

Indian Creek Watershed Association
P.O. Box 711
Union, WV 24983
www.IndianCreekWatershedAssociation.org

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**RE: Evidence of Prevalence and Density of Springs On/Near the MVP Corridor in Sample Areas of Monroe County, WV, Confirms Need for Hydrogeological Studies.
Docket No. CP16-10-000 (PUBLIC)**

TO: Ms. Kimberly Bose, Secretary, Federal Energy Regulatory Commission (via e-filing)

U.S. Environmental Protection Agency, Region 3

Mr. Jon M. Capacasa, Director, Water Protection Division
Barbara Rudnick, NEPA Team Leader

U.S. Army Corps of Engineers, Huntington District

Mike Hatten, Regulatory Permits – Energy Resources
Christopher L. Carson

West Virginia Department of Environmental Protection

Randy Huffman, WVDEP
Scott Mandirola, Division of Water and Waste Management
Wilma Reip [401 Certification Program]
Nancy Dickson [Stormwater Permit]
Wendy Radcliff

CC: West Virginia Dept. of Health and Human Resources—Compliance and Enforcement Program
Meredith Vance

West Virginia Department of Natural Resources

Robert Fala, Office of Land and Streams
Danny Bennett

WV Bureau for Public Health

William Toomey, Unit Manager, Source Water Assessment and Wellhead Protection Program
Environmental Engineering Division

EVIDENCE OF PREVALENCE AND DENSITY OF SPRINGS ON/NEAR THE MVP CORRIDOR IN SAMPLE AREAS OF MONROE COUNTY, WV, CONFIRMS NEED FOR HYDROGEOLOGICAL STUDIES (PUBLIC)

ICWA is today submitting maps that locate over 98 springs on or near two sections of the pipeline in Monroe County. Data about these springs have been gathered to provide the FERC and other agencies information that, in most cases, is not in the current docket. In doing so, we provide an example of the level of diligence that is required to protect the water of the state and the drinking water of the residents in Monroe County. We conclude that without hydrogeological studies that examine the potential impact of pipeline construction in a region of complex karst and compound geologic hazards—and the potential impact of blasting on springs and wells in near and neighboring properties—the FERC lacks sufficient information to make a considered judgment about whether or not to permit the proposed route in Monroe County. The FERC should therefore require such studies before issuing a draft EIS that includes a route through Monroe County.

BACKGROUND:

The FERC is required by NEPA and the Clean Water Act to consider the effects of the pipeline on drinking water aquifers. In order to comply with that provision, first it must have identified the springs which will be affected. Sources of previously submitted information about the springs in Monroe County include:

- MVP—MVP’s information about the springs on and near any of the routes through Monroe County has been insufficient and is based on its desire to build a pipeline rather than the facts. In its original filing, when MVP justified its choice to route the pipeline through Monroe County, it asserted that there was only one spring. While this information has been found to be false and misleading, MVP has not changed its mind, instead choosing to ignore the effects of the pipeline on water resources both on the route and on the near and neighboring properties.
- Publicly available information—There is a sharp contrast between publicly available data and on-the-ground data. The ICWA Interactive Environmental Map illustrates this point. Brian Geoff Richards¹ as part of his Masters thesis in geology at WVU performed a ground study wherein he collected data about and provided coordinates for 221 springs on the northeastern section of Peters Mountain in Monroe County. Once ICWA had access to mapping capability, we were able to plot the Richards data and it is shown in Figure 1b. In contrast, Figure 1a shows the same section of Peters Mountain with the information available on the DEP and other agency data bases but **without** the “Richards” layer. This public data map shows only 8 springs, or 4% of the number of springs discovered by Richards in his on-the-ground study. There can be no stronger example that affirms the need of an extensive on-the-ground study of the springs of Peters Mountain. Public information is insufficient. Reliance on public information instead of ground studies can be misleading to those charged with locating or permitting projects.
- Landowner Reports—Two hundred and fourteen (214) landowners on or near the originally proposed MVP route and the Alternate 110 route submitted information through, respectively, Save Monroe and The Border Conservancy, about features on their property including water features and use. This information relied on participation from landowners and did not include all properties along the route. Individual landowner reports were submitted both electronically and in hard copy to the FERC to the confidential section of the docket, and have been therefore available to the FERC staff.

