

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

**West Virginia Department of Environmental Protection**

**Water Use Section**

**October 18, 2015**

**By:**

**Brian A. Carr, P.G.**

**Program Manager**

**Water Use Section**



# Plan History

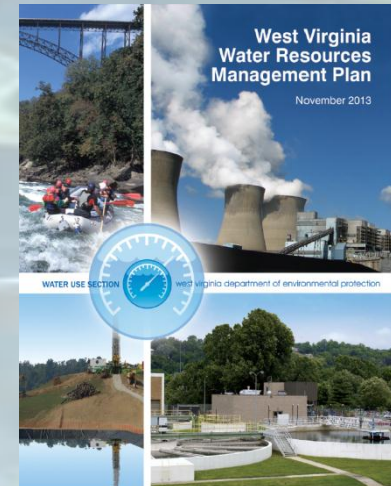
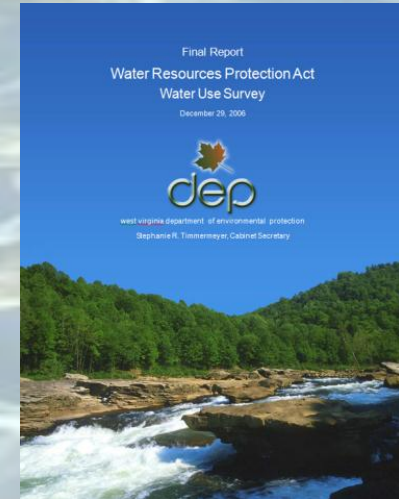
**The Act Originally passed on March 13, 2004.**

**First Large Quantity User Survey completed in 2006.**

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



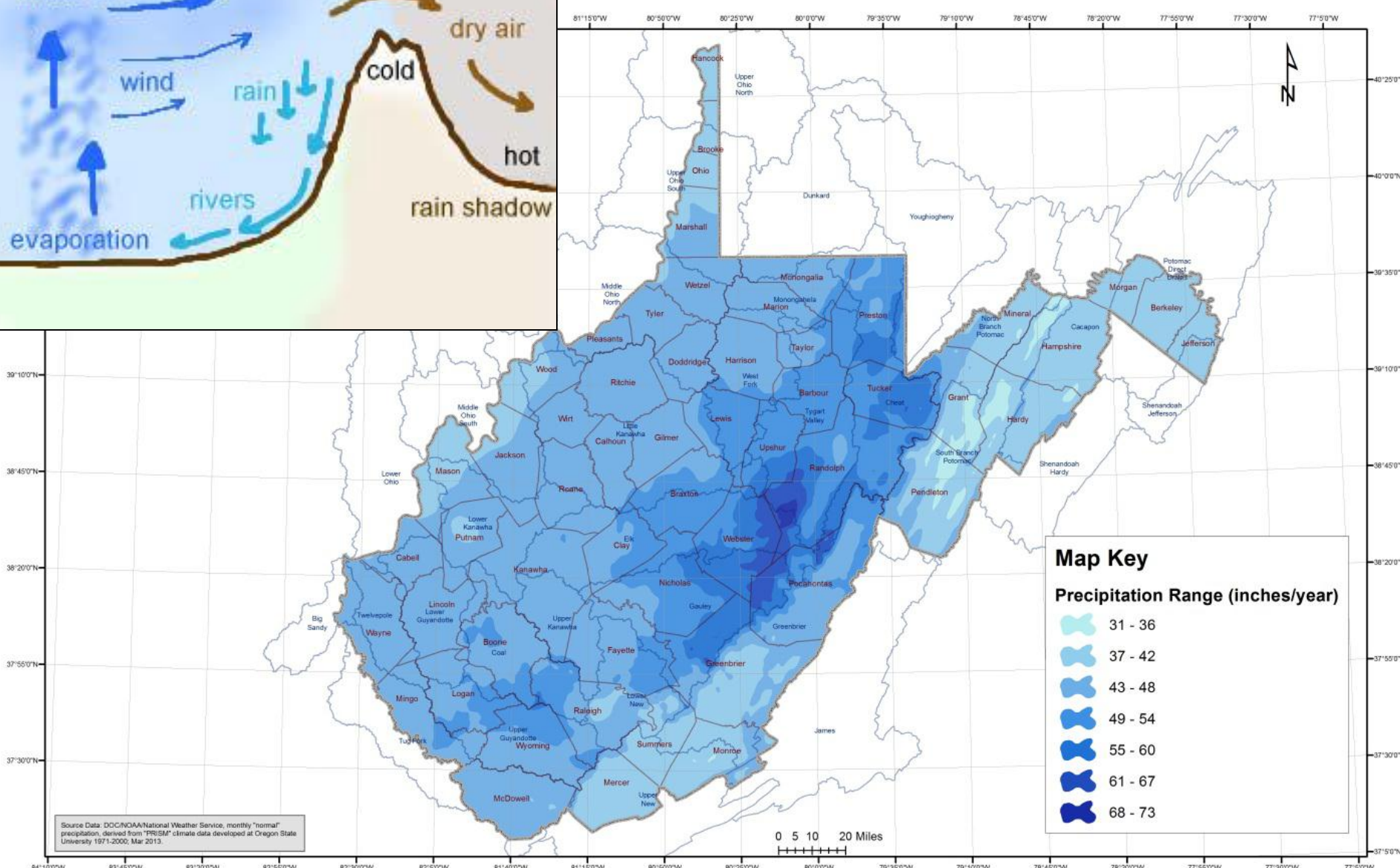
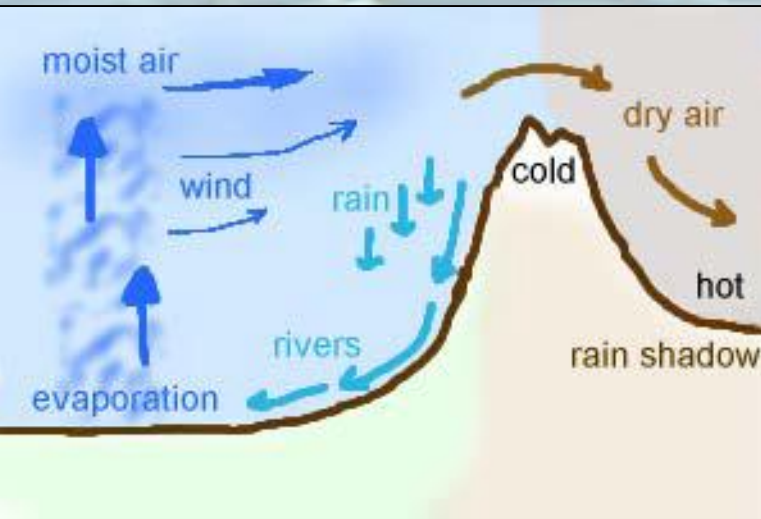




# Our Mission Statement is straight from the Act

**The WV Water Resources Protection and Management Act identified the need for the protection and conservation of our states water resources. It recognizes that a comprehensive assessment of the availability and use of our states water will benefit the citizens of West Virginia.**

# 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.

0 5 10 20 Miles



# West Virginia Water Facts

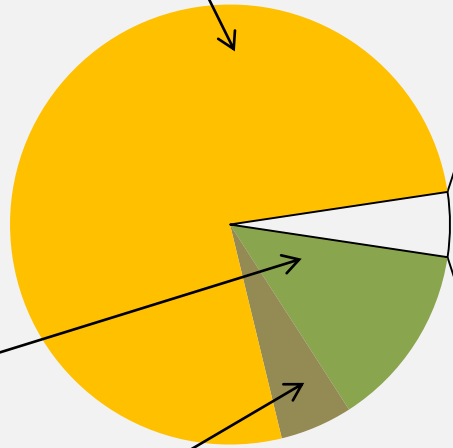
- 19.32 trillion gallons of precipitation – based on 44 in/year
- The record precipitation event in West Virginia is 19.5” of rain in 2 hours and 10 minutes at Rockport in July of 1889 (Our Probable Max Precipitation PMP)
- Maximum storage of dams/lakes - 1.07 trillion gallons
- Estimated mine pool storage - 1.48 trillion gallons
- Large Quantity Users, (excluding hydro-electric) withdraw ~ 978 Billion gallons/yr
- Only ~6% or 59 billion gallons of LQU water is consumed
- We have 54,961 total stream miles in our state
- We have ~ 42 billion gallons per day of available water in our rivers and streams

