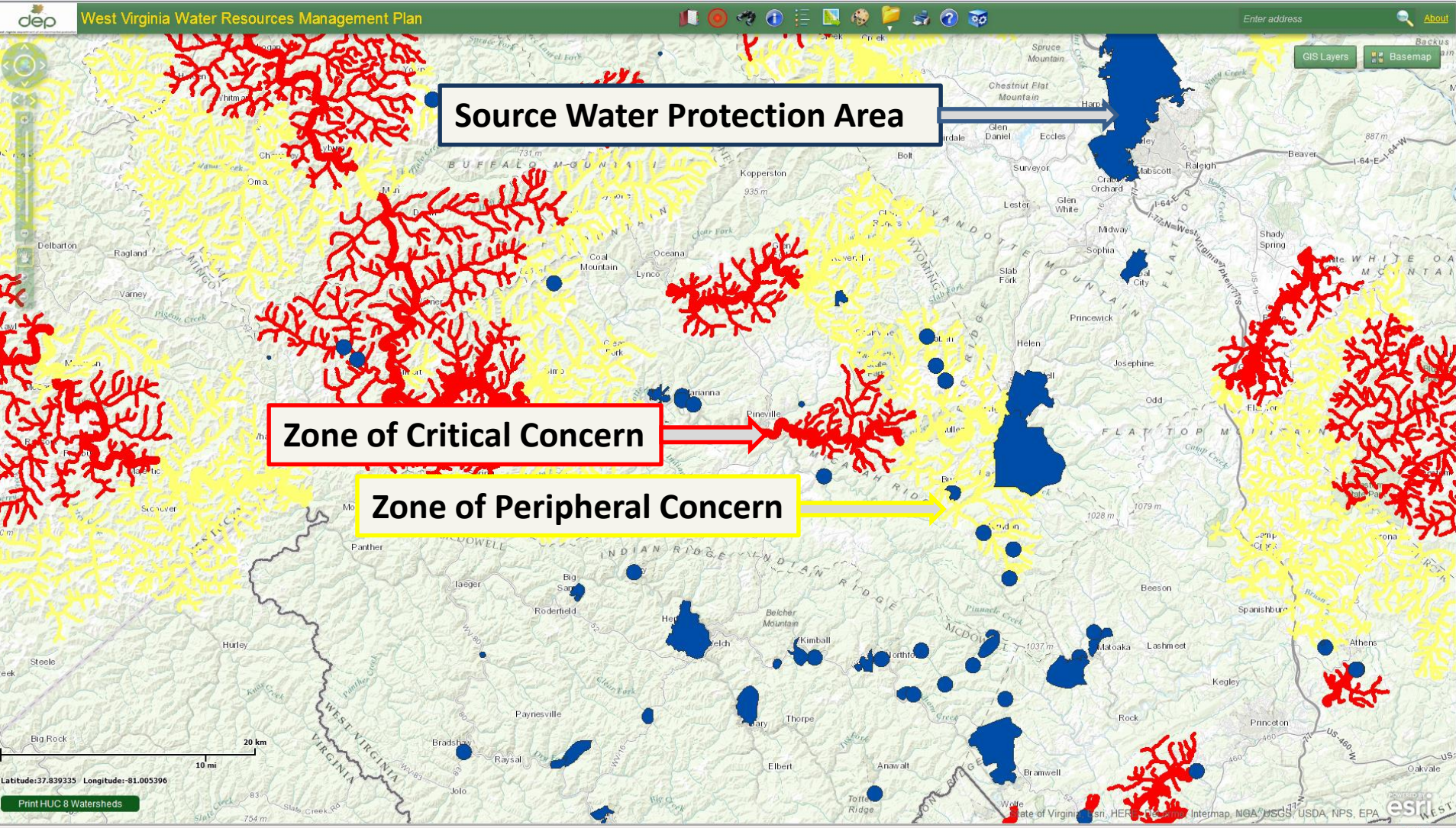
Location: -80.339949 38.602709 Decimal Degrees