¹ “Aqueous geochemistry of springs along Peters Mountain in Monroe County, WV,” Brian Geoff Richards, submitted to Docket PF15-3-000, 5/21/15. Accession No. 20150521-4015.

- Indian Creek Watershed Association—ICWA submitted information that showed a count of springs on various landowner properties on the MVP route. This submittal did not include all of the springs on the route.

IN THIS CURRENT SUBMISSION we are supplementing our previously submitted information with additional empirical evidence that is necessary for FERC to consider in deciding whether to site the pipeline through Monroe County.

Method: ICWA volunteers have located and are hereby documenting the presence of over 98 springs in two of the many vulnerable areas in Monroe County that would be degraded or potentially destroyed by MVP—the Peters Mountain crossing and the Ellison Ridge area. These areas are shown in Figures 2a and 3a. Although geological information about these general areas was submitted in previous ICWA reports, information about most of these springs was not included because ICWA had not yet collected and mapped it.

ICWA volunteers located the springs by walking the properties with GPS devices and supplied the GPS coordinates to place them on the ICWA Environmental Map.² The layers containing these springs are not available to the general public out of consideration for landowners’ privacy of information; however, ICWA is herewith submitting them to the FERC docket under separate privileged status. They are similarly marked as Figure 2b (confidential) and Figure 3b (confidential) respectively.

I - PETERS MOUNTAIN (Figures 2a and 2b)

To comply with provisions of NEPA and the Clean Water Act, the FERC must have accurate and complete information about the water resources on Peters Mountain and the cumulative effect of geological features on those resources.

Empirical data: Figure 2a (public with the area outlined in red) and Figure 2b (confidential and not revealed in the public section of the docket) show the location of 38 springs on Peters Mountain in close proximity to the proposed MVP route. The ICWA Interactive Environmental Map has allowed us to pinpoint the location of each of these springs and to begin to consider potential risks and hazards to these springs given different interacting factors such as slope, soil type, depth to bedrock, relationship to karst, location within seismic zone, etc.

- In this submittal, ICWA provides evidence that springs are prevalent and densely located in the region of Peters Mountain that is crossed by the pipeline. The number and density of the springs in the region observed by the ICWA volunteers is roughly equivalent to that in an area of comparable size selected from the Richards map. Presumably, the prevalence of springs would be the same all along the 34-mile stretch of Peters Mountain in Monroe County.
- In comparing Figure 2a with 2b (as we did with the Richards data), we again see that publicly available data from state and federal agencies is virtually non-existent in this *southwestern* section of Peters Mountain. While ICWA volunteers located 38 springs through their on-the-ground work, the public information only shows 1 spring in the same region (3%).
- The springs in Figure 2b (confidential) are clustered more densely to the south of the proposed route because the ICWA volunteers focused on that area before MVP jiggled the original route. That does not change the conclusion that wherever MVP moves the line along Peters Mountain,

² The ICWA Interactive Environmental Map is available to the public and can be accessed through www.IndianCreekWatershedAssociation.org —Technical development and hosting of the map is by Downstream Strategies, LLC, of Alderson, West Virginia.

on-the-ground citizen scientists will find high quality springs in a density comparable to the ICWA and Richards observations. Wherever the MVP shifts the route, however, it is the responsibility of MVP and the FERC, not unpaid volunteers, to identify and consider all potential hazards to drinking water

- ICWA emphasizes that the data being submitted today do not provide a complete inventory of the springs on this region of Peters Mountain. They are simply evidence that there is insufficient information about springs in the MVP application and that the location and geological qualities of the springs on Peters Mountain must be determined and considered before a pipeline can be approved by the FERC.