# West Virginia

## Water Use 2014 in Gallons (Minus Hydroelectric)

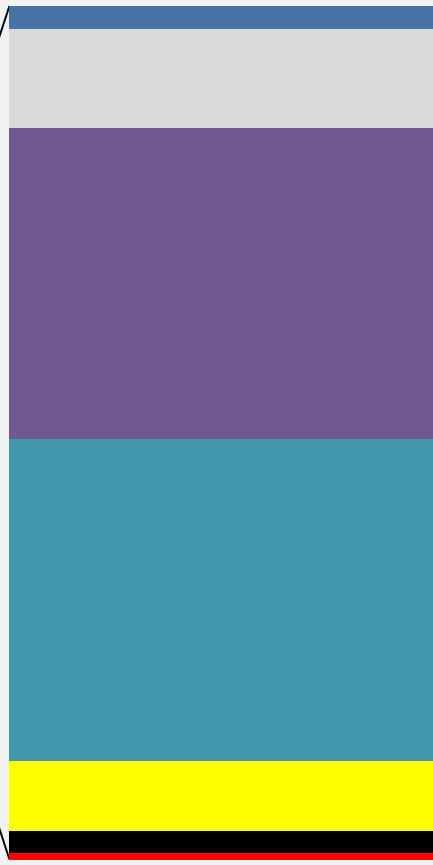
Total amount withdrawn is ~ 978 Billion gallons.

Thermoelectric 746 Billion



Chemical 132 Billion

Public Water Supply 52 Billion



Recreation 1.3 Billion

Agriculture / Aquaculture 5.4 Billion

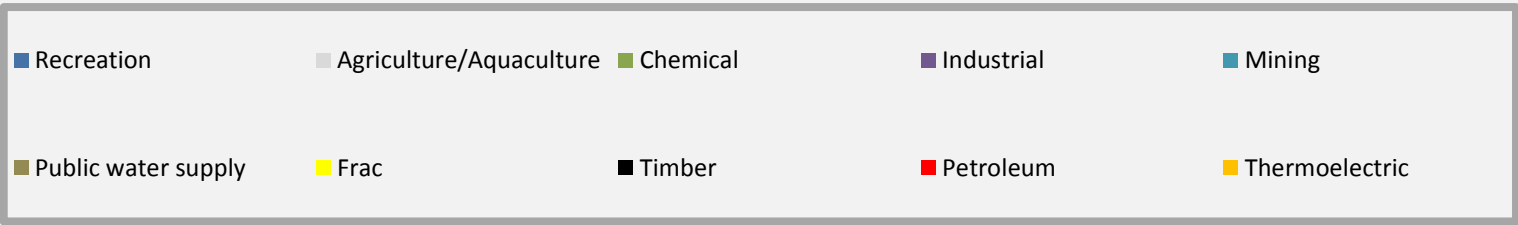
Industrial 17 Billion

Mining 17.5 Billion

Petroleum 332 Million

Frac 3.8 Billion

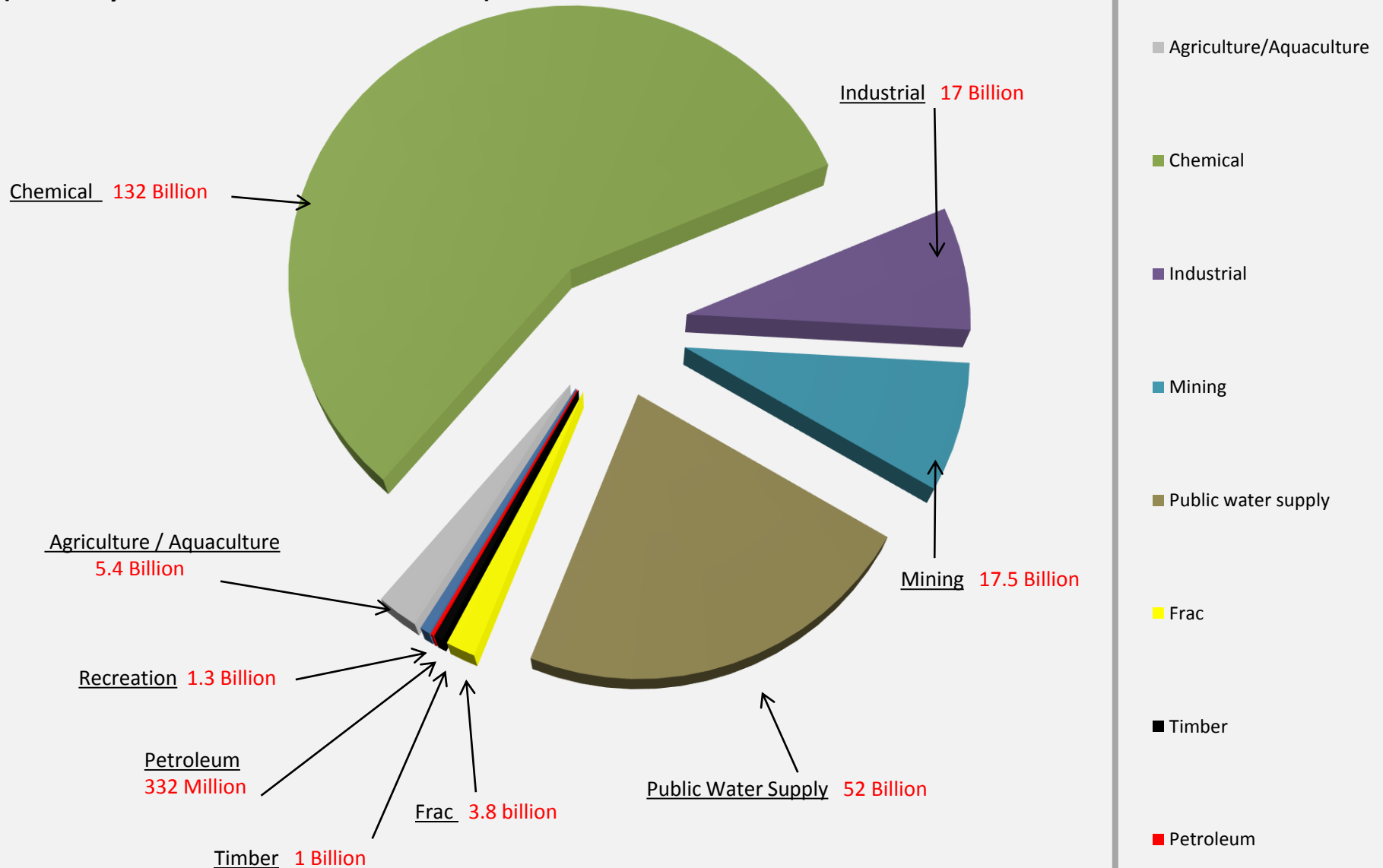
Timber 1 Billion



# West Virginia

## Water Use 2014 in Gallons

(Minus Hydroelectric and Thermoelectric)



# 2014 WV Bottled Water in Gal/year



• BERKELEY CLUB BEVERAGES INC.	4,168,800
• SWEET SPRINGS VALLEY WATER COMPANY	1,700,000
• GREEN ACRES REGIONAL CENTER INC	800,000
• UNITED DAIRY, INC. (CHARLESTON)	475,000
• WEST VIRGINIA PRIDE OF THE MOUNTAINS CO	200,000
• CAPON SPRINGS & FARMS, INC.	16,000
• TYLER MOUNTAIN WATER COMPANY, INC (now bottled in Oakland, PA)	0
• ALLEGHENY LODGE ENTERPRISES, LLC	Closed

