

Water Withdrawal and Use

[Water Supply Workgroup](#)

The 2009 State Water Plan Update included a comprehensive treatise on Water Withdrawal and Use Management in Pennsylvania that described the common law and statutory basis for water allocations, and the roles of the federal, state, and local governments and compact commissions on water withdrawals and use. From this, the 2009 State Water Plan Update provided three primary recommendations centered on the:

- Advancement of water use registration and reporting
- Development of water use projections and water use trends
- Development of recommendations as to whether and how Pennsylvania’s water rights system might be improved

For the 2022 [State Water Plan](#) Update, the Water Supply Workgroup of the statewide committee looked at the 2009 State Water Plan Update to ascertain which of the recommendations may be appropriately updated, to consider how water supply needs and priorities have evolved since 2009, and to offer new recommendations.

Of the three 2009 recommendations, DEP accomplished the development and implementation of water use registration regulations and an implementation program. From these registrations and subsequent periodic reporting, DEP created [a comprehensive database and statistical information on water use in Pennsylvania](#)¹ that is accessible to the public and other agencies for water planning purposes. This data is important in serving to inform the development of trends in water use over time.

[Since the 2009 Update, total water withdrawals within the state have been declining, primarily due to the reduced demand from thermoelectric power generating facilities. Water withdrawn for cooling of thermoelectric facilities is the commonwealth's largest sector accounting for over 60 percent of all withdrawals at 3.1 billion gallons per day \(BGD\) in 2020. This sector, specifically coal-burning electric generating facilities, has been driving the overall decline in Pennsylvania. The next two largest water use sectors are public water supply and industrial. These two sectors account for an additional 38 percent for a total of 98 percent of all reported withdrawals in the commonwealth from these three water use sectors. Public water supply use has been relatively steady at 1.3 BGD, while industrial use has been averaging 0.7 BGD. This information is further summarized in the Water Use and Planning section of the updated State Water Plan Atlas](#)².

[The Susquehanna River Basin Commission \(SRBC\) and Delaware River Basin Commission \(DRBC\) had completed reports within their respective basins, including projected water needs. SRBC, in their](#)

¹ [DEP Water Use Reports webpage](#)
www.dep.pa.gov/DataandTools/Reports/Pages/Water.aspx

² [DEP State Water Plan Digital Water Atlas](#)
[\[link to be inserted\]](#)

[Cumulative Water Use and Availability Study](#)³, projected a 10 percent increase in reported consumptive use by 2030 from 2014. Specifically, the report identified two subbasins to increase the most, Juniata (Lower Susquehanna Region) and West Branch Susquehanna (Upper/Middle Susquehanna Region), with a projected increase in reported consumptive use at 27 and 16 percent, respectively. The report states that the primary driver for the increased water use is the natural gas industry. Although, reported consumptive use in the basin for the natural gas industry declined slightly from 27.2 million gallons per day (MGD) in 2014 to 26.04 MGD in 2019.

Recent water use observations shared with the statewide committee from SRBC include the following:

- [Water use for existing power plants has been declining](#)
- [Planned natural gas power plants are encouraged to cool using air instead of water](#)
- [Public water supply requests for water use reduction at time of renewal](#)
- [Decrease in the number of natural gas wells developed, but the amount of water use per well has increased](#)
- [Slight increase in water use for agriculture but is projected to decrease in the future](#)
- [Relatively stable to slight increases in manufacturing water use](#)
- [Ski facilities asking for increased withdrawal rates to take advantage of shorter periods of snowmaking conditions](#)

[In the Delaware River region, peak water use has likely already occurred. According to a recent DRBC report titled *Water Withdrawal and Consumptive Use Estimates for the Delaware River Basin \(1990-2017\) with Projections through 2060*](#)⁴, water use trends are projected to continue to decrease by 2060, led by declines in withdrawals from thermoelectric facilities utilizing once through cooling. However, the DRBC report identifies projected increases in two subbasins (eight-digit hydrologic unit codes⁵):

- [Crosswicks-Neshaminy \(Bucks County\) for thermoelectric power, industrial and public water supply](#)
- [Lehigh \(east-central Pennsylvania\) for primarily public water supply](#)

The Water Supply Workgroup recognized that, going forward into the next planning phase of the State Water Plan, the legacy issues from the previous update should be completed. The workgroup also identified potential future activities such as evaluating potential changes to the current common law system for a more consistent and secure statutory arrangement. The workgroup envisioned that such changes in law would consider DEP's water data system to achieve a better understanding of future water demands. Additionally, the workgroup envisioned that supporting legislation would be designed to protect existing and future uses of private wells and other groundwater resources. Finally, the

