

THE ENVIRONMENTAL IMPACT OF ROCKWOOL ON JEFFERSON COUNTY

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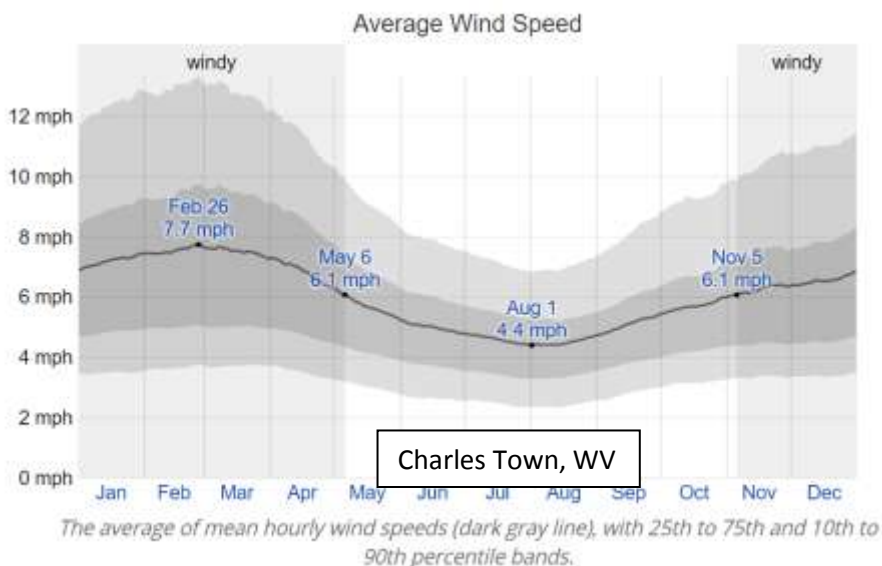
AIR QUALITY:

The 21-story smokestacks are permitted to emit 470 tons of volatile organic compounds (VOC) and 239 tons of nitrogen oxides each year. This will make the Rockwool factory in Jefferson County the second largest VOC polluter and the tenth Hazardous Fine Particulate Matter polluter (PM 2.5) in the state of West Virginia, based on 2014 EPA NEI data. The dramatic increase of toxic emissions and particulate matter air pollution pose a threat to all residents, particularly the most vulnerable-the children, the elderly, and those with compromised respiratory systems.

David Michael Glenn PhD; the retired director of the USDA-ARS-Appalachian Fruit Research Station, Kearneysville, WV, with over 30 years experience in weather measurement and interpretation, provided the following weather information related to the Rockwool project:

“As stated in the Rockwool permit, they will be emitting 471 tons/year of volatile organic compounds (VOC’s) and 239 tons/year of nitrogen dioxides (NOx’s), the building blocks of ozone, in addition to 154 tons/year of particulate matter. The reason that this project will construct 210 foot smoke stacks is to use wind currents to dilute and distribute the pollutants off-site.

It is my argument that wind characteristics in the Jefferson county area do not support this strategy and differ significantly from Milton, Ontario and the area near Byhalia, MS where Rockwool has existing and similar plants. The Rockwool plant’s plan for mitigation of particulate and gaseous emissions with a 210 foot tall smoke stack is unacceptable to Jefferson county given the wind behavior and prevalence of calm winds for extended periods of time throughout the year.



In Charles Town, WV, The windier part of the year lasts for 6 months, from November through April, with average wind speeds of approximately 7 miles per hour. The calmer time of year lasts for 6 months, from May through October with average wind speed of approximately 5 mph. (Source: <https://weatherspark.com/y/21067/Average-Weather-in-Charles-Town-West-Virginia-United-States-Year-Round>)

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The Effects of Calm Air Events on Particulate Pollution

From 2008 to 2017, 30% of the year had wind speeds less than 3 knots (3.45 mph) which the national Weather Service (NWS) classifies as 'calm' meaning there is no detectable wind motion by the instrumentation. The predominance of still air occurs at night but night or day, the still air provides ample time for particulates to settle to the ground in very close proximity to the site since this plant operates 24/7. Under these conditions, the nearby schools, businesses and homes will experience fallout of the particulate matter ranging from an average of 5 hours to an extreme of 15-20 hours throughout the year.