Significance: NEPA and the Clean Water Act require that the FERC consider the cumulative effects of the pipeline.

- The highly uncertain and potentially significant environmental effects of the pipeline are explained in the Kastning report³—The MVP pipeline built through karst geology which includes springs, caves, sinkholes, and other fracture features would pose unique environmental risks to the underlying aquifer. Given that there is no hydrogeological study of this area at the present time, NEPA regulations would require a hydrogeological study to discover the interconnectedness and the direction of the underlying aquifers on Peters Mountain to establish the facts upon which the FERC could make a decision.
- **In its submittals to the FERC, MVP submits NO INFORMATION about springs that are on land parcels that do not include the pipeline Right of Way or workspaces.** However, impacts to groundwater sources do not confine themselves to Rights of Way or parcel boundaries. Pipeline construction or blasting may change the fracture lines of rocks in the surrounding area through which ground water moves and springs are defined, and a permanent 42-inch diameter pipeline and associated trench will have a permanent impact on water within and beyond the ROW.
- The Kastning report cites the example of contamination of the Red Sulphur Public Service District spring to show that pollution travels through the karst. This incident points to the need for a complete study of the aquifer on Peters Mountain before a pipeline route can be sited.
- Because of the density of the spring locations and possible interconnectedness of the aquifers, mitigation (e.g., buffer zones) to protect springs that are not directly on the line cannot be instituted without hydrogeological studies before a pipeline can be sited. Afterwards is too late.

II - ELLISON RIDGE (Figures 3a and 3b)

To comply with provisions of NEPA and the Clean Water Act, the FERC must have accurate and complete information about the spring water resources on Ellison Ridge, the cumulative effect of geology on those resources, and the effect of the pipeline on the drinking water of low income residents.

Empirical data: Figure 3a (public) and Figure 3b (confidential and not revealed in the public section of the docket) show the location of more than 60 springs on Ellison Ridge and in the Greenville area in close proximity to the proposed MVP route.

³ “Geologic Hazards in the Karst Regions of Virginia and West Virginia,” Ernst H. Kastning, PhD, PG, submitted to Docket CP16-10-000, Accession # 20160713-5029.

- Figure 3a shows that if one were to rely only on public information sources there would be no concern about the springs along the line between mileposts 181 and 188 because there are only 2 springs in that same region that has been identified by the federal and state agencies (3%).
- These springs are usually not included in MVP’s submittals to the FERC because MVP generally omits springs that are on land parcels that do not include the pipeline right of way or workspace.
- The ICWA Interactive Environmental Map shows the location of these springs on steep slopes below the ridgeline where there is shallow depth to bedrock.
- The data in this report do not provide a complete inventory of the springs in this region of Monroe County. They are simply evidence that the MVP application contains insufficient data and that the location and geological qualities of the springs on Ellison Ridge and near Greenville must be determined **before** a pipeline can be considered by the FERC.

Significance: Critical Water Resources—NEPA regulations require that the FERC must consider the possible devastating impacts on residents if the MVP pipeline destroyed or degraded the principal and sole drinking water aquifers which supply the spring and well water on Ellison Ridge.

- In order to protect drinking water aquifers, the FERC must consider the effect of the pipeline construction on property near the pipeline route as well as on the pipeline route itself.
- In an August 2016 hydrogeological assessment of impacts to the watersheds of Summers County and Monroe County caused by construction of the proposed MVP route, Dr. Pamela C. Dodds, professional geologist, finds that “The MVP gas pipeline construction will require deforestation and blasting, both of which will reduce groundwater recharge and cause significant changes to the amount of groundwater available as a drinking water source, as well as to groundwater flow routes” (p. 4).⁴
- The pipeline’s effect on the springs must be studied in combination with the effects of the other geologic and hydrological features such as slope, soils, and geology. Figure 4 shows the area of the Ellison Ridge-Greenville springs with two of these critical layers activated:
 - Soil erosion potential—The potential for soil erosion is “high” and the steep slopes could advance runoff and degrade the springs and creeks below.
 - Depth to bedrock layer—According to MVP’s application, the shallow depth to bedrock would necessitate blasting. Blasting could destroy or degrade the springs and the water supply of the people who live on or near the line.
- There is NO PUBLIC WATER supply that serves Ellison Ridge. In a recent survey of Monroe landowners on and near the MVP Corridors, 80% reported that they depend on a private well or a spring as their primary source of drinking water; only 20% reported having access to public water.

