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Risk Assessment of PCB Exposure from MVP in Southwest, VA

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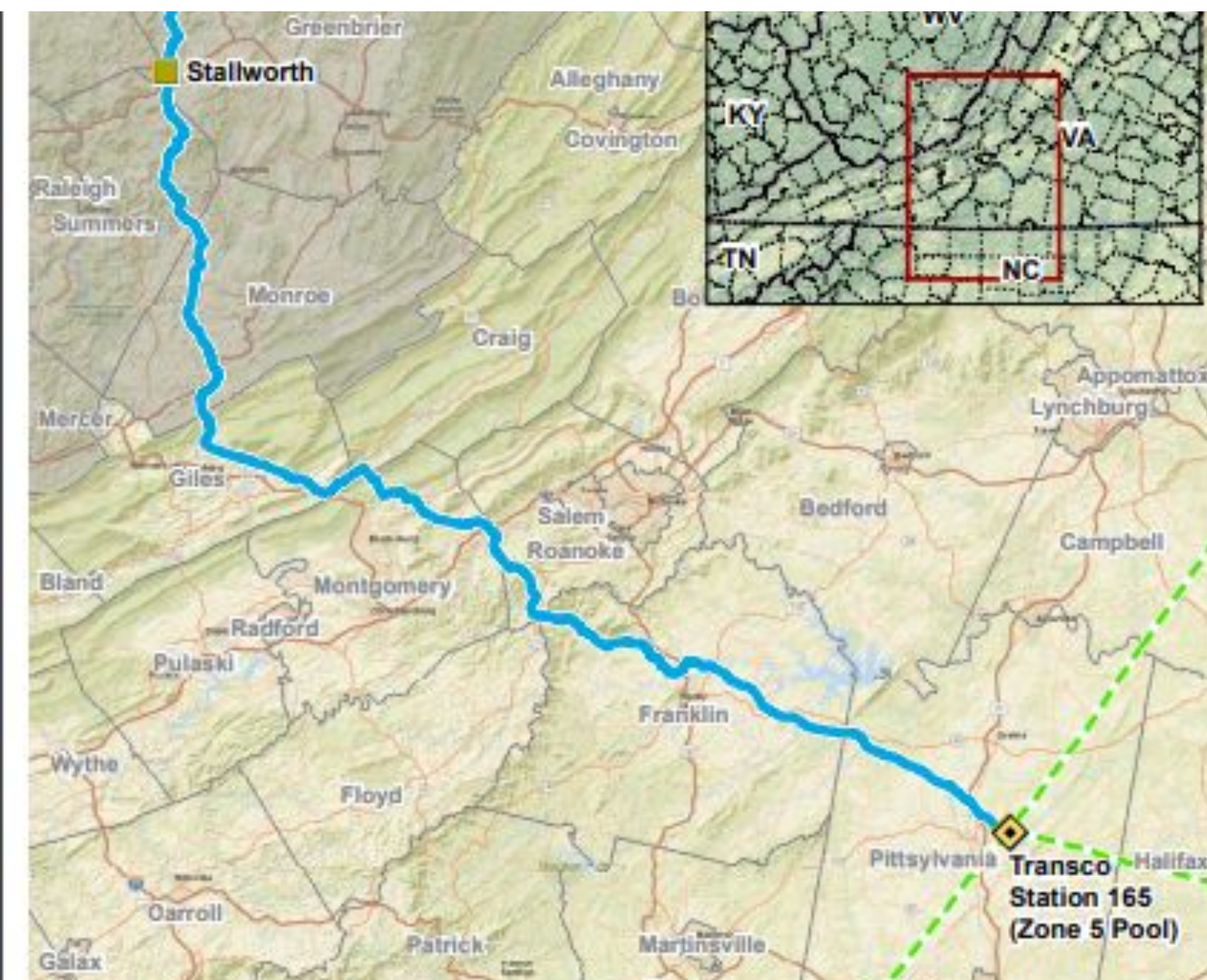


Background

Mountain Valley Pipeline

- 303 Mile Construction Project (1).
- Designed to transport natural gas from WV to Pittsylvania County, VA (1).
- In 2017, Mountain Valley Pipeline, LLC was accused of over 300 violations of building permits; the vast majority of these were in relation to failures to limit sediment pollution of stormwater runoff and local bodies of water (2).

Figure 1 (Below). MVP Route. This map shows the construction route for the Mountain Valley in Virginia (1).



Hazard Identification

Sediment pollution can lead to toxicological risks because it may contribute to elevated levels of Polychlorinated Biphenyls (PCBs), chemicals that have been shown to bioaccumulate in marine life and are linked to significant toxic effects in humans, in navigable waterways (3 & 4).

PCBs have been linked to a variety of toxic effects, the two investigated for the purpose of this risk assessment were:

Aroclor 1016 and Aroclor 1254

AIM: To develop a perspective on the toxicological risks of the MVP construction project in Southwest Virginia

STEP 1: Identify Hazard and Examine Dose-Response Relationship

STEP 2: Collect Information on the Demographics of Surrounding Community

STEP 3: Assess Risk to Surrounding Community and Determine Strategy for Risk Management

Risks of Exposure

Increased Incidence of Cancer:

Mayes et al. (1998) found that exposure to dietary concentrations of 0, 50, 100, or 200 ppm of Aroclor 1016, 1242, 1254, and 1260, Sprague-Dawley Rats led to dose-related increases in the incidence of liver lesions in female rats, as well as increases in hepatic cancer for females and thyroid cancer for males (5).

Neurological Effects:

Early exposure to PCBs has been linked to cognitive deficits in children; Parent et al. (2016) found that mice exposed orally to Aroclor 1254 from embryonic day 6 to postnatal day 21 experienced interruptions in synaptic development of hippocampal neurons, suggesting that PCBs may have an impact on neurological functioning (6).

Decreased Pancreatic Function:

Lin et al. (2016) found that mice exposed to Aroclor 1254 demonstrated dose-dependent atrophy of the pancreas (7).

Demographic Data

Locality	Population	Adults > 25 yo w. 4 year degree	Median Household Income	Poverty Rate
Virginia	8,535,519	38.8%	\$74,222	9.9%
Pittsylvania County	60,354	14.5%	\$47,690	15.1%
Franklin County	56,042	21.9%	\$56,254	11.5%
Craig County	5,131	23.6%	\$55,608	11.2%
Giles County	16,720	18.1%	\$54,520	11.4%
Montgomery County	98,535	45.5%	\$57,977	20.5%
Roanoke County	94,186	36.5%	\$68,948	6.5%

Table 1. Demographic Information of Localities Impacted by MVP Construction. Adapted from U.S. Census Bureau (8 & 9).

Sediment Pollution



Figure 2(Above). Stormwater Runoff. This image is a picture of poorly-controlled stormwater runoff at an MVP construction site (10).

Conclusions

- The primary risk associated with MVP construction is contamination of waterways via sediment pollution, so, if disruptions to the existing landscape, and the resulting sediment pollution, are corrected, the project poses little toxicological risk to the surrounding community.
- Therefore, periodic water quality assessments should be performed to examine local waterways for the foreseeable future.
- If there is evidence of elevated concentrations of PCBs in these areas, Virginia's Department of Environmental Quality should conduct an investigation of MVP's practices and, if applicable, bring a lawsuit against MVP and its subsidiaries in the Commonwealth of Virginia to cover costs for associated environmental clean-up efforts and continued water quality assessment.

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References
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