Ozone pollution is an additional concern. Ozone is a heavy gas and will settle to ground.

During the daylight hours from March to October when light and temperature conditions are adequate for ozone production (8 AM to 6 PM) due to the VOC and NO_x emissions, calm air occurs an average of 1.5 hours of each day but calm periods can occur for 6-8 hours. These are conditions typical of the spring frosts, inversions, and hot sultry days that occur in Jefferson county. Calm wind conditions would allow ozone to be generated at the top of the 210 foot tall smoke stack and settle nearby potentially affecting ozone sensitive groups, children and the elderly as well and further reducing soybean yield in nearby farms due to direct ozone damage.

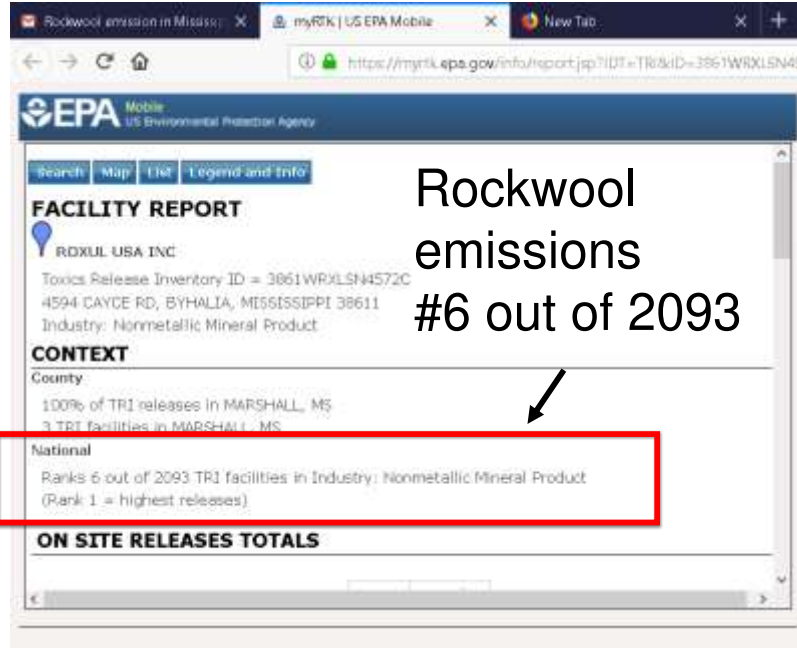
These data do not support the premise of Rockwool that a 210 foot smokestack will distribute and dilute its emissions with no effect on the populace and businesses of Jefferson County.

Deficiencies of the AERMOD model of air pollution used by EPA and WVDEP

If you wonder why the WVDEP did not consider these conditions, it is because the AERMOD model of EPA uses hourly data and pools data into average annual events to arrive at average annual emission levels. Details such as extended periods of calm air are masked by the pooling protocol required by the AERMOD model. The 'devil is in the details' and those details are a critical issue in the acceptance of the Rockwool plant into the community of Jefferson County. There is no 'average' person and no 'average' day, month or year. It is the unique characteristics of each day that will determine the effect of Rockwool's emissions on the businesses and population of Jefferson County. The fact that the WVDEP is unable to model to such a fine level of detail does not dismiss the fact that extended calm periods will have an effect in Jefferson County.