⁴ “Hydrogeological Assessment of Watershed Impacts Caused by Constructing the Mountain Valley Gas Pipeline Through Summers and Monroe Counties, West Virginia,” Pamela C. Dodds, Ph.D., L.P.G., August 2016.

- *Testing* of water supplies does not mitigate destruction or degradation of spring water. It is not preventative. Testing only shows whether or not the water **has been** polluted. Spring water is simply irreplaceable. Once a spring is destroyed, it is gone forever.

Significance: Low Income Populations—The FERC must address the fact that the pipeline with its current route on Ellison Ridge will have a disproportionately high and adverse effect on the water supplies of low income populations.

- Monroe County residents rely on springs and wells for safe, reliable drinking water for their families, schools, businesses and livestock, as well as for irrigating vegetable gardens and crops. Ground and surface water does not respect property boundaries. At this point, MVP is only seeking easements from landowners on the pipeline or its worksites. Until there is a full analysis of the interconnectedness of underlying aquifers and the effect of the pipeline on headwater streams and springs, there can be no assurances that downgradient (in either above or underground flow direction) springs will not be affected.
- NEPA refers to this requirement as *Environmental Justice*. The common term is *Economic Fairness*. As seen in Figure 5, the 2014 median household income of the census tract (540639502.004) that contains the Ellison Ridge area stands at \$25,716 which is only 49.3% of the US median household income of \$52,076. Monroe County landowners who are not being paid for an easement on their property simply have neither the monetary resources to replace a water system nor the legal know-how and money to hire attorneys to engage in the complicated process to force enforcement of environmental laws and to obtain restitution for losses of their drinking or agricultural water.

CONCLUSION

Clearly the FERC cannot consider data that it does not have. **In order to protect spring water, the FERC must have current and accurate information about not only the springs that are on the pipeline corridor itself, but also the other springs that could be affected.** MVP restricts its disclosure of springs to those found on land parcels that are actually crossed by the pipeline—specifically property where MVP intends to buy an easement in order to build the pipeline itself. MVP **does not** submit information to the FERC that concerns springs that would be affected by the pipeline if those springs are on parcels that are **not** crossed by the pipeline.

All of the “waters of the United States,” including the “waters of West Virginia,” are protected by statutes and regulations enforced by federal (USEPA and USACE) and state (WVDEP) agencies. It is the obligation of these agencies to ensure that *all* waters potentially affected by this project and covered by the Clean Water Act are protected from pollution—regardless of construction easement boundaries, and whether or not landowners have granted easements to MVP.

As we submit empirical data about 93+ springs we wish to emphasize that this information is necessary but not sufficient for the FERC to perform its responsibility under NEPA and the Clean Water Act. Only a small section of the pipeline in Monroe County was included in our exploration. The purpose of our submitting these data is to show the importance of fieldwork that is informed by local knowledge and public input and the need for rigorous independent analysis by federal and state agencies to assure compliance with NEPA, the Clean Water Act, and other federal, state, and local laws. Buffer distances cannot be established in complex terrain without detailed professional hydrogeological analysis.