---

**Total 7,359,800**



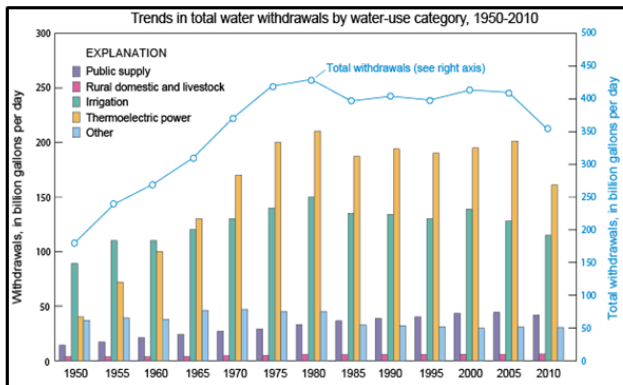
# 2014 LQU Survey Report

## Trends in Water Reporting

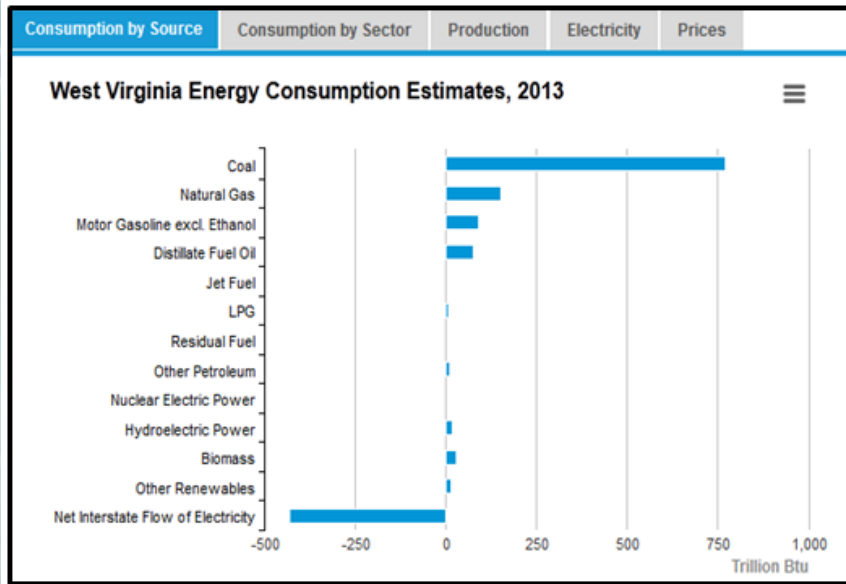
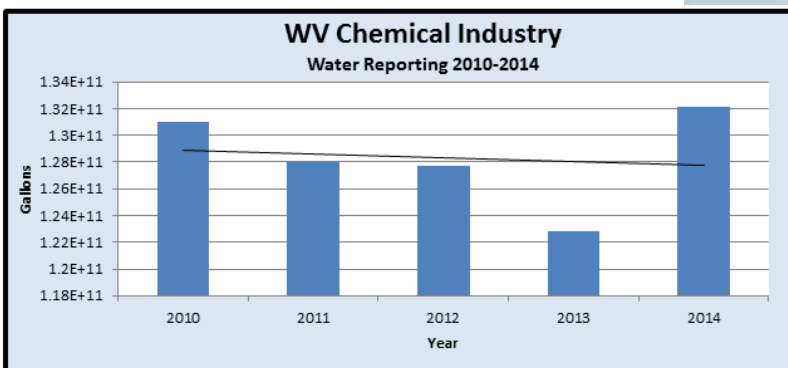
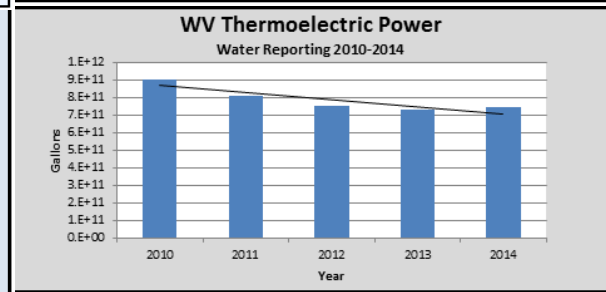
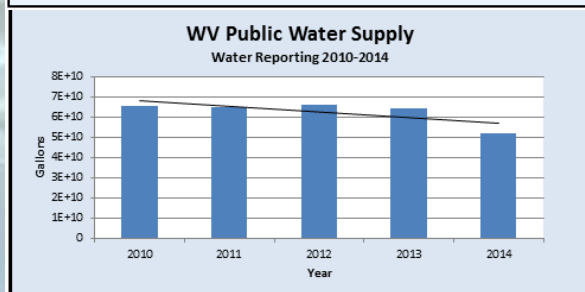
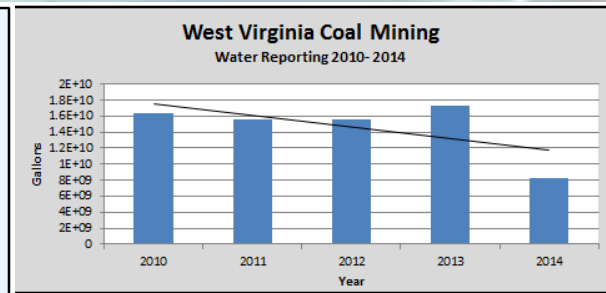
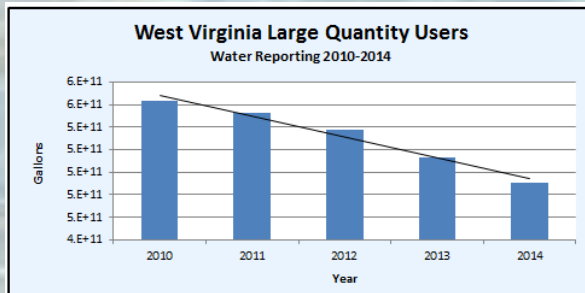
WV Department of Environmental Protection

Division of Water and Waste Management  
Water Use Section

The United States Geological Survey (USGS) has kept trends of national water use since 1950. Since the early part of the new century overall water use in the United States has declined. In 1980 water use peaked in the United States, but then started to decrease a bit, possibly due to the Nation making more use of water-conservation measures.



Almost all of the freshwater used in the United States comes from surface water, only 25% comes from groundwater, the largest user of surface water is the thermoelectric power industry (excluding once through hydroelectric facilities). The public-supply sector was the only water-use category that increased continually since 1950. (<http://water.usgs.gov/watuse/wutrends.html>)



[http://www.wvcommerce.org/energy/renewable\\_energy/hydro.aspx](http://www.wvcommerce.org/energy/renewable_energy/hydro.aspx)

# Searching for the New LQU's

## 300,000 gallons per 30 days

121 Golf Courses

318 Nursing Homes

66 Mobile Home Parks

199 Public Water Supplies

162 Campgrounds

55 Jails

25 College & University

9 Resorts

88 Parks

55 Courthouses

107 Cemeteries

85 Nurseries

151 Lumber Facilities

7 Paper Manufacturers

2 Ammunition Manufacturers

314 Concrete Producers

12 Meat Processors

25 Furniture Makers

20 Highway Rest Stops

Total quantity of water withdrawn each month must now be reported annually!