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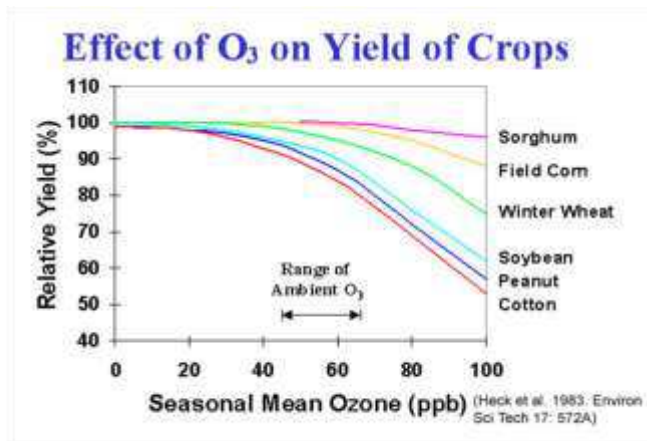


FARMING, AGRICULTURE AND ORCHARDS:

The increased pollution will impact the natural environment, including the land, agriculture and vegetation. Retired director of the USDA-ARS-Appalachian Fruit Research Station, Kearneysville, WV; David Michael Glenn PhD cites peer reviewed literature that increased ozone levels from Rockwool could reduce crop yields for soybeans by up to 50%, winter wheat by 25% and corn by 10%. Rockwool could harm livestock and cattle, particularly horses, which are 15 times more sensitive to particulate matter pollutants in the air than humans, according to a new study published in the journal of Veterinary Internal Medicine. Pollination by bees, which is critical to local orchards, will be impacted because of the environmental problems and loss of habitat resulting from the construction and operation of the factory



Ozone damage on soybeans (<https://www.ars.usda.gov/southeast-area/raleigh-nc/plant-science-research/docs/climate-changeair-quality-laboratory/ozone-effects-on-plants/>)



NOISE AND LIGHT POLLUTION:

The factory will operate twenty four hours a day, every day of the year. It will create increased noise and light pollution for the residents, schools and businesses located within sight and hearing distance from the factory. The large number of heavy duty trucks, some carrying loads of coal, stone, and potentially natural gas, entering and leaving the factory twenty four hours a day, will also dramatically increase noise pollution for local residents.

VISUAL POLLUTION:

The Rockwool factory is located in close proximity to eleven structures listed or eligible for the National Register of Historic Place, according to the Jefferson County Historic Landmark Commission. The sight of the two 213 foot high smoke stacks, their lights and the emissions coming from them will negatively impact the views to and from local historic battlefields of Antietam and Shepherdstown, Harpers Ferry National Park, the Appalachian Trail as well as views of the first ridge of the Blue Ridge Mountains.

The smoke stacks will be visible from every corner Jefferson County, including public lands and properties in conservation easement, many funded by the American Battlefield Protection Program



WATER SUPPLY AND RIVER POLLUTION:

The Rockwool factory is located in the Chesapeake Bay watershed and the Shenandoah River flows into the Potomac River which then flows into the Chesapeake Bay. Storm water runoff, outside factory spills and overflows from the above ground lagoons from the Rockwool factory will flow into Rocky Marsh Run which flows into the Potomac River. Communities, both locally and those down river from Rocky Marsh Run which depend on drinking water from the Potomac River could be impacted by the release of contaminants from the factory, potentially impacting the health of the river and the safety of the public water supply. Rocky Marsh Run is also in the Shepherdstown water supply watershed. The City of Shepherdstown pulls water from the Potomac River just after Rocky Marsh Run enters the river.

According to Rockwool's application for a West Virginia national pollutant discharge elimination system water pollution control permit modification, dated November 1, 2018, non-domestic wastewater from Rockwool at the Charles Town's main wastewater treatment plant for ultimate treatment and discharge through Outlet 001, will feed into Evitt's Run, a tributary Shenandoah River of the Potomac River.

The Corporation of Harpers Ferry at its August 31, 2018 meeting was particularly concerned about what it has identified as a PSSC – "Potential Source for Significant Contamination" to the Harpers Ferry water supply. Elks Run and its tributary the Elk Branch, are the main sources of drinking water for residents of Harpers Ferry, Bolivar, adjacent county customers, and the National Park Service. This watershed area is of critical concern and requires detailed scrutiny due to the proximity of the Rockwool plant to the Harpers Ferry surface water intake and the intake's susceptibility to potential contaminants.

