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:
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Program Manager
Water Use Section

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.
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

Map Key
Precipitation Range (inches/year)
- 31 - 36
- 37 - 42
- 43 - 48
- 49 - 54
- 55 - 60
- 61 - 67
- 68 - 73

Source Data: NWS/CPAC/Meteorological Weather Service, monthly "Normals" Precipitation, dataset from "weather-Bureau data developed at Virginia Tech University, July 2005, Data 2004"
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)

- Thermolectric: 746 Billion
- Chemical: 132 Billion
- Public Water Supply: 52 Billion
- Agriculture/Aquaculture: 5.4 Billion
- Petroleum: 332 Million
- Timber: 1 Billion
- Frac: 3.8 Billion
- Recreation: 1.3 Billion
- Industrial: 17 Billion
- Mining: 17.5 Billion
- Total amount withdrawn is ~ 978 Billion gallons.
West Virginia Water Use 2014 in Gallons (Minus Hydroelectric and Thermoelectric)

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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 0 (now bottled in Oakland, PA)
- ALLEGHENY LODGE ENTERPRISES, LLC Closed

Total 7,359,800
Trends in Water Reporting

The United States Geological Survey (USGS) has kept trends of national water use since 1950. Since the early part of the century, the overall water use in the United States has declined. In 1980, water use peaked in the United States, but since then, it has decreased by about 30%, 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 those using hydropower facilities). The public supply sector was the only water-use category that increased annually since 1950.

http://www.wvcommerce.org/energy/renewable_energy/hydro.aspx
Searching for the New LQU’s
300,000 gallons per 30 days

<table>
<thead>
<tr>
<th>121 Golf Courses</th>
<th>55 Courthouses</th>
</tr>
</thead>
<tbody>
<tr>
<td>318 Nursing Homes</td>
<td>107 Cemeteries</td>
</tr>
<tr>
<td>66 Mobile Home Parks</td>
<td>85 Nurseries</td>
</tr>
<tr>
<td>199 Public Water Supplies</td>
<td>151 Lumber Facilities</td>
</tr>
<tr>
<td>162 Campgrounds</td>
<td>7 Paper Manufacturers</td>
</tr>
<tr>
<td>55 Jails</td>
<td>2 Ammunition Manufacturers</td>
</tr>
<tr>
<td>25 College &amp; University</td>
<td>314 Concrete Producers</td>
</tr>
<tr>
<td>9 Resorts</td>
<td>12 Meat Processors</td>
</tr>
<tr>
<td>88 Parks</td>
<td>25 Furniture Makers</td>
</tr>
<tr>
<td></td>
<td>20 Highway Rest Stops</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Gallons of Water Withdrawn in 2014</td>
<td>976,332,000,000</td>
</tr>
<tr>
<td>Total Gallons of Water Consumed in 2014</td>
<td>68,242,640,000</td>
</tr>
<tr>
<td>Percent Consumptive</td>
<td>6.99%</td>
</tr>
</tbody>
</table>
WVWRMP Mapping Tool

Google search: wvwaterplan and click the Blue Button
Overlap multiple GIS Layers
Downloadable shape files are available for individuals, companies, consultants and economic development professionals.
DHHR ZCC, ZPC and SWPA Layer

Source Water Protection Area

Zone of Critical Concern

Zone of Peripheral Concern
DEP AST WEB PAGE

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

<table>
<thead>
<tr>
<th>Agency</th>
<th>Support Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNR</td>
<td>12,500</td>
</tr>
<tr>
<td>Independent Cities</td>
<td>25,000</td>
</tr>
<tr>
<td>DOH</td>
<td>65,000</td>
</tr>
<tr>
<td>WVCA</td>
<td>177,000</td>
</tr>
<tr>
<td>DEP</td>
<td>218,000</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Station Name</th>
<th>Collection Type</th>
<th>Cooperator Cost</th>
<th>Other Funding</th>
<th>Annual Cost</th>
<th>Comments</th>
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<tbody>
<tr>
<td>03052120</td>
<td>BUCKHANNON RIVER AT ALTON, WV</td>
<td>Discharge</td>
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<td>$0</td>
<td>$16,000</td>
<td>CNX Gas</td>
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<td>03111955</td>
<td>WHEELING CREEK NEAR MAJORSVILLE, WV</td>
<td>Discharge</td>
<td>$16,000</td>
<td>$0</td>
<td>$16,000</td>
<td>Consol Energy</td>
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<tr>
<td>03188900</td>
<td>LAUREL CREEK NEAR FENWICK, WV</td>
<td>Discharge</td>
<td>$16,000</td>
<td>$0</td>
<td>$16,000</td>
<td>BRC Operating Company LLC</td>
</tr>
</tbody>
</table>

**Total** | **$48,000** | **$0** | **$48,000** |
**DEP Water Use Sole Supporter for the GW Monitoring Network**

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Station Name</th>
<th>Collection Type</th>
<th>Cooperator Cost</th>
<th>USGS Matching Cost</th>
<th>Other Funding</th>
<th>Annual Cost</th>
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<tbody>
<tr>
<td>372322081241501</td>
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<td>Water Level</td>
<td>$1,434</td>
<td>$1,100</td>
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<td>$4,870 *</td>
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<td>Poc-0256</td>
<td>Water Level</td>
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<td>$1,100</td>
<td>$2,336</td>
<td>$4,870 *</td>
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<td>Kan-0946</td>
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<td>$2,970</td>
<td>$1,900</td>
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<tr>
<td>382008080292801</td>
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<tr>
<td>401216080362703</td>
<td>Brk-0066</td>
<td>Water Level</td>
<td>$1,013</td>
<td>$0</td>
<td>$3,857</td>
<td>$4,870 *</td>
</tr>
</tbody>
</table>

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
QUESTIONS?

WV department of environmental protection
-Promoting a healthy environment