# Consumptive Use

West Virginia Department of Environmental Protection

Large Quantity User's (LQU) 2014

Water Use Section



*Procedure:*

## Coefficient Method by SIC Code

(USGS, Scientific Investigations Report 2009, <http://pubs.er.usgs.gov/publication/sir20095096>)



# What is 100% Consumptive Use?



*“Consumptive withdrawal” means any withdrawal of water which returns less water to the water body than is withdrawn.*



# 2014 Consumptive Use Totals

Water use category	Total gallons of water withdrawn in 2014	Consumptive use coefficient	Quantity of water consumed
Agriculture/Aquaculture	5,400,000,000	0.12	648,000,000
Chemical	132,000,000,000	0.2	26,400,000,000
<u>Frac</u> Water	3,800,000,000	1	3,800,000,000
Industrial	17,000,000,000	0.13	2,210,000,000
Mining	17,500,000,000	0.17	2,975,000,000
Petroleum	332,000,000	0.27	89,640,000
Public Water Supply	52,000,000,000	0.18	9,360,000,000
Recreation	1,300,000,000	0.1	130,000,000
Thermoelectric	746,000,000,000	0.03	22,380,000,000
Timber	1,000,000,000	0.25	250,000,000

For the purposes of this study a coefficient of 3% was used for thermoelectric power as provided by the USGS. A new national USGS study of thermoelectric power plants consumptive water use has been initiated to verify this data.



# Consumptive Use

State of West Virginia 2014

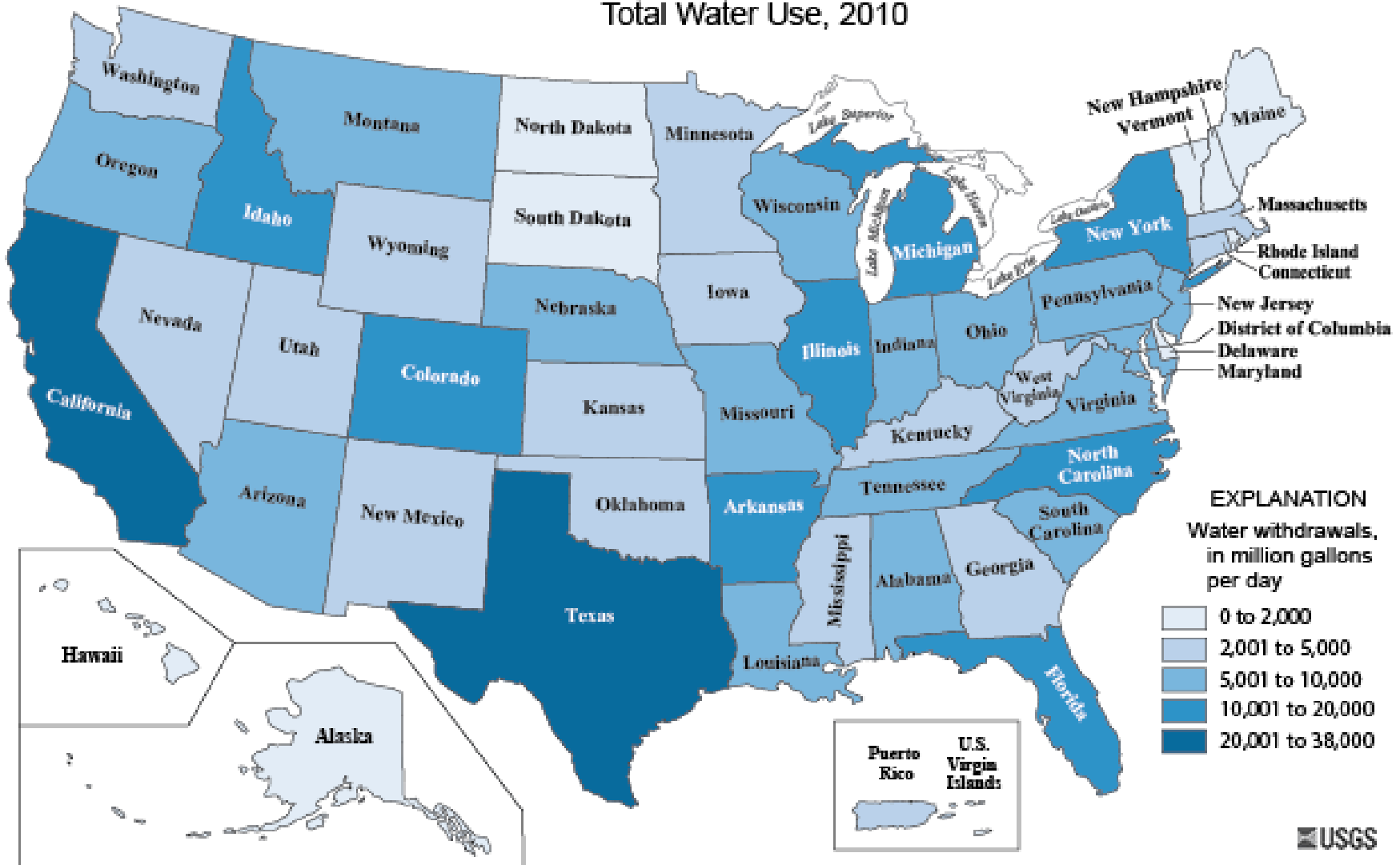


<b>Total Gallons of Water Withdrawn in 2014</b>	<b>976,332,000,000</b>
<b>Total Gallons of Water Consumed in 2014</b>	<b>68,242,640,000</b>
<b>Percent Consumptive</b>	<b>6.99%</b>



# Total Countrywide Water Use

Total Water Use, 2010



# WVWRMP Mapping Tool

Google search: wvwaterplan and click the Blue Button

The screenshot shows the website for the West Virginia Department of Environmental Protection (DEP). At the top, there is a navigation bar with the DEP logo and the text "west virginia department of environmental protection - Promoting a Healthy Environment". Below this is a search bar labeled "Search WV DEP". The main content area is titled "West Virginia Water Resources Management Plan" and includes a welcome message and a link to the mapping tool. A sidebar on the left contains a list of links: "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".

west virginia State Agency Directory | Online Services Search WV DEP

west virginia department of environmental protection  
- Promoting a Healthy Environment

DEP Offices | Agency History | News | Outlook Web Access | Text size A A A

Home > Water and Waste Management > Water Use Section > WV Water Resources Management Plan

### West Virginia Water Resources Management Plan

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.

Please click the button below to proceed to the mapping tool:

