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February 20, 2023

Sent By Email Only to sm.fs.gw.jnf-pa@usda.gov

Dr. Homer Wilkes
Under Secretary, U.S. Department of Agriculture
George Washington and Jefferson National Forests

Re: ***Comments to NFS Concerning MVP Request to Cross JNF***

Dear Dr. Wilkes:

Based upon the following information which highlights insufficiencies in the Draft Environmental Impact Statement, we respectfully ask the U.S. Forest Service to protect the Jefferson National Forest (JNF), to select "Alternative (1) for **"No Action,"** to **reject the 11 Proposed Amendments and exceptions**, as they are inconsistent with the Forest Plan. For the reasons set forth below, we respectfully ask you to prohibit MVP from crossing our public lands.[1] We would greatly appreciate your confirmation of receipt of our materials.[2] Please consider the following:

NFS Mission and Practice

The NFS motto is "Caring for the Land and Serving People".[3] This motto is carried out through protection, management, research, community/landowner collaboration and assistance, maintaining effective workforce and international assistance in supporting thriving forests and watersheds.[4] The information provided here shows that the public has been *misinformed - for nearly two decades* - of the actual risk of explosions in gas pipelines. The Pipeline Safety Trust tallied over 6300 "reportable" gas transmission line failures in the last decade, fracked gas

[1] We adopt and incorporate the letter of Maury W. Johnson of Greenville, West Virginia, filed February 21, 2023, and the Joint Comments on the U.S. Forest Service Mountain Valley Pipeline (MVP) and Equitrans Expansion Project Draft Supplemental Environmental Impact Statement (DSEIS) of the Wilderness Society, *et.al.*, filed February 21, 2023.
[2] See Preserve Bent Mountain Motion/Notice of Intervention and Comments in Opposition to MVP Request for Certificate Extension of Four Years under CP 16-10, Acc. No. 20220729-5314, eLibrary | File List (ferc.gov) (additional background photos and concerns are raised here).
[3] fs.usda.gov
[4] *Id.*

distribution lines failures increased in the decade from 2010 through 2019.[5] Another public interest group reports that in the last decade, more than 2600 pipeline leaks killed 122 people across the country, causing more than $4 million in damage, releasing 26.6 billion cubic feet of planet warming pollution.[6] The NFS is tasked with protecting forests, water and communities with the power of permit denial to prevent harms including explosion, death and destruction associated with pipeline rupture. In the context of what has become a deadly energy infrastructure environment, the Forest Service must exercise its mission as applied to the danger presented and must ensure that the MVP does not kill.

Introduction: MVP has been found to have repeatedly violated regulatory laws. With permits revoked, the LLC has yet to cross 460 water bodies and 183 wetlands, many of which lie at the bottom of radically steep slopes - that equals about 85% of all MVP crossings.[7] Water crossings are complicated and time consuming, as evidenced by the nearly three months MVP took to cross one stream in the Wades Gap community of Franklin county, from July through October 2019 – that, following MVP's prior devastating stream - sullying construction season of 2018. These fragile mountain ecosystems will be crossed either by "direct trench cut" or by boring beneath soil and/or rock surfaces, the substance of which MVP failed to assess before construction began.[8]

MVP attempts to mislead investors and the public that the project is about 95 percent complete - the company's own FERC filings on final restoration show only a mere 55 percent in fact "complete". Weekly summary reports to FERC reveal that the company now spends an inordinate amount of time repairing "slips" and larger landslides, foreshadowing the high potential for the need for landslide restoration work in perpetuity.[9] Even with the structure and application of environmental inspections programs favoring the developer, MVP has racked up 450 official water quality violations across the Virginias - that's in just the 36 months during which it had permits.[10]

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[5] *See* "A Decade in Review: 2010-2019 Are we progressing toward the goal of zero accidents?" (Pipeline Safety Trust, July 22, 2020, William Caram and Carl Weiner; *See also "Gas pipelines explode. How far away is enough to survive?"EENews, 1/24/23, by Mike Soraghan) (Text attached.)*

[6] https://www.politico.com/newsletters/power-switch/2023/01/24/the-next-debate-on-pipeline-safety-00079194 *See "* The next debate on pipeline safety", Politico*, 1/24/23, by* Arianna Skibell, (citing a 2022 study by public interest group U.S. PIRG Education Fund.)

[7] https://roanoke.com/news/local/mountain-valley-pipelines-permit-to-cross-streams-in-west-virginia-faces-legal-challenge/article_f124b266-54ab-11ed-8f96-53e93f1c6701.html
https://www.eenews.net/articles/court-poised-to-block-key-mountain-valley-pipeline-permit/
MVP construction "crossings" are numbered at 429 in FERC Accession No. 20210603-5141_LRH 2015-592-GBR-Exhibit 2.PDF eLibrary | File List (ferc.gov) . Upon information, there are 236 streams in Virginia and 193 in West Virginia which MVP has yet to cross.

[8] On August 11, 2022, West Virginia's Department of Environmental Protection issued a Notice of Violation against MVP for visible sedimentation to state waters in an unnamed tributary of Stout Run in Wetzel County, as well as citing two violations of the Stormwater permit. These water quality violations occurred because MVP's "best management practices proved ineffective at controlling sediment during trench dewatering." *See Letter, October 14, 2022, Appalachian Mountain Advocates to Patricia S. Connor, Clerk of United States Court of Appeals for the Fourth Circuit.*

[9] Hileman, J. Ph.D., Comments in Opposition to MVP Request for Extension, FERC CP16-10, Accession No. 20200909-5054. eLibrary | File List (ferc.gov) .

[10] By the Numbers: Mountain Valley Pipeline, 1/31/2023, sierraclub.org

In assessing the MVP, we respectfully ask the NFS to consider:

> *~The DSEIS fails to account for severe risks to water, land and wildlife immediate touching the pipeline's path though the 3.5 miles of JNF, thus threatening forest integrity and exposing local, frontline, and environmental justice communities to an array of environmental harms and losses. MVP is double over budget and years beyond deadline.*
>
> *~The DEIS Section 3.2.2, Public Health and Safety, states that: "The Effect on Public Health and Safety within the project area would be similar to those analyzed in the 2017 FERC FEIS…and the 2020 FSEIS." We ask the NFS to recognize this statement is incorrect.*
>
> *~The DSEIS makes no mention of those hazards to pipe long stored outside across the right of way (ROW), and in storage yards. The DSEIS further fails to discuss mitigation measures, including but not limited to inspection, remediation procedures for corrosion and degradation of pipes, or replacement of coating and pipe which now presents mortal danger to the public.*

Problem pipe coatings

MVP now presents exponential danger to people and the environment, with explosion risks from long - neglected infrastructure because of the LLC's aggressive movement of pipes to ROW, and neglectful and improper storage of pipes on ROW, as well as in open air storage yards.

We describe here a high level of scientific and public concern regarding extended exposures to ultraviolet light and other elements of Southern Appalachian climate suffered by MVP pipe, stored outdoors as early as 2016, and at least since procurement in 2017, in open air storage yards and on construction sites throughout the entire MVP ROW. The attached photographic Exhibits A, B and C are examples of the *route wide* presence of deteriorated pipe coatings and otherwise damaged and degraded pipe – as are the images set forth in the video titled and "Degraded MVP Pipe in Monroe County, West Virginia" (link in footnote below).[11] Together with federal court testimony set forth below, the photographs show MVP's intention to utilize pipe which is *known by industry*, *including MVP,* to possess an much higher potential for explosion than newly produced and freshly coated pipe.