We therefore reiterate our request that the federal and state agencies with cooperating agency status on the MVP project require:

- **In-depth, independent hydrogeological studies of critical watershed areas**, especially in regions of karst or other complex geological features that can affect public and private drinking water sources. The range of travel of pollutants in the areas of the pipeline traversing karst topography is not known because of the intrinsic nature of karst. Therefore, ICWA requests that the FERC, USEPA, WVDEP and USACE require dye tracing, water parameter comparisons, and other methods of determining aquifer connectedness before issuing any draft permits. Such a study needs to be conducted over multiple seasons and a range of high and low water conditions in order to more accurately assess the changing underground patterns that can take place under different conditions. The afore cited example of the diesel pollutant discharged into the Red Sulphur Public Service District drinking water supply is a case in point that must not be repeated, but should be viewed as an object lesson that such avoidable contamination is both possible and unacceptable.
- **A comprehensive amended version of the “final” MVP application before issuance of the DEIS**—so that affected landowners, as well as cooperating agencies and other interested parties, have a realistic opportunity to view, evaluate, and comment on the actual proposed route, above-ground facilities, access roads, ATWS, hydrostatic testing locations, and other project-related features that are being considered by the FERC.
- **USACE and WVDEP consideration of 404, 401 Certification and the Stormwater Permit should not begin until after the FERC has issued a Certificate of Need**, thereby establishing a final route.
- **Individual permits which include site-specific plans to prevent impacts on individual stream and wetland crossings and prevent stormwater pollution and groundwater degradation.** The universal conditions in *General* permits are not sufficient to meet site-specific requirements for environmental protection by the 404, 401, and Stormwater permits given the scale of this project, the diverse types of crossings involved, and the unacceptably poor quality of work demonstrated by MVP in its filings to date. Publicly available data are inadequate for a full understanding of issues at individual stream and wetland crossings and other vulnerable locations in proximity to the pipeline route.
- **Establishment of Peters Mountain as a “No Build” Zone as proposed by Dr. Kastning.** MVP (and other similar projects) should be restricted from proposing a route that crosses Peters Mountain anywhere along its length: the geology is too hazardous and the potential for environmental damage is too great. There is no “best route” across Peters Mountain.

We support the comments made by the Red Sulphur Public Service District, the Monroe County Commissioners and the Monroe County Board of Health that raise concerns about the safety of Monroe County’s drinking water. A comprehensive hydrogeological study needs to be conducted before granting any permit for pipeline construction. Given the reliance on private springs and wells in this area, such a study should not be limited to areas close to public water critical zones, but should include all of the proposed pipeline route through Monroe County, if not the entire corridor.

Once again we invite a FERC team to visit us and see firsthand why the geology and water characteristics of Monroe County make massive pipeline construction too risky a threat at a time when water is being recognized as our most valuable national resource.

Respectfully submitted,

Indian Creek Watershed Association Board of Directors

Judy Azulay, President; Scott Womack, Vice President;

Howdy Henritz, Treasurer; Nancy Bouldin, Secretary

Email: info@IndianCreekWatershedAssociation.org

FIGURE 1a: Peters Mountain Northeastern Section
Showing only springs that are in the state and federal agency databases



FIGURE 1b: Peters Mountain Southwestern Section
Adding springs from Brian Geoff Richards Thesis