UNDERGROUND WATER SUPPLY, WELLS, SPRINGS, SINK HOLES:

Water for 80% of Jefferson County residents, businesses and farms is obtained from private wells. The April 2, 2012 report, "**County-Wide Groundwater Assessment Jefferson County, West Virginia**" states that there are approximately 15,500+ wells in the county. The study also noted that there are areas of Jefferson County that are abundant with groundwater and also that demonstrate robust recharge. The report indicates that groundwater levels are affected by rainfall quantities, temperature and usage. According to Mary T. Sell of the Jefferson County Water Advisory Committee, the document is full of information about the availability of groundwater in the County to help inform decisions on how to best utilize and protect this critical natural resource in our County. The Assessment was prepared for the Jefferson County Commission.

Colin Stine, of Elmwood Farm has expressed concerns about the study's findings. He states that the models used to determine whether there is sufficient water is a generalized model which works 95% of the time. However he thinks that it does not emphasize the importance of karst, and Jefferson County is primarily karst. Therefore the models for water that were used are likely to be inaccurate. The most recent map of wells in the county was done in 2012 and includes less than 10% (~950) of the 15,000+ wells in the county. Ground water streams and wells need to be mapped before an accurate model can be produced. The assessment also does not report on the groundwater dye experiments done for USGS. The assessment does not do justice to our karst system. Sinkholes in Jefferson County have direct connections to the groundwater and the groundwater flows rapidly in karst (limestone).




The location of the Rockwool factory, the sinkholes in Jefferson County and the local hydrology raises the possibility of pollutants entering the groundwater and contaminating wells and springs. A spill or leaking sewer line could result in health and safety issues as the contaminated material moves underground rapidly and is difficult to track and to clean up. According to maps by D.H. and K. Doctor in "Carbonates and Evaporates", June 2012, Vol 27, Issue 2, **the highest concentration of sinkholes in Jefferson**

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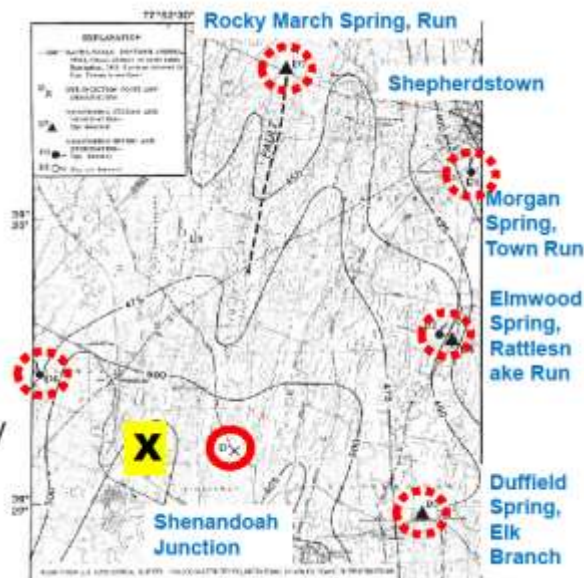
County is located adjacent to the proposed Rockwool site. The factory site is also located at the headwaters of a number of County streams.

In the 1990s, a county study injected dye into a well near Bardane in the Elk Run watershed and within less than two weeks the dye was also found in Rocky Marsh Spring, which feeds Rocky March Run, almost 8 miles away. The dye also found its way to the Morgan Spring, which feeds the Town Run, Elmwood Spring, which feeds Rattlesnake Run and the Duffield Spring- Elk Branch. The dye moved rapidly underground over a large landscape and took 25 weeks to clear from all locations. (Kozar, M. D., et al., 1990. Geohydrology, Water Availability, and Water Quality of Jefferson County, West Virginia, with Emphasis on the Carbonate Area. U.S. Geological Survey, Water-Resources Report 90-4118).