MVP pipe has been exposed to the degradation of weathering elements and other impacts from between one (1) to six and one half (6 ½) years beyond the industry standard. Certainly the Forest Service, together with other state and federal agencies, originally permitted the gas pipeline in contemplation of construction with *new and freshly coated* pipe. That all parties and agencies fairly assumed MVP pipe would be swiftly buried - upon the court's granting of "early entry/quick take" to build - is borne out by MVP officer testimony in federal court evidentiary hearings in Virginia and West Virginia in January and February 2018. (*See below,* **MVP Senior Officer Testimony.)**

[11] Degraded MVP Pipe in Monroe County, West Virginia , Video by Paula Manns of Monroe County, West Virginia. *See also* "Mountain Valley Pipeline: Old Pipe Poses a Danger", by West Virginia Rivers. https://www.youtube.com/watch?v=CHf441PiPwU .

Appalachian Mountain terrain already presents a high probability for pipeline explosions in steep slopes, landslide prone soils and documented seismic zones.[12] Coating degradation and corrosion promise to accelerate and increase the risk of explosion. Based upon assessment of government data over a decade ending in 2020, the Pipeline Safety Trust (PST) noted an increase in significant failures in pipelines transporting fracked gas and other fossil fuels, highlighting that *one fifth of all pipeline failures are caused by corrosion.* Despite advancements in technology, serious accidents on fracked gas transmission lines *increased* over the course of the decade from 2010 through 2019, leading pipeline safety advocates to question, "[a]re we are progressing toward the goal of zero incidents?"

Noting the uptick in fracked gas explosions, PST highlighted that *"[t]hese types of pipelines also tend to be where the greatest harms to people occurs in terms of deaths, injury and property damage."* [13]

MVP's repeat environmental violations, offenses, permit failures - and consequent construction delays - have generated continued degradation and corrosion, with years of exposure to Southern Appalachian rain, wind, heat, humidity and not least of all, ultraviolet (UV) light.

Fusion Bonded Epoxy Coating - "Chalking"

Pipeline industry professionals have long understood that fusion bonded epoxy coating like that used on the MVP degrades when exposed to ultraviolet light (UV), leading to catastrophic gas leaks, explosions and fire.[14] The National Association of Pipeline Coating Applicators ("NAPCA") standard for UV exposure states: "**Above ground storage of coated pipe in excess of six months is not recommended."** Without additional protection from UV light and other weathering elements including moisture, epoxy pipe coating can lose thickness and develop thin spots known as "holidays". Exposure to the elements can cause embrittlement, or "crackling", and loss of adhesion or "disbondment" - the separation of coating from the steel pipe wall. All these weaknesses allow exposure of steel to moisture which result in corrosion - a leading cause of pipeline failure.

Recognizing the already high risk of pipe damage under common construction stresses of lifting, torque, and other impacts to pipe in the regular course of construction, the combined effects of a hot, moist southern climate in the United States have been documented as rendering the pipe **"unfit for use".** While MVP publicly attempts to mollify its investors, agencies, courts and the

[12] As recently as July 15, 2021, a 2.8 earthquake, 20.4 km/12.6 miles deep, along Sugar Run Mountain, about 6 miles/10 km south of the town of Narrows in Giles County, Virginia.
https://www.wfxrtv.com/news/local-news/new-river-valley-local-news/did-you-feel-it-small-quake-shakes-giles-county/
https://earthquake.usgs.gov/earthquakes/eventpage/se60349277/executive

[13] *See* Pipeline Safety Trust Study, William Caram and Carl Weiner, July 22, 2020; A Decade in Review, 2010-2019, p.1-11. "From a pipeline safety viewpoint this was a decade we would like to forget", p.1, 11.

[14] *See* Letter, Richard Kuprewicz, President Accufacts, Inc., to Jaqueline Prang, Natural Resources Defense Council, October 11, 2020, p. 1.

public with statements like "a change to a whitish green color is "normal",[15] industry experts who have critically analyzed the evidence indicate that what MVP describes as normal is also *deadly*.[16] **The longtime understanding of industry experts is that if the thin outer layer of protective chalked coating is removed by intense periods of direct exposure to the elements such as wind, rain, and UV exposure such as that in the Southern United Sates, then the new surface starts to suffer from the repeated process of chalking. Field studies in 2001, 2003 and 2020, confirm that as this breakdown and delamination of the outside layers continue, it is accompanied by a noticeable reduction in coating thickness.[17]** This creates the very real dangers which threaten the public and the environment, including waters for which the Forest Service has responsibility.

Contrary to MVP's bald assurances to federal agencies and the public regarding coating thickness, the LLC's FERC filings show the company was well-informed of its own pipe coating inadequacies by manufacturer 3M. As far back as 2018-perhaps in response to a shower of public scrutiny regarding pipe coating immersed in water-filled trenches on construction sites - 3M produced a Safety Declaration, reiterating that when the *thin* outer layer of chalking "maybe **1-3 mils** deep," is removed, by weathering or other impacts, then "photodegradation keeps going, and the pitting gets deeper, which is why the 3M technical guidance recommends *not* to remove the chalking."[18](emphasis added) While 3M offered the above *range of potential chalking depth*, TC Energy-Keystone XL pipe analysts Keith E. W. Coulson and James Ferguson have estimated a *rate of loss* - an average of **25.4 microns per year** (25.4 microns equal one mill) occurred on the KXL, UV-exposed non-whitewashed pipe.[19] Considering loss of coating thickness over time and conditions, MVP's original chalking layer, thus exposed to weathering and other impacts for up to 7 years, would have worn off quite significantly, with the above-described degradation, or "pitting," having ensued early on in the life of the pipe coating as it degraded above ground.

"This phenomenon is common to all FBE coatings that are primarily designed **only** for **below ground service**," noted Coulson and Ferguson. (*emphasis added)* Indeed, in assessing the KXL coating problems and the "polymer degradation commonly referred to as chalking" they described that "[i]n all instances of direct FBE coating exposure to UV, there exists a reduction of the coatings' original flexibility", "embrittlement" and "loss of adhesion…".[20]

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[15] WDBJ7 News, Roanoke, Virginia, October 18, 2022. https://www.wdbj7.com/2022/10/18/mvp-opponents-focus-attention-exposed-pipe/

[16] Journal of Corrosion Management Jan/Feb 2021, p 21, *citing* Coulson, Keith E W, Ferguson, James, Journal of Corrosion Management No. 153, Jan/Feb 2020, Kerr, Alan J., Fusion Bonded Epoxy, NACE International Houston, Tx, 2003; Cetiner, Matt, et al, Stockpiled FBE Coated Line Pipe Can Be Subjected to UV Degradation, Oil and Gas Journal, April 16, 2001.

[17] *Id.*; Journal of Corrosion Management, Coulson and Ferguson, Issue 159, Jan/Feb 2021, p. 1.

[18] *See* Letter, Assistant general Counsel Matthew Eggerding to FERC, Acc. No.20210721-5100, eLibrary | File List (ferc.gov), and MVP's Attachment B, Material Declaration, by Manufacturer 3M, Electrical Markets Division, Andrew Morabu, 3M Product Responsibility Liaison, October 23. 2018.

[19] *See* Journal of Corrosion Management, Issue 153, Jan/Feb 2020, p. 18.

[20] Coulson and Ferguson, 2021, p.1.