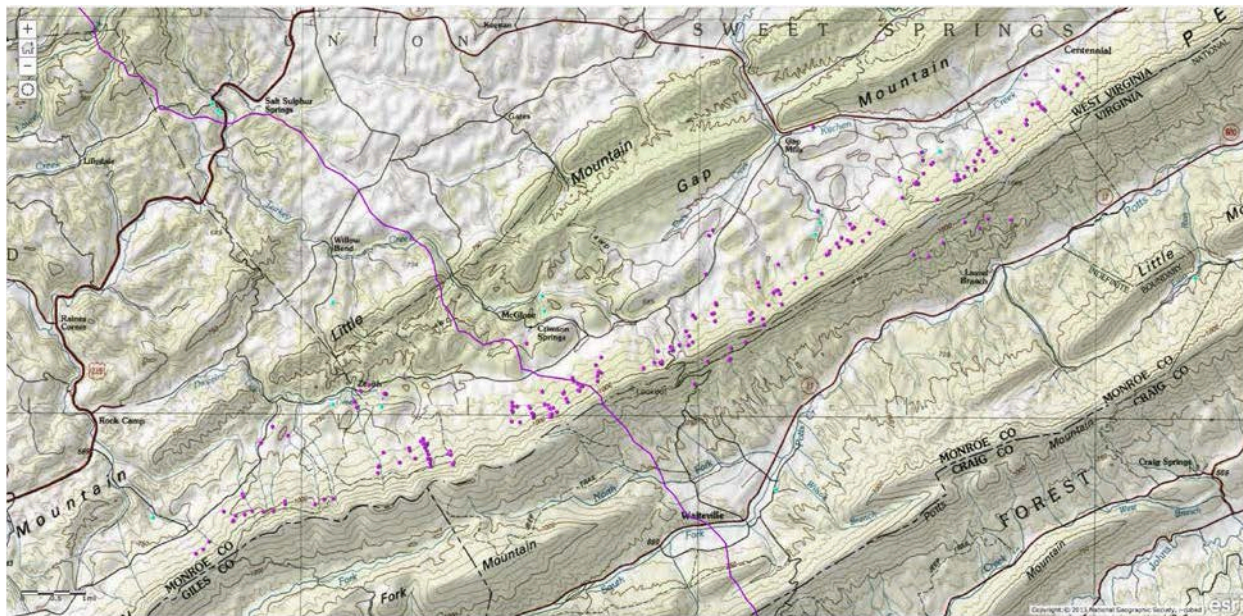