**WV Water Resources Management Plan Mapping Tool**

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.*

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
Helpful Links

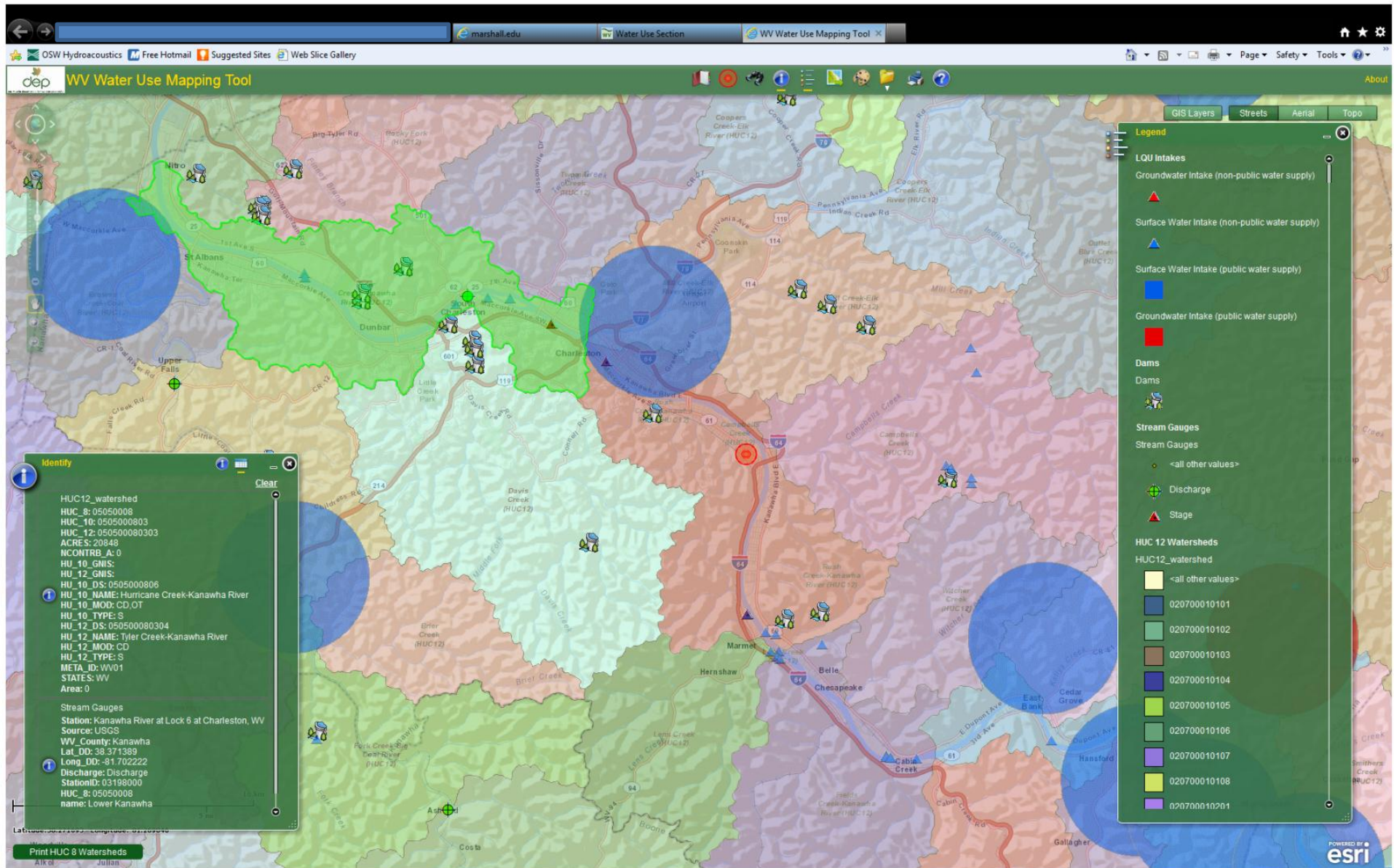
Filetype: PDF (45 MB)

Link to Watershed Maps

Filetype: PDF (30 MB)