Field	Value
FID	28805
Shape	Polyline ZM
FINALCODE	KE-176-G-27
wvcode	WVKE-98-B-16
FINALNAME2	Desert Fork
Miles	0.60922

Identified 1 feature

Table Of Contents Identify

DHHR ZCC, ZPC and SWPA Layer



[Climate_Features](#)
[Climate_Features.zip](#)
[County](#)
[County.zip](#)
[Dams](#)
[Dams.zip](#)
[Demographics](#)
[Demographics.zip](#)
[EcoRegions](#)
[EcoRegions.zip](#)
[Geology_Type](#)
[Geology_Type.zip](#)
[Groundwater](#)
[Groundwater.zip](#)
[Groundwater_Monitoring](#)
[Groundwater_Monitoring.zip](#)
[Industrial](#)
[Industrial.zip](#)
[Land_Features](#)
[Landcover](#)
[Landcover.zip](#)
[Layouts](#)
[LOU_intakes_buffer](#)
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[NHD_Streams](#)
[NHD_Streams.zip](#)
[NPDES](#)
[NPDES.zip](#)
[OG_Wells_WMAS](#)
[OG_Wells_WMAS.zip](#)
[Precipitation](#)

**Downloadable
shape files are
available for
individuals,
companies,
consultants and
economic
development
professionals.**

[Precipitation.zip](#)
[PublicLandsByDNR](#)
[Regions](#)
[Rivers](#)
[Rivers.zip](#)
[Springs](#)
[Springs.zip](#)
[Stream_Gauges](#)
[Stream_Gauges.zip](#)
[Surface_Water](#)
[Surface_Water.zip](#)
[SWAP](#)
[SWAP.zip](#)
[Temperature](#)
[Temperature.zip](#)
[Tier3](#)
[Tier3.zip](#)
[Watershed_HUC06](#)
[Watershed_HUC06.zip](#)
[Watershed_HUC08](#)
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[Watershed_HUC10](#)
[Watershed_HUC10.zip](#)
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[Wetlands](#)
[Wetlands.zip](#)
[WV_Watersheds](#)