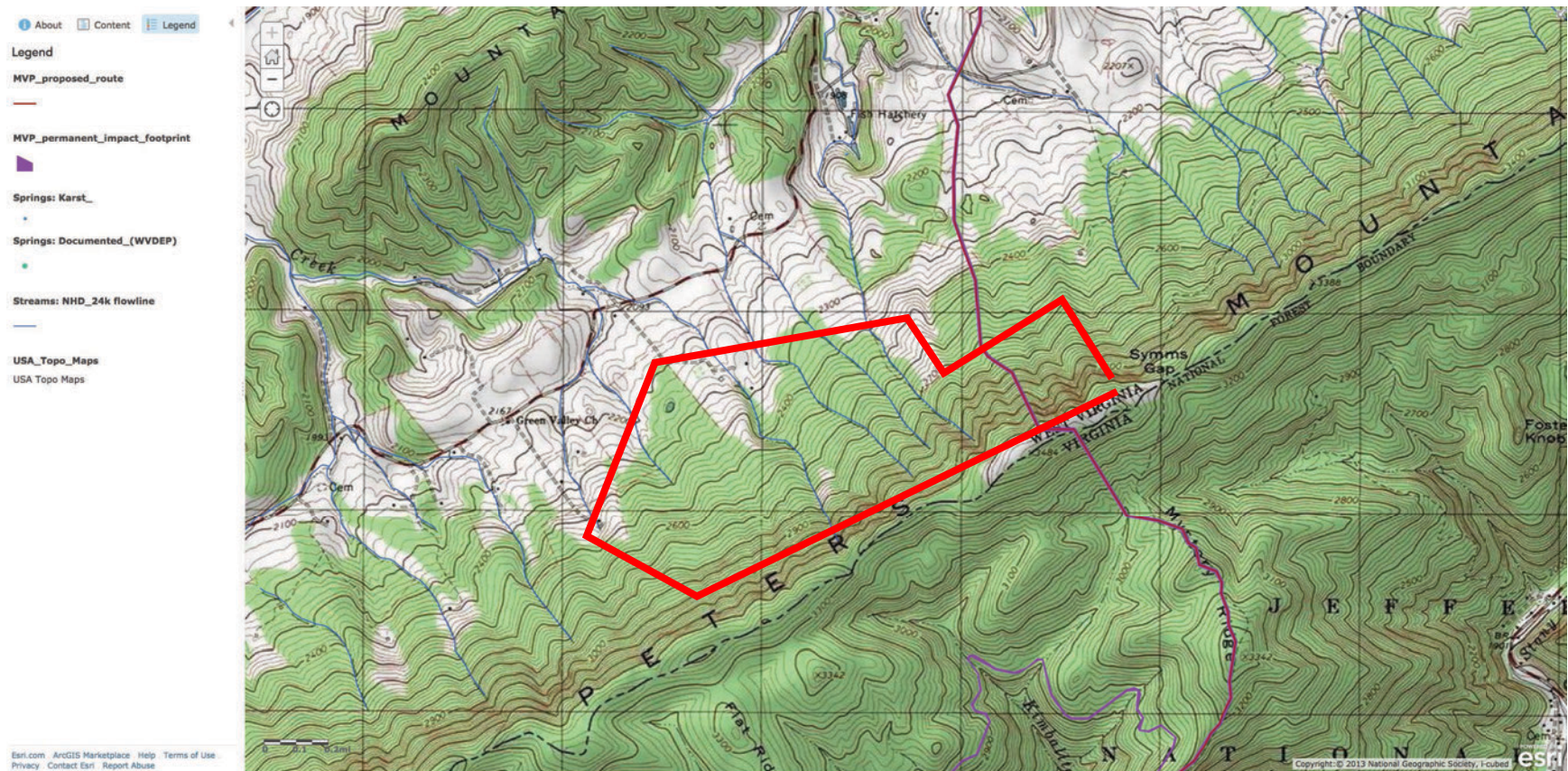