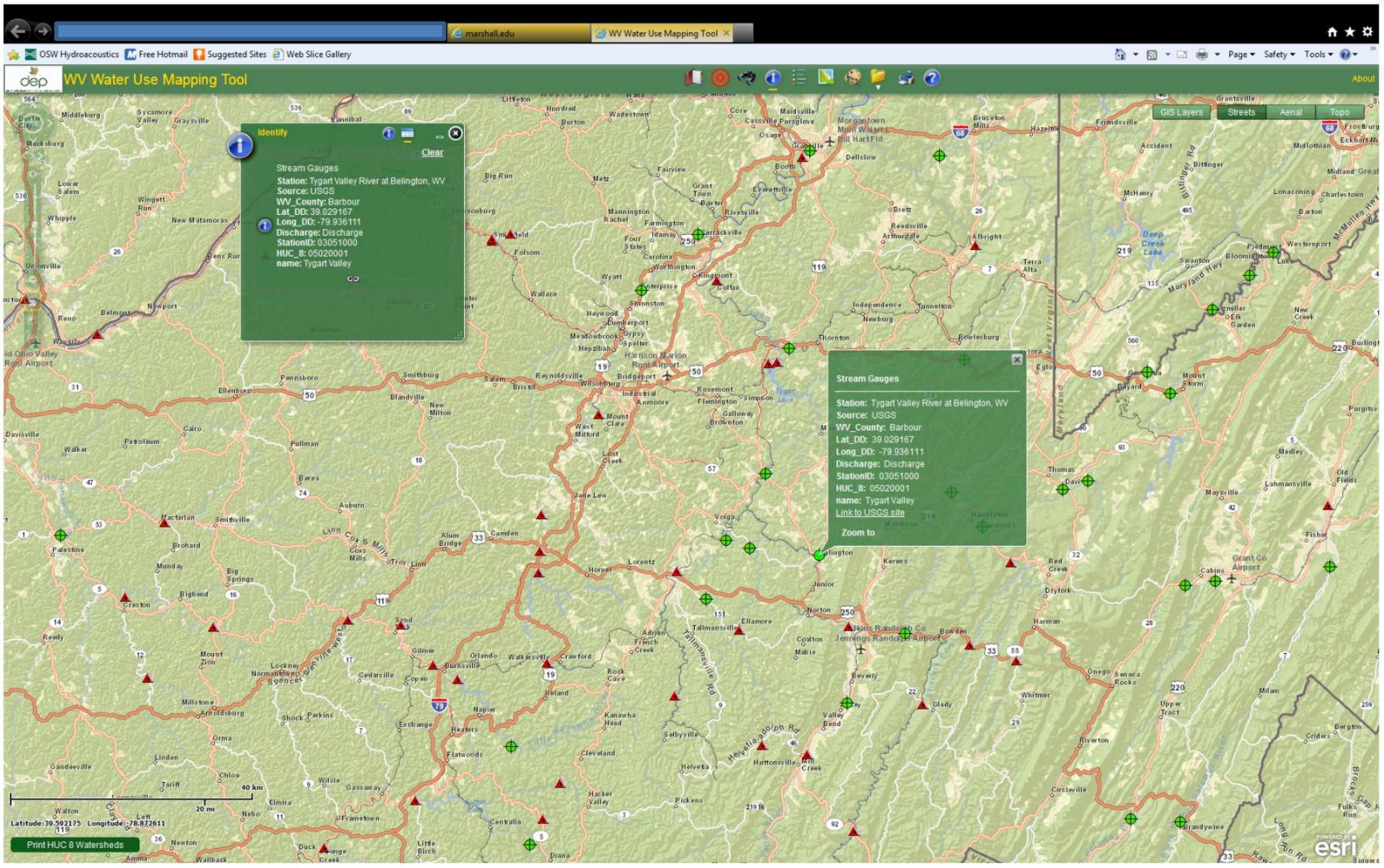


# Overlap multiple GIS Layers





# Stream Gauge Layers



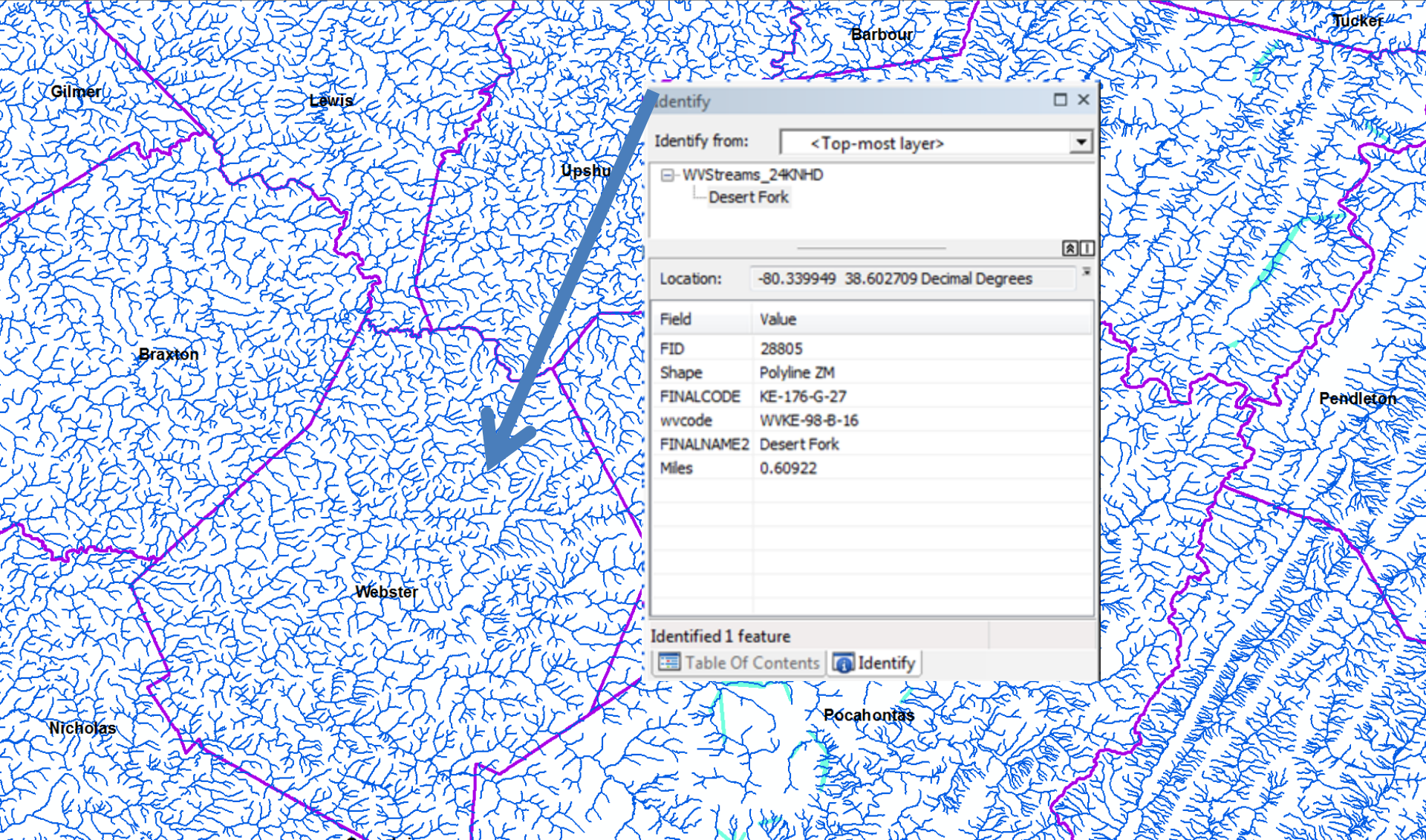
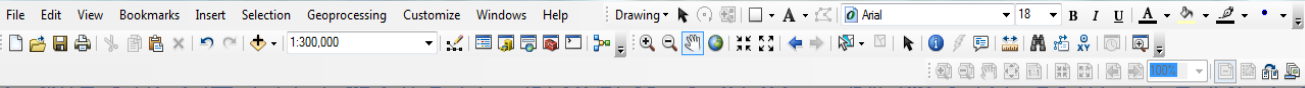


[Climate\\_Features](#)  
[Climate\\_Features.zip](#)  
[County](#)  
[County.zip](#)  
[Dams](#)  
[Dams.zip](#)  
[Demographics](#)  
[Demographics.zip](#)  
[EcoRegions](#)  
[EcoRegions.zip](#)  
[Geology\\_Type](#)  
[Geology\\_Type.zip](#)  
[Groundwater](#)  
[Groundwater.zip](#)  
[Groundwater\\_Monitoring](#)  
[Groundwater\\_Monitoring.zip](#)  
[Industrial](#)  
[Industrial.zip](#)  
[Land\\_Features](#)  
[Landcover](#)  
[Landcover.zip](#)  
[Layouts](#)  
[LOU\\_intakes\\_buffer](#)  
[LOU\\_intakes\\_buffer.zip](#)  
[New\\_folder](#)  
[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](#)  
[Watershed\\_HUC08.zip](#)  
[Watershed\\_HUC10](#)  
[Watershed\\_HUC10.zip](#)  
[Watershed\\_HUC12](#)  
[Watershed\\_HUC12.zip](#)  
[Wetlands](#)  
[Wetlands.zip](#)  
[WV\\_Watersheds](#)

# New NHD24 Stream Layer



Identify

Identify from: <Top-most layer>

- WVStreams\_240NHD
  - Desert Fork

Location: -80.339949 38.602709 Decimal Degrees

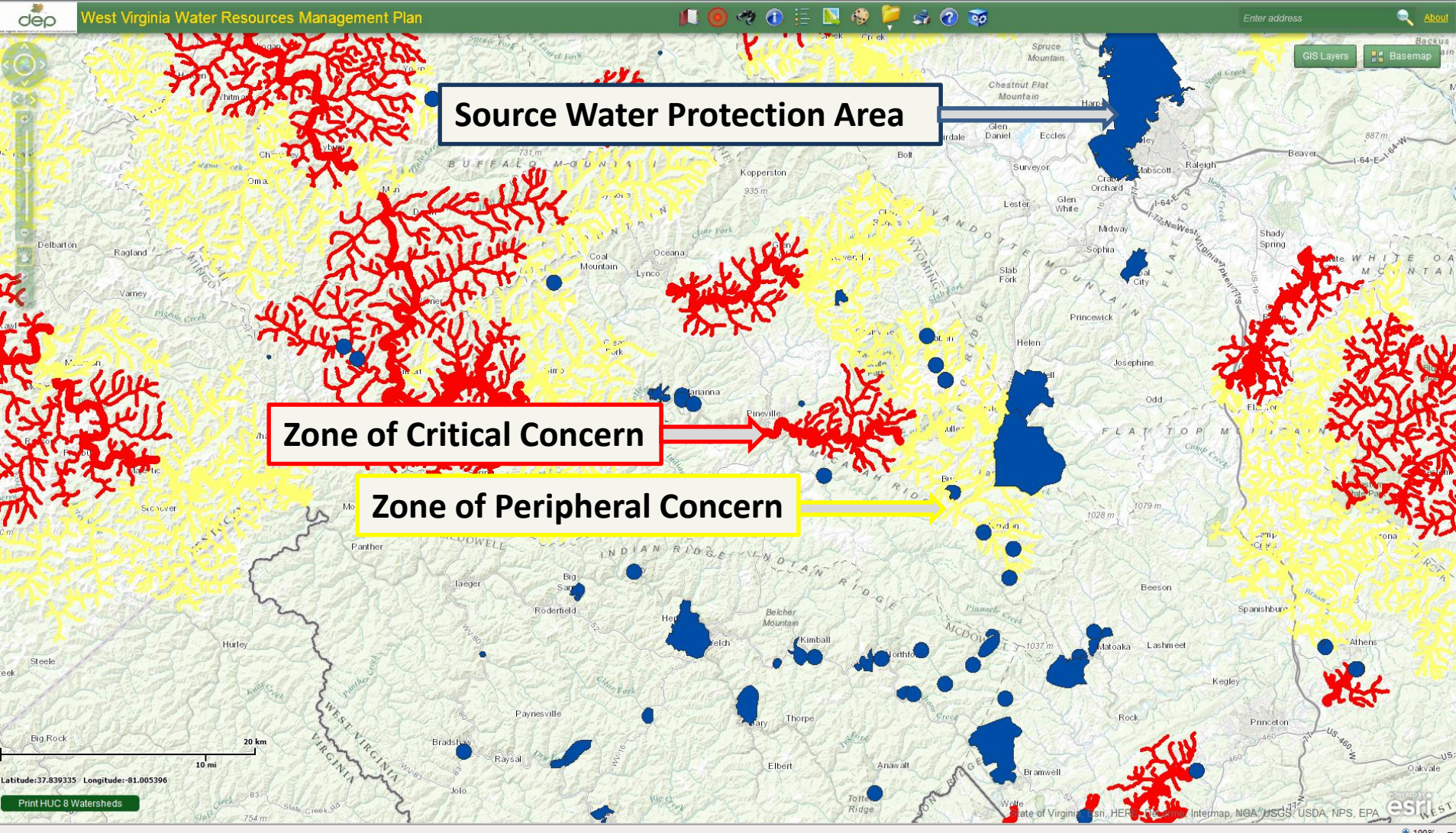
Field	Value
FID	28805
Shape	Polyline ZM
FINALCODE	KE-176-G-27
wvcode	WVKE-98-B-16
FINALNAME2	Desert Fork
Miles	0.60922

Identified 1 feature

Table Of Contents Identify



# DHHR ZCC, ZPC and SWPA Layer





Aboveground Storage Tanks (ASTs)



Overview of the Aboveground Storage Tank Act and its Implementation

Senate Bill 373, containing the Aboveground Storage Tank Act §22-30 and the Public Water Supply Protection Act §22-31 was approved by the 2014 Legislature and signed into law by Governor Earl Ray Tomblin on April 1, 2014. The law officially took effect on June 6, 2014, 90 days from its date of passage on March 8, 2014. The bill requires an inventory and registration of aboveground storage tanks. The bill also requires development of a variety of aboveground storage tank regulations for consideration in the 2015 Legislative session.