Field observations, photos,[21] aerial images, and MVP reports to FERC all confirm that thousands of MVP pipe segments have suffered from UV, weathering, and common construction impacts and exposures for approximately **one to seven years**—potentially **over thirteen times the acceptable above-ground exposure time as stated by industry, per NAPCA**.[22]

MVP Senior Officer Testimony

MVP has provided sworn testimony that its 2016 and 2017 pipe was in storage yards as of procurement in 2017, before FERC certificated the project.[23] The company apparently began its practice of moving pipe to construction sites in 2018, repeatedly ignoring the facts of agency process and the prospect of permit litigation including hearings in which the limited liability corporation stood the chance of losing permits to construct.[24] Having habitually failed to comply with the law and regulations, the company is now missing several permits. Degraded pipe coating, chalking, gouged, pock marked, floated, tumbled, and torqued pipes now sit across 300 miles of ROW. MVP's defective pipes are (1) resting on rotting wooden cribs and directly on ground, bordering streams, (2) soaking in wetlands and "ponded" areas, and (3) perched on slopes, some ends covered by cloth or metal - but many uncovered for long periods, taking on water in some form, and corroding inside and out.

MVP Senior Vice President of Engineering Robert Cooper testified in federal court eminent domain "quick-take" hearings in Roanoke, Virginia, and Charleston and Clarksburg, West Virginia in January/February 2018. VP Cooper testified that the pipe coating could withstand only up to one year's ultraviolet exposure from sunlight, and that re-stacking the pipe and/or additional temporary coating was required beyond one year.[25]. Based upon those statements, MVP's full stock of pipe, coated in 2016-2017, must now be presumed *"unfit"* by industry standards. In Roanoke, Cooper swore to the following:

> ***There are some other things that are kind of unique to this project, one of which is the pipeline material. The pipeline is coated with protective material. It's an epoxy. As it sits in the sun, it ages or oxidizes and becomes thinner. And so we have to continue to monitor that and inspect it. And prior to it becoming, well there's some margin when you coat it, but prior to it becoming too thin to use, you have to protect it from the sun. And that includes some sort of additional coating, or the other thing you can do is restack the pipe.***

[21] Photos attached as: Exhibit A, MJ 2.1.23 Photos (Lindside Storage Yard); Exhibit B, Pipes Brush and Sinking Creek Mountains, JNF 2.6.23; and, Exhibit C, PBM PPT, Pipe Coating and Safety Issues, Franklin Co. 11.29.22

[22] National Association of Pipe Coating Manufacturers (NAPCA), Bulletin 12-78-04, re: fusion bonded epoxy (FBE) application and abrasion resistant overlay (ARO).

[23] Clarksburg Eminent Domain Transcript, *Civil Action No. 1:17-CV-211, (NDWVA, Jan. 23, 2018),* pp.122-23, Roanoke Eminent Domain Transcript, *Civil Action No. 7:17-CV-492, (WDVA, Jan. 12, 2018),* p 134; Charleston Eminent Domain Transcript, *Civil Action No. 2:17-CV004214 (SDWVA, Feb. 7, 2018) p. 61.*

[24] This is inconsistent with industry practice of moving pipe to sites only upon appropriate site preparation. To coordinate pipe transport with trenching would be consistent with the NAPCA warning, *supra,* that epoxy coatings on pipe should not suffer more than 6 months exposure to UV light.

[25] Roanoke Tr. 134, Clarksburg Tr. 124-5, Charleston Tr. 61.

It's kind of like turning over when youre [sic] sunbathing…because the coating needs to be protected you have to do that very carefully.

And the pipe that would need to be restacked… should we get this delay [a judicial denial of MVP's request for "early entry" to build before determination of easement payments to landowners by trial or negotiation] the physical cost of handling it to restack it is about one million. So that's an example of additional costs that occur if we get delayed.[26]

In the Charleston federal district court before the Honorable John T. Copenhaver, Jr., Cooper testified:

One, one thing that does occur is the pipeline has an epoxy coating on it, and it has an -- it oxidizes in the sun. And so, the longer it spends in the sun, you must protect that. And so, delay for a year, we'll either have to re-coat some of the older pipe or we'll have to restack it to make sure that the overall integrity of the coating is maintained prior to its installation.[27]

In the Clarksburg federal court, Senior VP of Engineering Cooper testified on this subject in MVP's efforts to secure additional properties. Immediately following description of storage yards (as opposed to warehouses which would keep pipe out of UV rays), Cooper told the Honorable Irene M. Keeley, Senior Judge of the Northern District of West Virginia in Clarksburg:

There is the issue with the pipe and some of the pipe will actually need to be restacked because as its coating is exposed to the air and it will degrade to it was procured to be installed, so now that will have to be protected, some portions of it that were the early [older pipe] orders, so you've got to restack the pipe or provide a temporary coating.[28]

Importantly, Cooper testified in response to landowner counsel's questions on cross examination as to MVP's knowledge and understanding of the *risks of the early procurement of pipe* and other contracts, long before *any* eminent domain lawsuit was filed, and before federal court had ruled upon early entry. MVP's admittedly *foreseeable risks* would include such things as potential court denials of MVP early entry motions, landowner unwillingness to sell easements, federal agency permit litigation and FERC and DEQ/DEP Stop Work Orders, as well as contractor crew availability for work at later dates. Astoundingly, MVP made pipe procurement orders and contracts for work crews without ever discussing crew availability to start at dates *later t*han the "early entry" dates of March 2018.[29] Landowner counsel further inquired about MVP's decision to ignore their proposed options which would allow MVP to mitigate costs of delays in the event the courts denied MVP's early entry request - including MVP's potential costs for warehouses for construction equipment and storage yard rents for pipe which was procured by MVP - all before the company had even filed the eminent domain suit:

[26] Roanoke Tr. 134.
[27] Charleston Tr. 61.
[28] Clarksburg Tr. 124-5.
[29] Roanoke Tr. 120.

Teaney: ***You wouldn't have incurred these costs if you had opted to implement either of the (defendants' proposed mitigation) schedules… would you? …you're testifying that your incurring [40 million dollars] in order to implement your preferred schedule [of "early entry"] is that correct?***

Cooper: ***Yes, sir.***

Teaney: ***So you assumed the risk pretty early on in this project that these materials might sit around for a while and have to be warehoused, didn't you?***

Cooper: ***Yes, sir.***

Teaney: ***You did that well before you had any surety that FERC was going to issue its Certificate in October of 2017, didn't you?***

Cooper: ***Yes, sir.***[30]

Under the NAPCA industry standard for coating UV exposure limits of *six months*, MVP pipe has now suffered UV exposures for up to *thirteen times over* the safe limit.[31] The NAPCA standard is consistent with Coulson and Ferguson's explanation of chalking of fusion bonded epoxy (FBE) coating meant for *only* for *below ground use* - meaning the pipe required burial soon after it was loaded to sites.

VP Cooper testified further in that MVP procured all its pipe even *before* FERC certificated the project in October 2017. He confirmed that, even as he testified in Clarksburg, that some MVP pipe was in transit to nearby open-air storage yards.[32] In the company's efforts to secure "quick-take", (early entry to build before paying landowners a fairly negotiated or jury determined price for easements), Cooper told the Court that if the pipe had to be kept in storage yards for months upon a court denial of "quick-take," it would increase MVP's expenses considerably, at the cost of one million dollars (apparently one million per event), to "shuffle" the pipe.[33] Cooper assured the Clarksburg judge of his fifteen years in the fracked gas pipeline industry, including various roles in *procurement and safety* - and repeatedly affirmed that MVP "***assumed the risk***" of what would come of its full stock of pipes as the company aggressively transported it to local storage yards, as the Court heard evidence.[34]

Obviously aware of the need to swiftly bury its pipe coated with 3M 6233, VP Cooper testified the pipe *"was procured to be installed*." Notwithstanding that, MVP ***chose to risk pipe degradation*** by rushing its pipe to storage yards with no assurance that sites could or would be timely prepared, without all avenues to construction -such as federal court orders.

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[30] Clarksburg Tr. 172-75.

[31] Roanoke Transcript, page 134; Charleston Transcript, page 61; Clarksburg Transcript, pages124-5; See Preserve Bent Mountain (PBM) photos of coating dates December 2016. Field observers have not yet documented pipe coating dates older than 2016; nor have they documented any *younger than 2017.*

[32] Clarksburg Tr. 173.