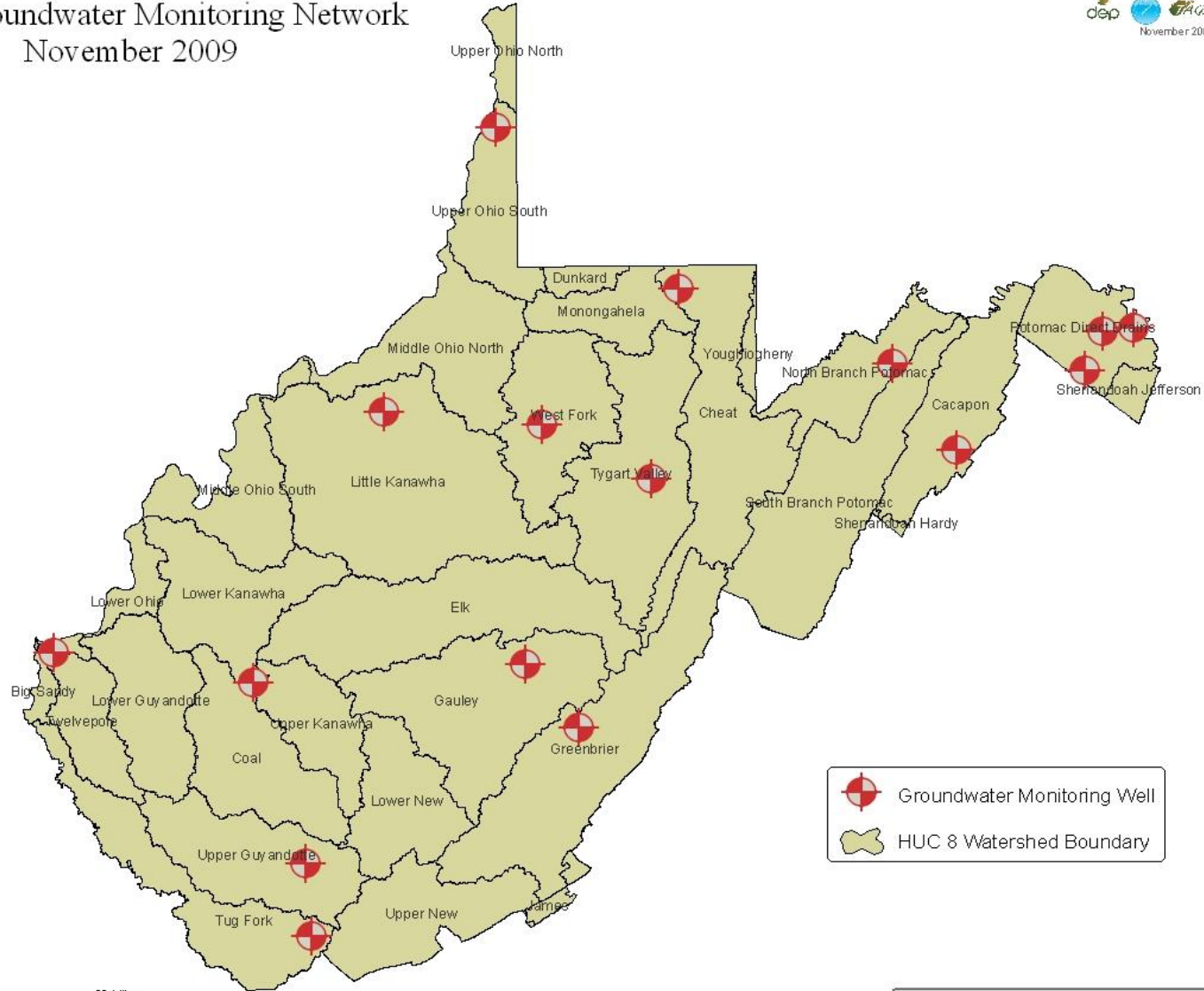
Stream Gage Funding

- It costs about 2.9 million per year to fully fund our states stream gage network.
- The cost is currently supported by ~~five~~ four state agencies, the ACoE, the USGS and some private industries.
- The four state agencies contribute \$282,000 to fund the core gaging network.
- DNR, DEP and BPH worked hard to plug the WVCA 125k funding gap.
- Although 2017 Funding has been secured, it was only due to significant effort. Every year is a funding challenge.
- All of our water resource science and web tools are dependent on data collected by this Stream Gaging network.

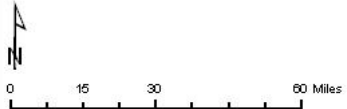
GW Monitoring Network

Funded by DEP's GW Section and Federal Match

Current Groundwater Monitoring Network
November 2009



Groundwater Monitoring Well
HUC 8 Watershed Boundary



Water Rights On the Potomac River

BRIAN E. FROSH
Attorney General



STATE OF MARYLAND
OFFICE OF THE ATTORNEY GENERAL

FACSIMILE NO.

ELIZABETH F. HARRIS
Chief Deputy Attorney General

CAROLYN QUATTROCKI
Deputy Attorney General

DONNA HILL STATON
Deputy Attorney General

WRITER'S DIRECT DIAL NO.

November 22, 2016

The Honorable Patrick Morrissey
Office of the Attorney General
State Capitol Complex
Building 1, Room E-26
Charleston, WV 25305

Dear Attorney General Morrissey:

We are writing in response to your letter concerning West Virginia's water withdrawals from the Potomac River. Maryland officials have long acknowledged that West Virginia has the same rights on the Potomac River as those described by the Supreme Court in *Virginia v. Maryland*. Since that case was decided in 2003, the Maryland Department of the Environment

QUESTIONS ?



WV department of environmental protection

-Promoting a healthy environment