DEP is still accepting online AST registrations via the **Electronic Submission System (ESS)**. The registration process includes questions about tank size, contents, construction, age and location. To assist in the registration process, there is a comprehensive AST Registration User's Guide available at the link below or on the ESS sign-up/login page that provides screen-by-screen instructions. DEP employees also are on hand to assist tank owners who are subject to the requirements of a newly enacted law intended to help prevent future leaks such as the one on Jan. 9 that contaminated the drinking water of approximately 300,000 West Virginia residents.

- [See if you need to register your AST ->](#)
- [See sample of electronic registration form ->](#)
- [See the Registration User's Guide ->](#)
- [Sign up for a login ID or log in to start registering ->](#)

On Oct. 1, 2014, DEP hosted a working meeting to discuss the rough draft of the AST Emergency Rule. This meeting allowed DEP to receive input and ideas on ways to ensure the rule fulfills its intended purpose.

[See the PowerPoint presentations from the meeting ->](#)

The coming year will be a busy one for DEP staff as they work to implement the new program. Please check back frequently as this website will contain the latest information available on SB 373's implementation.

Featured Links

- [Enrolled Final Version Senate Bill No. 373](#)
- [Industry Standards, Organizations, & Other Resources](#)
- [Interim Spill Prevention Response Plan Guidance](#)
- [Interim Tank Certification Guidance](#)
- [Interim Tank Closure Guidance](#)
- [Required Signage](#)
- [Frequently Asked Questions](#)
- [Definitions](#)
- [Public Input Received for AST Rulemaking](#)
- [AST Contacts](#)
- [Hazardous Substances as Defined in Section 101\(14\) of CERCLA](#)

Learn more about the **Final 47 CSR 62 Interpretive Rule** filed on Oct. 21, 2014, after the comment period. See comments and responses; the public hearing transcript; and the final rule here ->

Learn more about the **Proposed Rule 47 CSR 63 - Aboveground Storage Tanks**, filed on Dec. 22, 2014 ->

[WV Rural Water Seminar Schedule for Source Water Protection Plans](#)

Important Dates

- June 6, 2014 - Statute becomes effective
- June 10, 2014 - Registration period opening
- Sept. 1, 2014 - NPDES General Permit holders having ASTs within the zone of critical concern must have applied for an NPDES Individual Permit (WVa. Code §22-31-9)
- Oct. 1, 2014 - All tanks must be registered (WVa. Code §22-30-4)
- Dec. 3, 2014 - Spill Prevention Response Plan Submittals due (WVa. Code §22-30-9)
- Jan. 1, 2015 - Inspections and certifications of all ASTs by a qualified person due (WVa. Code §22-30-6)

If you also want to learn about the **Underground Storage Tank Program** [click here](#)

- INDEX-alphabetic
- HOT TOPICS
- Aboveground Storage Tanks
  - Enrolled Final Version Senate Bill No. 373
  - Industry Standards, Organizations & Other Resources
  - Interim Spill Prevention Response Plan Guidance for ASTs
  - Submitting a Spill Plan or Spill Plan Certification
  - Interim Guidance for Certification of Annual Inspection of AST System
  - Submitting an Inspection Certification
  - Interim Tank Closure Guidance
  - Required Signage
  - Frequently Asked Questions
  - Definitions
  - Public Input Received for AST Rulemaking
  - AST Contacts
  - Final 47CSR62 Interpretive Rule
  - Proposed Rule 47 CSR 63
  - Working Meeting PowerPoint Presentations
  - Inspection and Enforcement
  - Resources and Education for public
  - Permitting
  - Regulations
  - Data
  - Water Use Section
  - Watershed Management
  - Programs
  - Contact information

# DEP AST WEB PAGE

Find out more about reporting timelines, forms and the DEP's Final Interpretive Rule



# Large Quantity Water User Reporting Requirements for the Horizontal Gas Well Drilling Industry

- \* Most Oil & Gas operators are already familiar with the LQU reporting requirements and regularly submit data to the DEP's frac-water reporting database.
- \* *HOWEVER, the frac-water reporting system needs modernized*
  - \* *we are creating a new point of entry and database for online submission.*



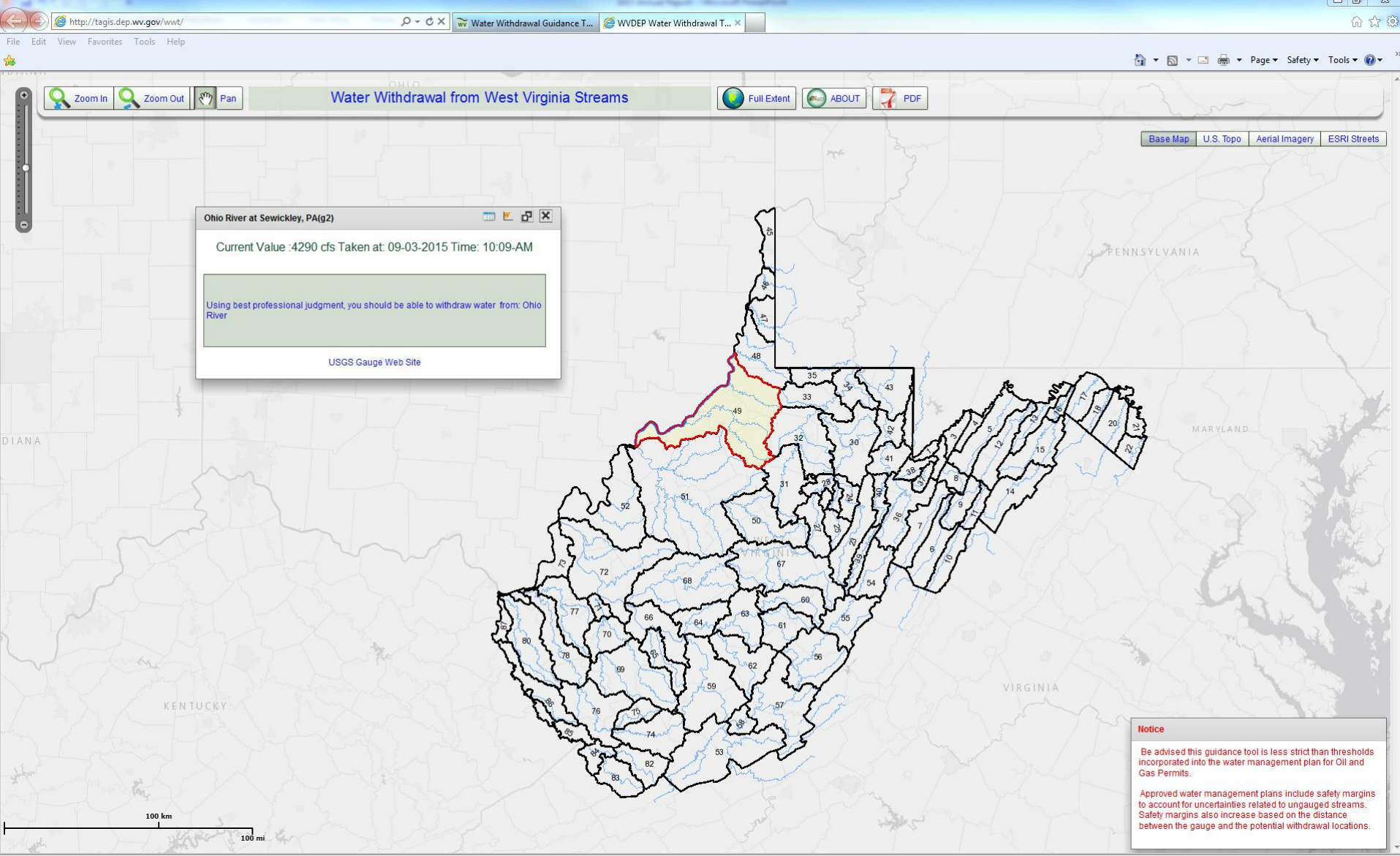
# Why a new database?