Any chemical introduced into the groundwater near the Rockwool Factory will contaminate the water of the northern part of the county

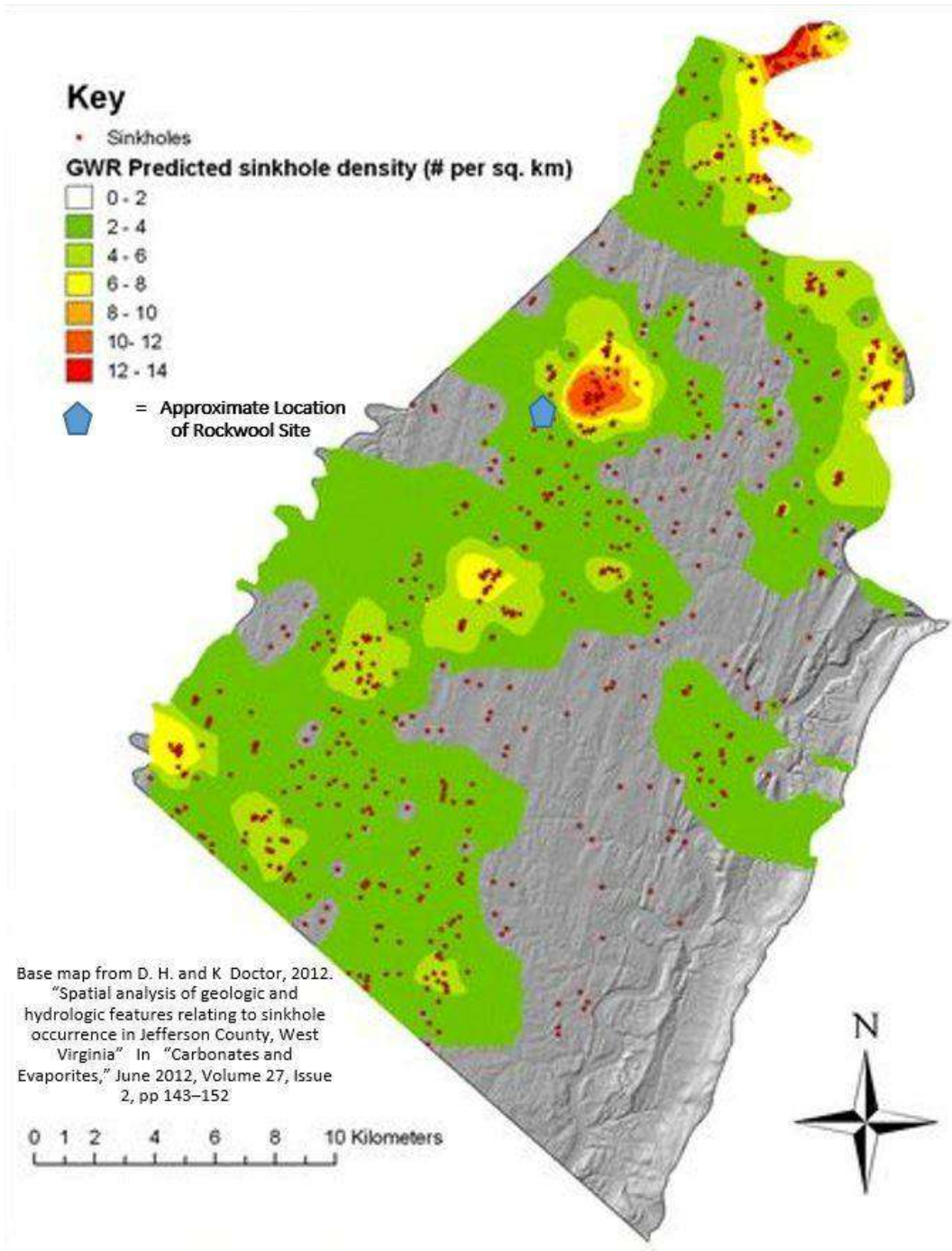
-  Injection point
-  Proposed Rockwool Factory
-  Dye detected weeks later

Detection 2 weeks later at Rocky Marsh and it takes 25 weeks to clear from all locations