³ SRBC, [Cumulative Water Use and Availability Study](https://www.srbc.net/our-work/reports-library/technical-reports/303-cumulative-water-use-availability/)
<https://www.srbc.net/our-work/reports-library/technical-reports/303-cumulative-water-use-availability/>

⁴DRBC [Water Withdrawal & Consumptive Use Estimates \(1990-2017\) & Projections Through 2060](http://www.nj.gov/drbc/programs/supply/use-demand-projections2060.html)
www.nj.gov/drbc/programs/supply/use-demand-projections2060.html

⁵ For explanation of hydrologic unit codes (HUCs), see the [USGS Hydrologic Unit Maps webpage](https://water.usgs.gov/GIS/huc.html)
<https://water.usgs.gov/GIS/huc.html>

workgroup believed it will be important to consider the effects of climate change and to plan for more resilient water supplies and improved drought and flood monitoring.

These considerations are the basis for the following 2022 State Water Plan Update recommendations.

Water Withdrawal and Use Recommendations

1. Encourage the General Assembly to protect existing and future uses of private wells and the groundwater resources upon which they rely, by enacting legislation to require proficiency-based licensing and certification of water well drillers, and to establish statewide private water well construction standards. Considering past significant adverse reactions to similar proposals, any proposed legislation should be preceded by a strategic campaign of educational outreach.
2. DEP should work with the river basin commissions, United States Geological Survey, and other partners to improve the utilization of reported water use data in projecting future demand trends and to aid in managing and assessing water supply and water availability on a watershed scale. Such efforts should include the following actions:
 - Maintain efforts to register and report withdrawals under the provisions of Pennsylvania’s Water Resources Planning Act (Act 220 of 2002) and counterpart basin commission programs, and to encourage compliance with withdrawal and consumptive use reporting programs
 - Expand the current data analytic tools (e.g., water use summaries, report viewers) to focus on consumptive use/depletions on a watershed scale
 - Prior to and during the next iteration of the State Water Plan, develop projections and trends in water withdrawal and consumptive uses by watershed
 - Prior to and during the next iteration of the State Water Plan, develop projections of the impacts of climate change on water availability by watershed
 - Explore opportunities for outreach to water supply purveyors and other self-supplied water users to focus on improved water supply planning to assure long-term, reliable supplies, including considerations of water resiliency, [and to maintain accurate flow metering and data reporting](#)
 - Reevaluate the processes for using reported data and projections to identify critical and potentially stressed or challenged watersheds and assign appropriate priority for focus on watersheds based on the degree of stress or challenge
3. The ~~Statewide Water Resources Committee~~[statewide committee](#) should work with DEP, the broad spectrum of stakeholders, and the General Assembly to evaluate the current effectiveness and shortcomings of Pennsylvania’s existing water rights and water withdrawal arrangements, and to develop recommendations for evolving those arrangements to a more consistent, secure, and holistic approach. Once shortcomings have been identified, an evaluation of programs used in other states and compact commissions should be conducted to determine if those practices may serve as recommendations for a secure and sustainable water supply statewide. Based on that process, a report developed by ~~DEP the statewide committee~~ in consultation with ~~DEP the statewide committee~~ on the relative merits of the identified options should be developed, and appropriate recommendations should be made to the General Assembly as to whether and how Pennsylvania’s water rights system might be improved and made more efficient, effective, predictable, and secure.

4. DEP should evaluate and continue to improve its drought monitoring practices and encourage proactive monitoring among public water suppliers.
 - Add targeted groundwater wells with 20-year records to the monitoring network to increase county representation
 - Seek an alternative to the Palmer Drought Severity Index, which proved unreliable for Pennsylvania in recent droughts
 - Encourage the monitoring of groundwater well water level monitoring by public water suppliers and industrial facilities that are not already required to do so and consider incorporating data into statewide drought monitoring

5. Considering the anticipated effects of climate change, all community water systems (as well as self-supplied users) should evaluate the vulnerabilities of their respective sources to the impacts from expected increases in both the frequency and intensity of flooding and ~~the frequency and intensity of~~ droughts. These systems and users should follow their Uninterrupted System Service Plan to promote resiliency and redundancy and, where needed, seek: (i) diversification of sources (e.g., avoiding reliance on a single surface source or well field tapping the same resource); (ii) interconnection with neighboring systems; (iii) raw or finished water storage; (iv) development and implementation of conjunctive management plans for coordinated use of surface and groundwater sources; and (v) focused monitoring of source conditions, with contingency plans for implementing conservation measures and adjustment of water withdrawals in order to preserve the ability to meet essential needs through drought conditions.