- \* Capture actual water withdrawal totals from each unique withdrawal location
- \* Alleviate redundancy to increase reporting compliance. O&G operators are already required to submit a lot of the required data to [fracfocus.org](http://fracfocus.org)

# When will the new system take effect?

- \* We are currently testing a beta version in-house
- \* Our tentative date to go online is January, 2016
- \* In the meantime, users will continue to submit water use data to the existing frac water reporting database

# Water Withdrawal Tool





# Cooperators Contributing to Stream Gage Network Costs

Agency	Support Dollars
DNR	12,500
Independent Cities	25,000
DOH	65,000
WVCA	177,000
DEP	218,000

Plus 110,000 Federal match money by the USGS and additional money from some private investors.

There will likely be a 3 percent increase in 2017

# Gas Companies Contributing For Past 5 Years

West Virginia Department of Environmental Protection

Division of Waste Water Management

U.S. Geological Survey - West Virginia Water Science Center

Energy Company Flow Monitoring Program

FY 2015

Site Number	Station Name	Collection Type	Cooperator Cost	Other Funding	Annual Cost	Comments
03052120	BUCKHANNON RIVER AT ALTON, WV	Discharge	\$16,000	\$0	\$16,000	CNX Gas
03111955	WHEELING CREEK NEAR MAJORSVILLE, WV	Discharge	\$16,000	\$0	\$16,000	Consol Energy
03188900	LAUREL CREEK NEAR FENWICK, WV	Discharge	\$16,000	\$0	\$16,000	BRC Operating Company LLC
		Total	\$48,000	\$0	\$48,000	

# DEP Water Use Sole Supporter for the GW Monitoring Network

West Virginia Department of Environmental Protection Division of Waste Water Management U.S. Geological Survey - West Virginia Water Science Center Groundwater Monitoring Program FY 2015						
Site Number	Station Name	Collection Type	Cooperator Cost	USGS Matching Cost	Other Funding	Annual Cost
372322081241501	Mcd-0204	Water Level	\$2,970	\$1,900	\$0	\$4,870
373839081255201	Wyo-0148	Water Level	\$1,434	\$1,100	\$2,336	\$4,870 *
380653080155301	Poc-0256	Water Level	\$1,434	\$1,100	\$2,336	\$4,870 *
381447081393101	Kan-0946	Water Level	\$2,970	\$1,900	\$0	\$4,870
382008080292801	Web-0167	Water Level	\$2,970	\$1,900	\$0	\$4,870
382205082304501	Way-0144	Water Level	\$2,970	\$1,900	\$0	\$4,870
385849079563901	Bar-0136	Water Level	\$2,970	\$1,900	\$0	\$4,870
390333078370801	Hrd-0301	Water Level	\$2,970	\$1,900	\$0	\$4,870
391020080244101	Har-0165	Water Level	\$2,970	\$1,900	\$0	\$4,870
391308081064201	Rit-0116	Water Level	\$2,970	\$1,900	\$0	\$4,870
391920078032201	Ber-0840	Water Level	\$2,970	\$1,900	\$0	\$4,870
392200078532001	Min-0173	Water Level	\$2,970	\$1,900	\$0	\$4,870
392725077582401	Ber-0445	Water Level	\$2,970	\$1,900	\$0	\$4,870
392757077501001	Jef-0797	Water Level	\$2,970	\$1,900	\$0	\$4,870
393814079484601	Mng-0585	Water Level	\$2,970	\$1,900	\$0	\$4,870
401216080362703	Brk-0066	Water Level	\$1,013	\$0	\$3,857	\$4,870 *
Total			\$42,491	\$26,900	\$8,529	\$77,920
* Other funding all or partially provided by the USGS National groundwater monitoring program						



# Stream Gage Funding

- All of our water resource science and web tools are dependent on the USGS Stream Gaging network.
- It costs about 1.3 million per year to fully fund our states stream gage, groundwater and water quality network.
- The cost is currently supported by five state agencies, the ACoE, the USGS and some private industries.
- The WRPMA requires any state agency to notify this Commission if they are reducing their supporting funds:
  - §22-26-3(p) *Should a cooperating state agency become unable to maintain its contribution level, it should notify the USGS and the commission of its inability to continue funding for the subsequent federal fiscal year by July 1 in order to allow for the possible identification of alternative funding resources.*


## Other Projects and Studies Underway

- **Geophysical Well Logging - Groundwater Aquifer Study**
- **Mine Pool Study – Location, Quantity, Quality and Sustainability**
- **Source Water Protection and Stream Time of Travel Study**
- **Aboveground Storage Tanks ZCC, ZPC and SWPA's**
- **Water Conservation Award in 2016**



# 2015 WV Annual Water Conference



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION 

## West Virginia Water Resources Conference

In conjunction with  
The WVRWA 30th Annual Training and Technical Conference


**Water Use Section**




Brian A. Carr, P.G.  
brian.a.carr@wv.gov  
Extension 1757



Mark Collins  
Mark.Collins@wv.gov  
Extension 1230



Carson Wright  
Carson.A.Wright@wv.gov  
Extension 1809



Fini Bya  
Fini.B.Bya@wv.gov  
Extension 1644



Robert D. Biller  
Robert.D.Biller@wv.gov  
Extension 1479


**Meet the Water Use Section**

The West Virginia Water Resources Protection and Management Act identifies the need for the protection and conservation of our state's water resources. It recognizes that a comprehensive assessment and statewide management plan for water resources will benefit the citizens of West Virginia. West Virginia Code Chapter 22, Article 26.

In support of this, the Water Use Section of the DEP's Division of Water and Waste Management was formed. We have many responsibilities. This meeting focuses on the Statewide Water Management Plan for West Virginia, Legislation, Resource Mapping, Large Quantity Users, Flood and Drought, and Marcellus Shale.

**Here are the group members:**

Brian A. Carr, P.G., Program Manager  
Mark Collins, Eng., Resources Analyst  
Carson Wright, Hydrologist  
Robert D. Biller, LQU Coordinator  
Fini Bya, GIS Coordinator



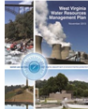
**Water Resources Management Plan**

§22-26-8. State Water Resources Management Plan; powers and duty of secretary.

(a) The Secretary of the Department of Environmental Protection shall oversee the development of a State Water Resources Management Plan to be completed no later than the thirtieth day of November, two thousand thirteen.

The plan shall be reviewed and revised as needed after its initial adoption. The plan was developed with the cooperation and involvement of local and state agencies with regulatory, research or other functions relating to water resources.

To view the "West Virginia Water Resources Management Plan", the "West Virginia Watershed Atlas", or the "West Virginia Watersheds: A Closer Look" please go to the following website:  
<http://dep.wv.gov/WVWaterPlan>





# QUESTIONS ?



WV department of environmental protection

-Promoting a healthy environment