[33] Clarksburg Tr. 124-5.

[34] Roanoke Tr. 97-98, Charleston Tr. 9, Clarksburg Tr. 172-75.

Consequently, MVP's pipe has laid upon the ROW, exposed to UV and other elements, for years.

MVP - FERC Information Response:

After MVP had secured early entry to build in 2018, Vice President for Construction and Engineering Jeffrey Klinefelter signed a July 30, 2019, Response to a FERC Information Request regarding pipe coating concerns. He wrote that MVP had satisfied safety practices by evaluating its stored pipe in 2017 and taking the "proactive step of shuffling the pipe in stacks…" he added that "MVP will employ this measure *as necessary* until all pipe segments are installed." (emphasis added) [35]

Klinefelter's 2019 statement confirms nothing but that MVP asserted that pipe shuffling would take place at its own *discretion* - a careful reading of his representations clarifies that MVP flatly failed to confirm that the company shuffled *any* of its storage yard pipe since the summer of 2017 - before FERC certification.

We are aware of no evidence, in the FERC record, by other documentation, or by site observations, that MVP ever attempted protection of pipes by whitewash or tarping on any of its pipe, whether stored across the ROW or in stockyards.

MVP Risks, Warnings and Tragedies

Particularly in light of the risks that MVP assumed in procurement practices and in federal testimony, landowners and their communities already subject to eminent domain abuses under the Natural Gas Act should not be burdened with the exponential increase in the risk of death, injury and destruction from MVP explosions and fire. The following discussion of blast zone definition is significant for the public, and for its public servants, to understand. The risk to our communities is now far more dire than envisioned in current planning and construction efforts. Presently, the PHMSA-defined potential impact radius ("PIR") for MVP, under **pressurized pipe of 1,480 pounds per square inch**, is **at least 1115 feet in every direction** from any future rupture site on the pipeline. (Potential impact radius is an antiseptic term for what is also known as "incineration zone, and "blast zone.") *But recent press indicates that the blast zone has been undercalculated - for over two decades.*

In **"Gas pipelines explode. How far away is enough to survive?",** reporter Mike Soraghan describes several accidents occurring since a blast zone formula of **600 feet** was implemented by PHMSA in 2004.[36] (Article linked in footnote 33 and attached as Exhibit D).

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[35] MVP Response to Preserve Bent Mountain, FERC Accession No. 20210721-5100 (attaching Klinefelter Statement July 30, 2019, 3M Declaration and Promotion Materials.) MVP does not appear to have attempted to mitigate its pipe coating degradation, for pipes on sites at the time, ignoring industry guidance and practice that epoxy coated pipes should be whitewashed every two years. *See* Corrosion Management '21, Conclusions from Canadian Study, p. 25.

[36] https://www.eenews.net/articles/gas-pipelines-explode-how-far-away-is-enough-to-survive/

In an accident occurring in the year **2000** in Carlsbad, New Mexico along the Pecos River, an extended family of 12, linked by marriage and grandchildren, died in the flames of an explosion some **675 feet** from their campsite. The dead included 6-month-old-twins, Timber and Tamber.

How, in the wake of this and other horrific pipeline accidents did PHMSA, in **2004,** choose to use an industry-commissioned formula to determine the *blast, incineration*, *hazard zone - the potential impact radius?*

Industry-influenced calculation

It appears that 2004 PIR was written to favor the gas industry - it was "simple" and "preferred" because it came up with a PIR with a smaller radius than other models. Mark Stephens, the engineer who, along with C-FER Technologies were hired by the "Gas Research Institute", now GTI Energy, devised the formula, said he factored in some assumptions …assumptions that the scientific community might question - such as the "incomplete combustion of gas," and that "heat would be absorbed by atmosphere" before reaching a perishable human body. Indeed, the human survival rate under the industry blast zone calculation is based upon some cruel assumptions - among them , that the potential blast victim can 1) *decide* within 5 seconds to flee, then 2) *run* at about 5 mph for 25 seconds, and 3*) find shelter* within 200 feet. Within that crucible, there exist at least a half dozen variables that could easily condemn the unwitting blast victim to death or serious, permanent, bodily injury and disfigurement.

Royce Deaver, a pipeline consultant with over 33 years' experience with Exxon, has criticized the ruse that created the 2004 blast formula "a fantasy story…" He explained what has become commonly understood in challenging dangerous pipelines - that regulators have long relied on industry resources because of government underfunding…and that PHMSA chose, way back in 2004, to use the *industry - contrived formula in order to avoid pipeline company opposition.*

The National Transportation Safety Board ("NTSB") recently directed PHMSA to update the PIR formula, as several explosions like that in Carlsbad, regardless of pipe width, easily reached by blast effects beyond 600 feet. Within that, PHMSA has studied 17 pipe explosions between 2017 and 2022. The actual impact area exceeded the PIR in three of them.

In a 2019 fatal Danville, Kentucky explosion, one **person was killed, four were injured, five homes were destroyed, fourteen homes damaged, and thirty acres of forest burned** - the unanticipated damage from the explosion extended farther than the agency-approved calculations. The NTSB investigative report on developer Enbridge's fatal explosion on its **30-inch** natural gas pipeline found that a "hard spot" in the coating and degraded coating led to "cracking" causing explosion, also finding that cathodic protection proved ineffective in prevention corrosion and consequent explosion. In its Report on the investigation, the NTSB highlighted that PHMSA's "PIR" or "blast zone" is inadequate, and that current planning and design of large pipelines put our communities in harm's way - even more so than first predicted.[37] .

[37] NTSB Press Statement on Danville, Kentucky 8/1/19 explosion, https://www.ntsb.gov/news/press-releases/Pages/NR20220914.aspx **;** https://www.wdrb.com/news/ntsb-releases-final-report-in-2019-lincoln-county-pipeline-explosion/article_257f7604-3495-11ed-bcd8-f3df5b2883ae.html

Thirteen years ago in San Bruno, California in 2010, the **30-inch pipe** involved in the San Bruno, California explosion killed **9 people**, **injured 60**, left a crater 72 by 60 feet wide, propelled a 3,000-pound pipe segment about 100 feet through the air, and produced a 1,000-foot high fireball.

Explosion of the **42-inch, 1480-psi MVP** would dwarf the San Bruno explosion. Knowing this, how or why would any public agency allow MVP to proceed to build within a stone's throw of the neighbors' kitchen window? Perhaps, as Royce Deaver said, because ***"[t]he pipelines control the cost and the benefit..."***[38]

Meanwhile in PHMSA, in early 2021, an agency audit indicated a significant portion of the staff at PHMSA opined that the federal agency was too close to industry, echoing decades of concern from safety advocates and some legislators.[39]

Geohazards and Water

Seismic zone. MVP pipe coating and corrosion issues are compounded by steep slopes and other geohazards documented seismic events, the proven instability of karst topography and highly erodible soils. A 2.7 magnitude earthquake occurred in Giles County, Virginia in July 2021.[40] Prior to that in September 2017, an earthquake measuring between 3.7 and 4.0 occurred in Monroe County, West Virginia. The epicenter was within 5 miles of the proposed MVP ROW in the JNF and below the proposed bore pit at the crest of Peters Mountain, traversed by the Appalachian Trail.[41] To date, according to Martin Chapman, Associate Professor, Virginia Tech Department of Geosciences, earthquakes in Giles are common, with over 200 on record thus far.

The Giles Seismic hazard zone extends through Roanoke County, including Bent Mountain. Fault lines have been identified throughout the area of Poor and Bent Mountains though which the MVP ROW traverses.[42] It is not at all clear how minimal an earthquake could rupture the MVP, particularly if pipe in present condition is buried in weakened and corroding condition.