FIGURE 2a: Peters Mountain Southwestern Section

Showing springs that are in the state and federal agency databases and also outlining the general area of the 38 springs that have been identified by ICWA volunteers and submitted in privileged file



- Area of springs where ICWA volunteers identified 38 springs (submitted on privileged docket, Figure 2b)
- Springs in public karst database (1 spring)
- Springs in WVDEP database (0 springs)

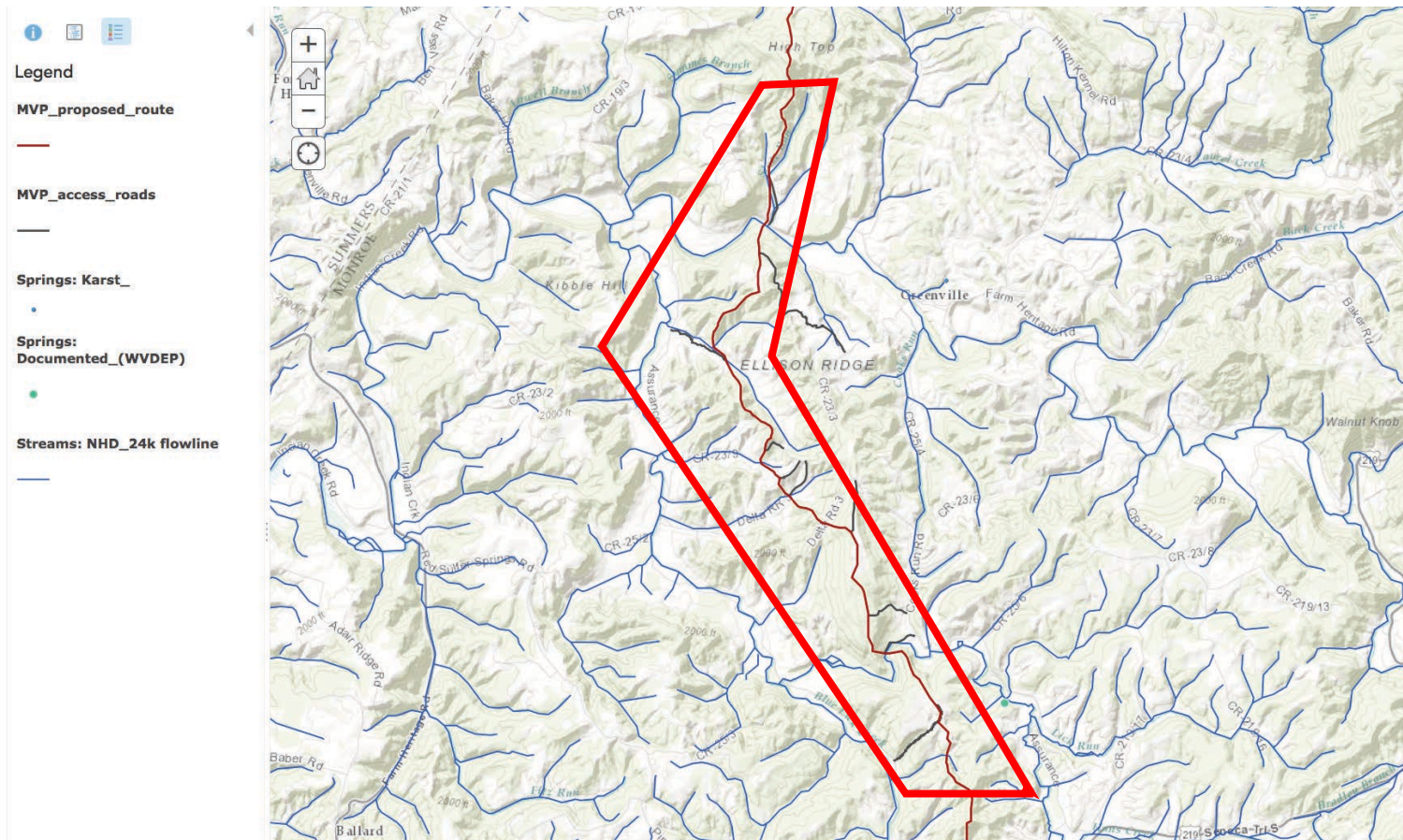
**FIGURE 2b: Peters Mountain Southwestern Section
Showing springs that have been identified by ICWA volunteers**

**THE LOCATION OF THESE 38 SPRINGS THAT HAVE
BEEN IDENTIFIED BY ICWA VOLUNTEERS HAS BEEN
FILED ON THE FERC DOCKET AS **PRIVILEGED**.**

**(SEE PAGES 3-4 FOR MORE INFORMATION ABOUT THESE SPRINGS
IN AREA OF SOUTHWESTERN SECTION OF PETERS MOUNTAIN.)**

FIGURE 3a. Ellison Ridge and Greenville Area of MVP Pipeline Route

Showing springs that are in the state and federal agency databases and also outlining the general area of the 60+ springs that have been identified by ICWA volunteers and submitted in privileged file



- Area of springs where ICWA volunteers identified 60+ springs (submitted on privileged docket, Figure 3b)
- Springs in public karst database (1 spring)
- Springs in WVDEP database (1 spring)

**FIGURE 3b. Ellison Ridge and Greenville Area of MVP Pipeline Route
Showing springs that have been identified by ICWA volunteers**

**THE LOCATION OF THESE 60+ SPRINGS THAT HAVE
BEEN IDENTIFIED BY ICWA VOLUNTEERS HAS BEEN
FILED ON THE FERC DOCKET AS **PRIVILEGED**.**

(SEE PAGES 4-6 FOR MORE INFORMATION ABOUT THESE
SPRINGS ON ELLISON RIDGE AND GREENVILLE AREA.)

FIGURE 4. Depth to Bedrock and Soil Erosion Potential in Ellison Ridge Area



ICWA Interactive Environmental Map accessed at www.IndianCreekWatershedAssociation.org

FIGURE 5. Census Tract Ellison Ridge Area, Monroe County, WV