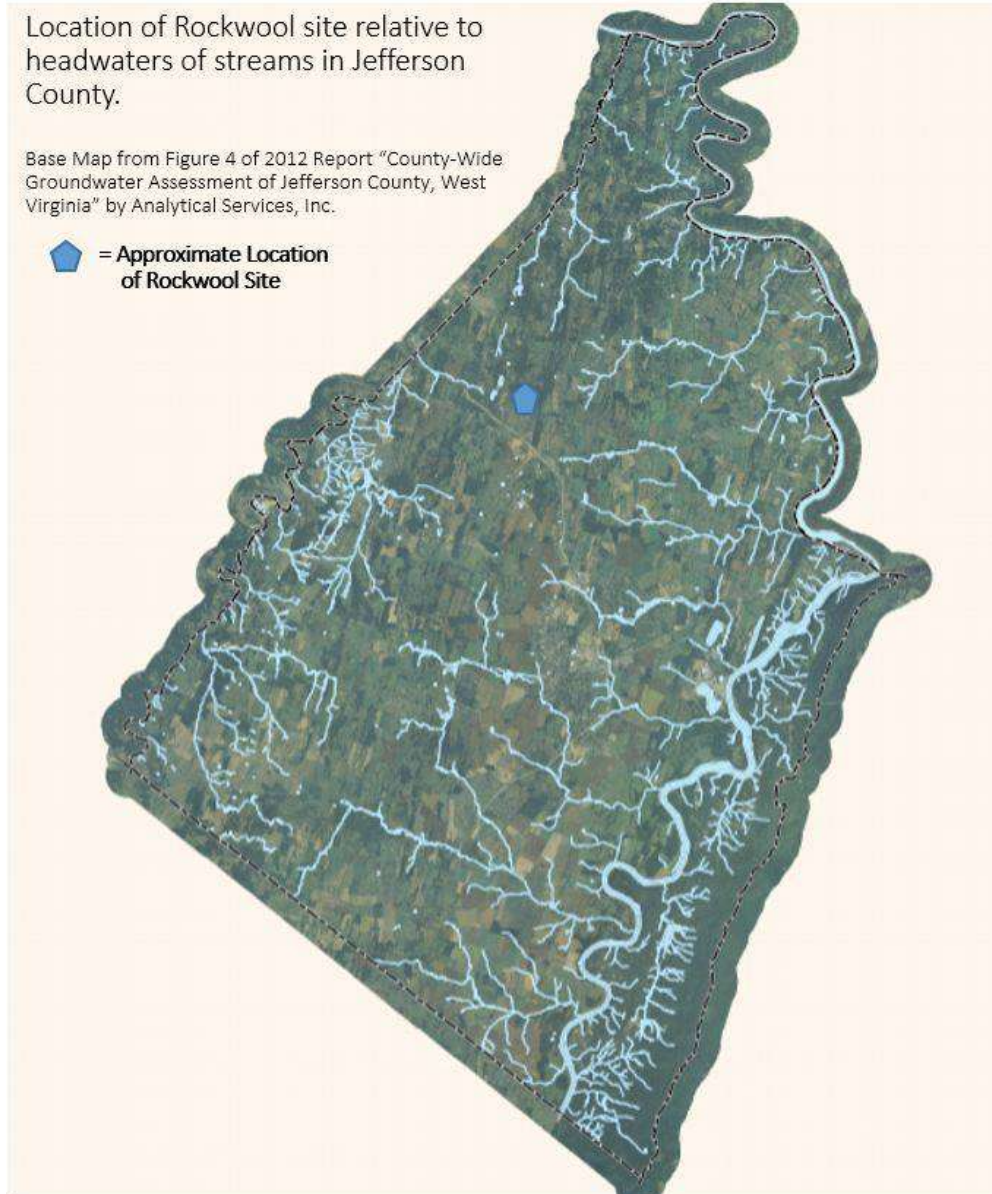
According to Colin Stine, whose family has lived and farmed in Jefferson County since the 1940s, the water flow on his farm from the underground aquifer has significantly decreased in the past 30 years. The farm has five permanent springs, three seasonal springs and Rattlesnake run which flows through the center of the property. During the last ten years three of the permanent springs have gone dry in the fall, if the season is dry enough. In 1999 a portion of the Run which passes through the farm went dry for the first time. Since then a portion the Run has gone dry during the fall in most years and in the past decade has gone dry every year, except in 2018. A portion of the Run goes dry because of an estevalle in the stream in the middle of the farm. An estevalle is a form of sinkhole with a dual function. It either discharges water as a spring or allows water to sink into the aquifer, depending on the groundwater conditions. The water problems of the Run on the farm have not yet affected the downstream water flow because there is one spring that has never gone dry and the Run is fed by other water sources. Another local farmer also reported that the Run through his property went dry because a sink hole opened up on the bank of the stream and all the water flowed into the sink hole. The water flow in the Run was restored once the bank was rebuilt. Also In 1999, "Elmwood Farm Spring" which is usually eight inches deep in the spring house, was down to about two inches deep. Thus the potential further lowering of the water table would cause that spring to go dry and affect the downstream water flow in the Run.