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https://www.naturalgasintel.com/fatal-tetco-incident-in-2019-said-combination-of-pipeline-defect-degraded-system/ MVP is expected to operate near Maximum Allowable Operating Pressure (MAOP). Peer reviewed research establishes a clear relationship between large pipe diameter of high probability of rupture and pipe diameter. *See Hileman, J., Ph.D., Chart, Narrative Estimating the Probability of Ignition for Mountain Valley Pipeline.* For reference, note that where MVP's MAOP is 1480, well above average, Penn State available online information indicates *average* operating pressures on natural gas transmission pipelines at between 800 and 1200 psi. *See* Extension.psu.edu, Understanding Natural Gas Compressor Stations, March 26, 2015.

[38] EE News, *supra at 2.*

[39] PHMSA Staff concerned about agency-industry ties," E&E News, 1/19/21, by Mike Soraghan (attached). The audit found that 35 % of employees responding to the survey disagreed with the statement that "PHMSA makes decisions free of undue influence." 36% agreed and 29% stated their neutrality. https://roanoke.com/news/local/most-signficant-earthquake-in-decades-shakes-parts-of-new-river-valley/article_0f4233cf-afee-5493-8c46-c59ab75ad8bb.html.

[40] https://wset.com/news/local/small-earthquake-rattles-giles-county-narrows-virginia

[41] https://roanoke.com/news/local/most-signficant-earthquake-in-decades-shakes-parts-of-new-river-valley/article_0f4233cf-afee-5493-8c46-c59ab75ad8bb.html

[42] See Dodds, Pamela C., Licensed Professional Geologist, Report for Roanoke County Board of Supervisors, Dec. 2016.

Karst. Compounding the issue of earth movement is karst, from Monroe through Roanoke Counties, through which unknown volumes of water flow through caverns and sinkholes which are continually growing and changing.

Landslides. While FERC's Environmental Impact Statement identified 5,053 acres of soils with the potential for severe runoff, critical analysis reveals far more concerning numbers. MVP crosses **203.4 miles of high landslide risk areas, which is 67% of the total length—far more than any other large gas pipeline that FERC has approved since 1997.** [43] MVP has reported dozens of landslides many of which it calls "slips", in which the slope and the area off-ROW had been impacted. In one case, a home below the slope was determined to be "unsafe to be occupied".[44] Many landslides within the ROW remain untallied and are continuing. FERC reports from April 2020 indicate pipe itself has already moved in slides in three separate locations, in Lewis County, West Virginia. "[T]he fact that the FERC report mentions three different sites" raise questions as to whether "there is a possible systemic issue for the pipeline and its right-of-way," observed pipeline safety consultant Richard Kuprewicz. He described a "slip" or "land creep" as often caused by "poor water management on sloped land," in which rain "starts to liquefy the soil and gravity never shuts it off." [45] In another incident, pipe stored slipped down the slope of Brush Mountain in Virginia about forty feet. Agencies have been repeatedly informed of Bent Mountain's highly erodible, landslide prone soils. *See below,* "**Agency misunderstanding…"**

Steep slopes. Hydrologist Jacob Hileman, Ph. D., notes that **MVP crosses 75.4 miles of steep slopes, about one quarter of the length of the MVP.**[46] An inordinate mileage of work remains in MVP Spreads G and H, from Giles though Franklin Counties in Virginia. This area of the MVP ROW is home to some of the steepest slopes, and some of the longest stretches of steep slopes, along the entire route - potentially the most technically challenging, and the most environmentally sensitive. Hileman notes 29.8 percent of slopes in Spread G have steep slopes over *30 percent grade.* "Even more troubling, he writes, "*2.7 of these miles are comprised of steep slopes greater than 50 percent grade.*" Hileman warns further that "[o]n Spread H, 10.8 miles of the 31.6 miles spread - that is 34.4 percent of the spread's total length - have steep slopes greater than 30 percent grade. *Alarmingly, 2.9 of these miles are comprised of excessively steep slopes greater than 60 percent grade."*

Agency misunderstanding and its potentially deadly import: The potential for agency misunderstanding of slopes data was highlighted in the Virginia State 401 permit hearing before the Water Control Board during which the Director of Water Compliance told the Board that:

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[43] *See* Jacob Hileman, Comments in Opposition to Motion for Extension, CP-16-10, FERC Acc. No.20200909-5054, and Comments in Opposition to MVP Motion for Extension, CP16-10, Accession No. 20220728-5073, eLibrary | File List (ferc.gov) .

[44] See MVP "Uniquely Risky". https://www.nrdc.org/experts/amy-mall/mountain-valley-pipeline-uniquely-risky .

[45] Roanoke Times, Laurence Hammack, https://roanoke.com/news/local/report-of-pipeline-slips-in-west-virginia-under-investigation-raises-concern/article_05d9ea1e-8944-5a10-a9e9-acad9d709e92.html; https://roanoke.com/news/local/mountain-valley-hits-another-snag-in-its-pipeline-plans/article_b4daa376-8b69-11ec-a5b3-e34446874bba.html

[46] *See* Comments in Opposition, Hileman, *supra*, p. 9, Sec. (b) Steep Slopes >30%, Figure 2.

"…[A]s things move past Roanoke, the topography starts to flatten out, especially when you get past Bent Mountain…We're in much more of a –and[sic] agricultural landscape, rolling terrain, less forest cover which has been a little easier to work…"[47]

The Virginia DEQ Water Compliance Director's misunderstanding cannot be considered minimal or insignificant -it requires clarification for all agencies. Poor Mountain straddles the Montgomery and Roanoke County lines from Elliston though the town of Bent Mountain. MVP would cross the Blue Ridge Parkway, then several long, steeps slopes in Franklin County before its harrowing descent from Adney Gap Mountain. Burrowing under the North Fork Blackwater, and Adney's "bookend" slope at Dillons Mill, the mega-pressurized pipe would traverse at least two more long, steep slopes framing a tributary to the North Fork Blackwater, before reaching the communities of Wades Gap and Webster Corner. MVP crosses then several steep slopes which form the "shoulder" of the venerable Cahas Mountain. While not crossing the crest of Cahas Mountain (protected by conservation trust,) the pipeline traverses two long, separate slopes and several pristine creeks and wetlands of Cahas Mountain Road. One environmentally damning landslide occurred in the first months of construction here. Contrary to VADEQ's account, MVP's construction sent a mudslide off the steep slope, across the country road and into a headwater stream of Little Creek—almost certainly choking everything that lived in it.[48] The above doesn't cover all natural hazards occurring before MVP arrives even halfway through Franklin County. It seems enough to say, however, that these slopes have suffered too much. Rural families here, several of whom have a few hundred years of history here, depend upon the land, surface- and groundwater, for sustenance, livelihood, enjoyment and solace.

At least two, possibly three, families live within the "blast zone" as MVP drops off Adney Gap Mountain, cuts a hairpin turn north, across the farm field and the pristine headwaters of the North Fork Blackwater, which flow from this isolated hollow below the Blue Ridge Parkway. An explosion across this road and waterway, or upon either mountain, could cut off Dillons Mill Road, the only safe vehicular passage out, for families living further up the hollow.[49] Explosion could also impact egress for residents of the steep, single lane Adney Gap Road.

Locals familiar with Sinking Creek Mountain describe the pipeline route as passing proximate to sinkholes, then up a radically steep slope, nearly vertical in places. They describe a mountain that seeps water year-round, creating bogs, fens, wetlands, and intermittently wet places of the highlands. The process of freezing and thawing of which threaten to lift the earth away from the mountain, the soils and rock of which have already been disturbed by MVP activities in the ROW, before construction was stopped for MVP's various failures and offenses. In addition to

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[47] State Water Control Board Mtg., Dec 14, 2021, Transcript, p.181. Office of Water Compliance Director John McCutcheon.

[48] ***See photo, "***Construction halted at Mountain Valley Pipeline Worksite following severe erosion in Franklin County, May 20, 2018, Laurence Hammack. https://roanoke.com/business/construction-halted-at-mountain-valley-pipeline-work-site-following-severe-erosion-in-franklin-county/article_2eeebd3a-5007-56b0-9469-3e381b09b668.html

[49] Hileman, Steep Slopes Charts; *see also final photo in Exhibit C, Adney Gap Slope, Preserve Bent Mountain Power Point. Adney Gap slope as seen from approximately bookend slope at Dillon's Mill, Callaway, Virginia.* Comment in Opposition to Extension, Accession No. 20200920-5054, Fig. 2 and Table 1. Out of 303 miles, MVP has 75.4 miles of steep slopes ("steep" defined as greater than 30%.)

creating a waste of pure seep water for users below; it risks soil instability - and thus the stability of the pipes.

Observers have documented pipe exposed to elements on Sinking Creek Mountain for several years.[50]

FERC's FEIS has recognized that the largest debris slide in the Eastern North America is located along the MVP corridor on Sinking Creek Mountain which also includes the JNF and the Giles Seismic Zone.[51]

These communities require state and federal agencies to not only understand MVP's environmental topography, but equally as important, to understand local demographics and principles of Environmental Justice.

Elevated Operating Temperatures

One risk not often discussed in relation to MVP is that of *elevated operating temperatures*, such as those operating on the KXL. Pipeline Safety expert Richard Kuprewicz notes that "[m]any gas transmission segments (usually downstream of compressor stations) can exhibit elevated operating temperatures, such as those that will occur on the Keystone XL Pipeline, possibly accelerating corrosion threats."[52] The added risk at and near compressor stations potentially sited near steep slopes, thus would multiply the risks to already heavily impacted environmental justice communities along the MVP, such as those who have been threatened by MVP plans for compressor stations, for example, in Elliston and Chatham, Virginia.[53]

Contractor Concerns

The geohazards inherent in MVP's desktop-designed route are further compounded by MVP's risky choice of contractor, Precision Pipeline. MVP chose Precision Pipeline, which was the contractor for the Stonewall Gathering Pipeline, fined by Pennsylvania regulators for sediment laden water contaminating streams, and farm fields, and for "an open dump" along the pipelines route where waste including drill cuttings was disposed. Precision had another issue involving Mariner East 2, in which a Notice of Violation for the accidental release of drilling fluid and other industrial waste into wetland. Similarly, with Precision as contractor, Rover Pipeline received a fine of $95,366 for stream sedimentation —all resulting in a Stop Work Order in West Virginia in July 2017.[54]

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[50] See Photos of Sinking Creek Mountain at Exhibits B & C.

[51] FEIS, pp. 4-45, -46.

[52] Letter, Richard Kuprewicz, President, Accufacts to Jaqueline Pranger, Natural Resources Defense Council, Inc, October 1, 2020.

[53] https://roanoke.com/business/pipeline-project-watchdogs-anticipate-arrival-of-compressor-station/article_db599258-4353-5842-818e-f6ce23048431.html
https://www.chathamstartribune.com/news/article_898c4090-5850-11ec-84b3-f33e24b16d14.html

[54] *See* "MVP's contractor ran into environmental problems during construction of pipelines", February 7, 2018, by Laurence Hammack, https://roanoke.com/news/local/mvps-contractor-ran-into-environmental-problems-during-construction-of-other-pipelines/article_d6c10d6a-b586-568a-8621-ac58177e3084.html

Inspections "Conflicted"

Recent press reports indicate that MVP would have regulators and the public accept that its pipes on construction sites are somehow sanctified upon burial by an eleventh-hour check by inspectors whose work is already suspect, based upon conflicts of interest.[55] Counsel to FERC has most recently described concerns regarding multiple layers of financial conflict involving environmental inspections company Cardno, recently purchased by larger environmental inspections company Stantec. Per FERC counsel, Stantec's involvement in multiple projects for various partners in the "small but continuing" conflict. FERC counsel seemed to rationalize that because Cardno has inspected for MVP from the beginning of the project, the conflict was somehow insignificant and excusable. To the contrary -the length of time in the project and the volume of "passes" Cardno afforded MVP in "problem" and "violation" calls renders a *big* conflict even bigger. The Roanoke Times reiterated what the public has noted for years - that the system by which Cardno is paid put Cardno in conflict from the beginning. MVP funds the paychecks that Cardno inspectors receive from FERC.[56] How is the fact that Cardno's paychecks are funded by the company it's supposedly inspecting, *not* a conflict of interest?

Problems abound in inspections training and practice as they relate to financial conflicts of interest. One example is the discrepancy between MVP's stated safety practices, the hard evidence of degraded coatings and damaged pipe stored along the ROW, and bona fide assurances of best practices in pipeline safety that should apply under these circumstances. MVP's representations of last minute, trench-side inspections on pipes that are clearly degraded and damaged are not credible. Real data and information on pipeline inspections is reported to be elusive - as in a "black box."[57]

These trench-side inspections on MVP, a 42-inch pipe operating at 1480 pounds of pressure per square inch, are accomplished by a handheld "*holiday detector*" - a grossly subjective, inconsistent, and insufficient way to test pipe for coating damage and corrosion. Such a process, all circumstances considered, may be little more than a last-minute "lick-and-a-promise" by MVP as its crews drop pipe in the trenches—again misleading the public by its lip service to public safety. MVP's system as advertised essentially guarantees that *all* its pipes, regardless of condition, will be buried. The link footnoted below provides an example of one such holiday detector, which appears to be a battery-operated, handheld wand. The manufacturer of this model advertises *developer priorities* - "speed and avoidance of operator fatigue". The promotion fails to mention any prioritization of resident and community safety. [58]

One may infer from press inquiries and MVP public affairs officer responses, it does not appear that MVP *has ever rejected a pipe* upon trench side testing.[59] Maury Johnson of Monroe

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[55] https://roanoke.com/news/local/as-mvp-construction-extended-concerns-about-pipes-integrity-grow/article_0f82436c-2a2d-11ed-9a3b-336c79988438.html .
https://insideclimatenews.org/news/07102022/mountain-valley-pipeline-manchin-schumer/
Whistleblowers say 'bad seeds' undermine pipeline safety - E&E News (eenews.net)

[56] Company that inspects the Mountain Valley Pipeline has conflict of interest (roanoke.com)

[57] Inside Climate News, 10/11.22, *quoting* Attorney D.J. Gerken of the Southern Environmental Law Center, Asheville.

[58] https://spyinspect.com/

[59] Roanoke Times, 9/3/22, ("…That has yet to happen…"); .

County, West Virginia, has said *it's not a question of "whether MVP pipe will explode, but where, when and how many times it will explode."*[60]

Industry Standards in Testing, Repair and Recoating

Following the cancellation of the Constitution pipeline, an advertisement ran seeking purchasers of "mass inventory" of never used, "top quality" pipe. Experts expressed concern over photo and satellite data indicating Constitution pipes had been stored above ground without UV protection for over *twice* the NAPCA's standard of six months. Pipeline safety experts expressed concern whether that amount of exposure rendered the pipes unsafe for use in transmission of fracked gas.[61]

Keystone XL ("KXL") pipes which had been procured, manufactured and coated in 2009, 2010, and 2011, were still in stacks in storage yards in Canada and the U.S. in 2018.[62] The majority of pipe in outer layers of stockpiles had been whitewashed with an acrylic resin paint layer, at 1 ½ to 2 years after stockpiling, and again at 4-5 years, with the goal of limiting UV degradation. The inner pipes were not whitewashed, and the several feet at each end uncovered to avoid covering identification numbers.