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STREAMS, WETLANDS, AND RARE MARL MARSHES:

Rockwool proposes to withdraw 125 thousand gallons of water per day initially and then up to 500 thousand gallons of water per day. The internal underground drainage systems in karst areas are very sensitive to extraction. Removing this quantity of water from the aquifers can have very serious and unpredictable adverse consequences. Lowering of water tables can affect the hydrologic equilibrium of local streams as well as wetlands, including rare marl marshes, at substantial distances from the point of extraction. The potential impact is loss of critical wetland and riparian habitat for threatened and endangered species of plants and other forms of wildlife.

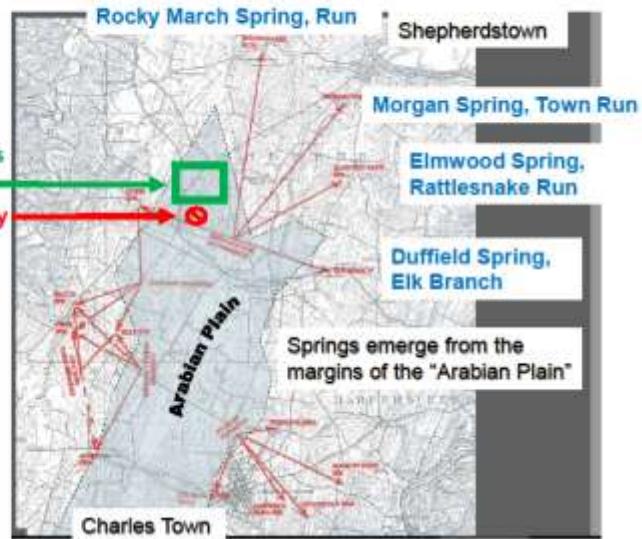


Water Pollution in the Arabian Plain impacts most of the county

Highest density of sinkholes in the county

Proposed Rockwool Factory

Small red arrows rapid flow away from Arabian Plain to springs that feed our streams



ENDANGERED, THREATENED, AND RARE SPECIES:

In Jefferson County twenty-seven rare species live in the marl marshes. There is also one federally-listed Threatened Species: the Madison Cave Isopod, a small crustacean that lives in groundwater and has been documented in three locations, including two sites near the Rockwool factory. The WVDNR identifies several "High Quality and State Mussel Streams" including Evitts Run, Bullskin Run, Elks Run, and Long Marsh Run. The USFWS and the WVDNR also maintain lists of species of concern which includes the Baltimore Checker spot butterfly and Sedge Wren.

MIGRATORY BIRDS:

Jefferson County is positioned on the Atlantic Flyway and immediately to the east of the Allegheny Front. Many migrating birds take advantage of the winds from the mountains and ridges of the Appalachian range to mitigate the challenges to their biennial long-distance flights. Migratory birds are protected under the Migratory Bird Treaty Act, which not only protects the birds themselves but also sets stipulations to protect habitats necessary for the birds' survival. According to Suzanne Offutt, Board President of the Potomac Valley Audubon Society air emissions from the Rockwool factory, especially particulate matter, will create hazards to migrating birds using the Atlantic Flyway.