Based upon concerns regarding pipe integrity, and particular standards developed by the Bureau of Land Management for the KXL, developer TC Energy undertook pipe testing in a temperature and climate controlled facility of a small sample of pipes stored in yards in Arkansas and exposed to sunlight for up to nine years.[63] The necessary qualities of pipe coating protection under analysis included *coating thickness, flexibility, absorption capacity and the ability to adhere to the underlying steel pipe.* These attributes prevent *corrosion* - a cause of up to one fifth of all pipe failures. Scientists concluded that the KXL pipes that had been exposed to UV light in a southern U.S. climate had "completely failed to retain their original properties and attributes", and therefor were "*unfit for purpose*" and required recoating.[64]

This testing process involved quarantining selected pipes at the pipe coating facilities, with the goal of minimizing the effects of injurious inclement weather on the analytical process. The Canadian and US tests were regulated at identical temperatures between 14 and 15 degrees Celsius. They were checked at consistent areas along the length and circumference of the pipe.[65]

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[60] Inside Climate News, 10/11/22.

[61] Inside Climate News, "Too Much Sun Degrades Coatings, That Keep Pipes From Corroding, Risking Leaks, Spills, and Explosions," by Phil Mc Kenna, October 11, 2020, p. 1.

[62] https://insideclimatenews.org/news/07102022/mountain-valley-pipeline-manchin-schumer/ https://insideclimatenews.org/news/07102022/mountain-valley-pipeline-manchin-schumer/

[63] https://insideclimatenews.org/news/07102022/mountain-valley-pipeline-manchin-schumer/

[64] *See* Technical Articles, Keith Coulson FICorr, James Ferguson, TC Energy Calgary, and David Milmine, DM Professional Services, Calgary, CA. Study of Stockpiled Fusion Bond Epoxy Coated Pipe, Journal of Corrosion Management, Jan/Feb 2020,, pp.16-21; and Canadian Study of the Influence of Ultraviolet Exposure on Stockpiled Fusion Bonded Epoxy Coated Pipe, Journal of Corrosion Management, Jan/Feb 2021, pp. 21-25, (hereafter "JCM '20, p.x, and JCM'21, p. *x*); Accufacts Observations on the Use of Keystone XL Pipeline Pipe Exhibiting External Coating Deterioration Issues From Long Term Exposure to The Elements, Letter, Richard Kuprewicz, Accufacts President, to Jaclyn H. Prange, Natural Resources Defense Council., October 1, 2020.

[65] JCM '21, p.23.

In the initial 2018 study of both whitewashed and non-whitewashed samples were assessed. Whitewash had been applied at 18-24 months after storage began, and again at 4-5 years. In all cases, the last few feet at the ends had been left without any whitewash, apparently to avoid covering over the pipe identification markings.

The results of that analysis relevant to MVP pipe are as follows:

> ***The pipe that was not whitewashed and was exposed to UV continuously during storage exhibited complete failures in dry adhesion evaluations.***
>
> ***The cathodic disbondment test results of the non-whitewashed pipe ends exposed to UV were deemed "total failures".***
>
> ***The flexibility tests were "all deemed failures" on the UV-exposed pipe ends and whitewashed piping.***
>
> ***All non-whitewashed pipe that was exposed to continuous UV at the storage site, such as pipe ends and stenciled areas, were deemed "no longer fit for purpose."***

Coulson and Ferguson undertook a second study, reporting a year later in Corrosion Management.[66] The second assessment identified that Canadian stockpiled pipe, whitewashed, snow covered and piled on the underside of the stack, retained all its original properties. The analysts attributed major differences observed in pipe coatings in southern climes to several scientifically known phenomena, including:

> ~Alternate absorption of moisture in damp weather and release in dry weather may have serious effects on coating properties. Where the Canadian snow cover, acting as "nature's sunscreen", reduced the impact of these moisture uptake and release cycles, **the "elevated temperatures in the southern United States would, in the converse, accelerate the cycles, leading to far earlier breakdown of the underlying FBE coating than was noted in Canada."**
>
> ~According to a Study by the National Institute of Water and Atmospheric Research ("NIWA") in New Zealand, **the levels of UV intensity in Canada are far less than those recorded in the Southern U.S., hence leading to a quicker breakdown of exposed UV coating in the southern U.S. than in Canada.[67]**

Coulson and Ferguson thus concluded: "Hence, reduced levels of moisture absorption, a sunscreen of snow, and less intense UV rays in Canada are the factors that most probably

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[66] *Id.,* 21-25.

[67] *JCM '21, p.25, citing*, J. Ben Lilley and Richard L. Mc Kenzie, "Where on Earth has the highest UV?", (NIWA), Lauder, Central Otego, New Zealand, 2006.

contributed to the comparatively lower level of injurious weathering effects suffered by Canadian pipe during storage."[68]

Comparative Information on Storage of MVP Pipes

While some MVP pipes may still be in stacks in storage yards (for example those in Lindside, West Virginia), thousands are still above ground on sites across the MVP ROW. Based upon MVP sworn statements, together with site observations, some 303 miles of MVP pipe were exposed to UV light for between one (1) to seven (7) years. Thousands of MVP pipes with years of exposure above ground are now buried.[69]

MVP pipes, coated in 2016 and 2017, procured by MVP in 2017, and moved from storage yards to sites from early 2018 through summer 2021, likely have up to seven years exposure to UV light - **in the same range of least one third of the KXL pipe found unfit for use.** While MVP has similar exposures to KXL, there is **likely far more UV damage to MVP pipes,** considering the scientific observations and findings regarding latitudinal climate differences in the KXL studies. In the southern United States, there are longer hours of UV light in the southern exposure; the UV light is more intense; and, the Appalachian heat, humid climate and precipitation play a documented role in impacting thickness, moisture, absorption and release, flexibility, embrittlement, cracking, and adhesion/ disbondment. All these factors easily support findings of pipe **"unfit for use."**

MVP pipes have been "stored" on the ROW - laying on rotting wooden cribs or on no cribs at all, on ground, at streams and wetlands, and perched on mountain crests above these waters, some strung, some not, since 2018.[70] It is unclear whether the company's motivation in moving pipe to the ROW out of construction order, was to reduce storage rental fees and shuffling expenses, or to pressure authorities to allow construction to proceed, or based upon sheer indifference. Credible documentary evidence in photos and video, as well as MVP's own compliance reports show that MVP's old coated *2016-17 pipes have been stacked in storage yards or on site above ground with no whitewash or other known additional protective coatings for up to seven years, which may be up to thirteen (13) times the industry limits.* Coatings expert Stuart Croll, has opined that the coating, likely "widely porous" from years of UV exposure, no

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[68] Id.

[69] *See William Limpert,* Comments in Opposition to Certificate Extension, FERC, CP16-10*, Accession No.* 20220729-5515, -5516*; and Limpert*: Mountain Valley Pipeline reassurances downplay catastrophic safety risk*, Roanoke Times, October 12, 2022.* https://roanoke.com/opinion/columnists/limpert-mountain-valley-pipeline-reassurances-downplay-catastrophic-safety-risk/article_20d65e28-2faf-11ed-ab36-4787ffb3558f.html Upon information, many of these buried pipes were left **without cathodic protection** for approximately two years. Experts commonly understand that **cathodic protection ("CP") is merely a second line of defense against corrosion** - it cannot be substituted for high standards of the first line of defense -coating application. CP varies with soil type, and its efficacy undulates, depending on the training of the operator. Pipeline Safety expert Kuprewicz notes that CP systems and ILI technologies lull some operators into overreliance - and that developers place unwise reliance on CP, thus failing to reliably evaluate and detect many forms of selective corrosion attack such as pitting, and some forms of crackling and corrosion. Kuprewicz, Letter to Prange, NRDC, October 1, 2020, p. 5.

[70] *See* Indian Creek Watershed Association, Comment on MVP pipes shifting and deteriorating on the ROW, citing ICWA 2018 filing re: MVP aggressively moving pipe onto the ROW, FERC Accession No. 20220217-5099. eLibrary | File List (ferc.gov) .

longer gives corrosion protection consistently along the extensive reaches of MVP pipe.[71] Indeed, "[MVP pipe is] probably in terrible shape," reflected Richard Kuprewicz," in discussing the absence of pertinent regulatory specifications on gauging coating condition prior to pipe burial.[72]

Inspection and Testing of Old-Coated Pipe

The systemwide testing and recoating of KXL pipes required transport to a controlled atmosphere to allow consistency in temperature and humidity, as well as avoidance of dispersing environmental toxins throughout human and other biological communities.[73]

At the Saskatchewan Oil and Gas Supply Chain Forum in Regina, Canada on October 4, 2018, TransCanada's Pipeline Manager-Canada for the Keystone XL Project Doug Brunning explained the process for inspecting and testing pipes exposed to the *to the elements for between 7 and 9 years in storage yards in sites in Canada and in Little Rock, Arkansas.* "**We're inspecting every piece of pipe**," Brunning stated. "**We have a whole test plan, 11 steps. We look at coating, we look at interior, we look for corrosion, we look at everything - cleanliness, all that other stuff. It either passes or it fails. If it fails, then its scrap…" Brunning explained that the testing and inspection process must be complete before stripping and recoating pipe is undertaken.[74]**

Brunning emphasized that recoating of degraded corrosion-proof coating is not something that can be done on construction sites. **"This would be in a plant environment," he said, indicating the pipe would have to be transported back to a plant, stripped, recoated, and sent back to the line again before usage.** This is not a process that can be done easily, quickly or without great expense.[75]

Conclusion: Cost-Benefit, Collateral Damage and Environmental Justice

Pipe coating, corrosion, and impacts to cathodic protection - all affecting pipe strength and stability – have not been considered by the Forest Service in tandem with concerns regarding multiple geohazards including steeps slopes, landslide prone soils and seismic zones. Time exposed in the elements, throughout periods during which MVP failures and offenses delayed construction, have created increased risks recognized by experts, risks which require evaluation of testing and assessment for large scale recoating and/or replacement, as well as the range of environmental impacts of any mitigation and/or remediation strategies.

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[71] Professor Emeritus (Retired), Department of Coatings and Polymeric Materials at North Dakota State University.

[72] "As MVP construction extended, concerns about pipe integrity grow," 9/3/22, by Laurence Hammack. https://roanoke.com/news/local/as-mvp-construction-extended-concerns-about-pipes-integrity-grow/article_0f82436c-2a2d-11ed-9a3b-336c79988438.html

[73] JCM Technical Articles '21,'22, *supra.*

[74] In its July 2021 Reply to Preserve Bent Mountain concerns regarding old-coated pipe and corrosion dangers accentuated by steep slopes, MVP has provided some manufacturer information, including product examples and a photograph of such a stripping and recoating process. *See* Manufacturer 3M's advertisement for recoating products. The process involves stripping the full original coating off to bare steel, then reapplying the coating as new. *See* FERC Accession No. 20210721-5100 (Attachment XX, p. 3). eLibrary | File List (ferc.gov) .

[75] TransCanada is inspecting its pipe in anticipation of Keystone XL beginning second half 2019 - SaskToday.ca

MVP has forced this project squarely upon environmental justice communities of the Virginias, including the rural elderly, the disabled, people of color, and people of low and limited income.[76] In three miles of construction corridor on Bent Mountain, for example, there live at least ten (10) such families, either directly or indirectly impacted, whether by the ROW or downstream of the ROW. Their land, water source, ingress/egress, their source of food, income, or other aspect of their daily lives are negatively affected. This does not account for the creation and/or exacerbation of stress related illness generated by the presence of uninvited workers and infrastructure.

Should MVP secure any permitting allowing it to advance construction, communities in its path will continue to suffer health related, environmental and financial losses. Should the pipe suffer a rupture from degradation and corrosion over the course of years on the ROW, the result to the public and the environment would be severe, irreversible and incompensible, with a high potential for human loss. Please see video linked in footnote below.[77]

Construction of the Mountain Valley Pipeline (MVP) presents unquestionable safety issues that may be neither minimized nor denied by regulators. Regardless of one's department, title, or job description, each has unanimously joined in an unequivocal pledge of safety. PHMSA has recently signaled a heightened concern with pipeline explosions, warning that *"inadequately reviewed or documented design, construction, maintenance, or operational changes can contribute to pipeline failure."*[78]

Executive Director Bill Caram of the Pipeline Safety Trust, noting MVP's compound risks—its jumbo diameter, increased pressure, geohazards and degraded coating, has stated unequivocally:

> "The Mountain Valley Pipeline is an especially large diameter, high pressure natural gas whose failure could lead to devastating loss. We need to take that very seriously. Building it through steep terrain susceptible to landslides with pipe that has been exposed to coating-damaging UV radiation for years past the manufacturer's recommendation is not taking this risk seriously enough. This is not a time to be building such a pipeline…"[79]

MVP's repeat decisions, on behalf of its shareholders, to force its project forward, in the face of proven mortal dangers of gas pipeline explosions, should be unacceptable to all regulators responsible for this project. We urge the Forest Service to reckon with these facts in protection of

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[76] *See* Preserve Bent Mountain, Comments in Opposition to Certificate Extension, FERC Accession No. 20220729-5314; eLibrary| File List (ferc.gov) . Protect Our Water Heritage Rights, Comment re: Steep Slopes and Floodplain Construction – MVP Prior Failures, 20210716-5168, eLibrary | File List (ferc.gov) .

[77] Peters Mountain - Mystery Ridge & MVP , Video by Paula Manns, Monroe County, West Virginia.

[78] PHMSA, Repair Criteria, Integrity Management Improvements, Cathodic protection, etc, 24 Aug 2022, https://www.govinfo/content/pkg/FR-2022-08-24/pdf/2022-17031.pdf . *See, e.g.,* 49 CFR 192.461, to take effect in May 2023, governing inspections as the pipe is placed in ground. That PHMSA has added regulation addressing last minute inspections, but not the issue of extended failure of pipe coating and corrosion, should in no way deter the Corps from exercising its own due diligence in "disaster avoidance."

[79] Bill Caram, Pipeline Safety Trust Executive Director, "Statement on the Mountain Valley Pipeline and the Energy Independence and Security Act of 2022," 9/23/22, pstrust.org.

human health and safety - *before* advancing this construction debacle, and a foreseeable and deadly explosion of the MVP.

The Forest Service has failed to consider multiple geohazards including steeps slopes, landslide prone soils and seismic zones, and necessarily, the degradation of pipe which impacts considerations for pipe strength and stability in these areas of heightened concern. Pipe coating, corrosion, and impacts to cathodic protection should be considered as compounding an already multiplied set of hazards.

The DSEIS further fails to evaluate inspections, remediation and site/environmental impacts of such mitigation and remediation.

For the reasons set forth here, we respectfully ask the Forest Service to take No Action and to decline the adoption of any of the eleven (11) proposed changes and/or any exception in favor of MVP permitting.

Respectfully,

s/ Roberta M. Bondurant
Roberta M. Bondurant
Preserve Bent Mountain