



HAVASUPAI TRIBAL COUNCIL

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August 6, 2021

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Groundwater Protection
Arizona Department of Environmental Quality
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Phoenix, Arizona 85007

Submitted via email to pinyonplainapp@azdeq.gov

Re: The Havasupai Tribe Comments Regarding the Pinyon Plain Mine Individual Aquifer Protection Permit

Dear Mrs. Gutierrez,

As residents of the Grand Canyon since time immemorial, the Havasupai Tribe (the "Tribe") submits these comments on the proposed Individual Aquifer Protection Permit Number P-100333 (the "Permit") for the Pinyon Plain Mine. The Tribe appreciates the opportunity to provide these comments and requests that the Arizona Department of Environmental Quality ("DEQ") give the utmost attention to these comments. Further, we incorporate by reference the comments submitted by the Grand Canyon Trust, the Sierra Club's Grand Canyon Chapter, the Center for Biological Diversity, Wild Arizona, and National Parks Conservation Association (the "Environmental Groups"), dated August 6, 2021.

We have been on the forefront of opposition to uranium mining within our aboriginal lands for generations. The associated health risks are known and documented, and these negative impacts have disproportionately affected indigenous populations in northern Arizona; you cannot ignore them. But more than other uranium mines that we have or will oppose, the Pinyon Plain Mine (formally called Canyon Mine and hereinafter referred to collectively as the "Mine") poses acutely elevated dangers to our People, as the Mine site rests directly above the Redwall-Muav Aquifer (the "R-Aquifer"). This is significant for several reasons. The R-Aquifer is the regional aquifer of the Coconino Plateau (the "Plateau") and serves as the sole source of water for people across arid northern Arizona. Snowmelt and runoff on the San Francisco Peaks and monsoon events percolates into the soils and vadose zones, filling the R-Aquifer. This water moves

underground, past the Mine site, as it makes its way to seeps and springs on the National Forests, on the South Rim of the Grand Canyon, and most importantly to Supai Village, our home at the bottom of the Grand Canyon. This process has occurred for millennia, and our elders understood this water process and how it worked long before scientists confirmed what we already knew. We know and understand our aboriginal lands.

These springs that omit from the rock walls and from the ground are sacred, and we have served as the keepers of these springs since time immemorial. Over 95% of R-Aquifer spring discharge emerges from Havasu Springs and downstream springs of Havasu Creek.¹ The blue-green color of Havasu Creek is from where our name is derived. We are the *Havasuwá* 'Baaja, the People of the blue-green water. Our identity as a people is intrinsically intertwined with the health of Havasu Creek and the environment it gives life to. We use this water for drinking, gardening and irrigating, municipal uses, and cultural and religious uses. The R-Aquifer, and to a lesser degree the Coconino Aquifer (the "C-Aquifer"), serve as the sole source of water for all uses in our home in Supai Village. If the water source becomes contaminated like we have seen in other areas of Arizona due to uranium mining, we will no longer be able to live in our homes and Supai Village will become extinct. It is for these reasons that we adamantly oppose mining operations at the Mine.

Issuing the Permit as currently proposed would be contrary to law, not supported by substantial evidence, and an arbitrary and capricious abuse of discretion.² Much of Energy Fuels Resources (USA) Inc.'s ("EFRI") foundational assumptions relating to hydrogeological conditions at the Mine site are unsettled or disputed, and possible scenarios that may lead to aquifer contamination are not considered. The Permit's failure to identify alert levels, establish current baselines for the R-Aquifer and the C-Aquifer, or even identify all the points of compliance, steals from us and the public the opportunity to provide meaningful comment.

In comments we previously submitted on August 30, 2019, we asked that DEQ deny the General Aquifer Protection Permit Renewal for, what was then, Canyon Mine. Beyond the known health risks associated with uranium, we noted that the Mine in 2019 was not the same project that was approved for a General Permit in 2014 due to the substantial changes in the volume, characteristics, and means of disposal of discharges. This was because of the millions of gallons of water that began pouring into the mine shaft in 2016 after drilling intersected what is believed to be a perched aquifer. This flooding continues today. Now, the mine shaft must be routinely dewatered and held on-site. This water consistently exceeds water quality standards for dissolved uranium toxicity levels. Sadly, DEQ was fully aware this was possible before issuing the permit

¹ Donald J. Bills et al, Hydrogeology of the Coconino Plateau and Adjacent Areas, Coconino and Yavapai Counties, Arizona, Scientific Investigations Report 2005-5222 Version 1.1, U.S. Geological Survey (2007).

² A.R.S. § 12-910(E).

but nonetheless chose to issue a General Permit.³ In our 2019 comments, we asked that rather than approve the General Permit, DEQ issue an Individual Permit for the limited purpose of closing down the Mine and facilitating post-closure activities. Such a course of action would not be novel, as DEQ has denied permits for mining operations at the Pinyon Plain Mine in the past.⁴

The irreparable harm caused by the Mine must be halted. We again ask that DEQ deny EFRI's application for a permit for mining operations and issue an Individual Aquifer Protection Permit for the sole purpose of immediately closing down Pinyon Plain Mine and facilitating post-closure monitoring, maintenance, and remediation.

I. EFRI FAILS TO COMPLY WITH THE STATUTORY STANDARD OUTLINED IN A.R.S. § 49-243(B)(2).

A.R.S. § 49-243(B) requires the Director of DEQ to issue a permit if the applicant (i) demonstrates that the facility to be permitted uses the best available demonstrated technology (B1),⁵ and (ii) that the applicant further establish either: (a) "that pollutants discharged will in no event cause or contribute to a violation of aquifer water quality standards at the applicable point of compliance for the facility(B2),"⁶ or (b) that the facility will not further degrade an aquifer that already violates aquifer quality standards (B3).⁷ The Mine fails to meet elements B(2) or B(3). Consequently, DEQ is not compelled as a matter of law to issue the Permit to EFRI, and such issuance would be discretionary.

To begin with, EFRI evidently fails to understand the standard announced in A.R.S. § 49-243(B)(2). EFRI claims that "in the unlikely event of a release, the facility would not violate [Aquifer Water Quality Standards ("AWQS")] at the [Point of Compliance ("POC")] . . ."⁸ The statute is clear that the standard is "**in no event**," not EFRI's conjured standard of "in the unlikely event." EFRI's misunderstanding is further evidenced by its belief that a release from the Mine is permissible under the standard so long as it is not the sole cause of an AWQS violation. The statute is more stringent and requires that such a release not "**contribute**" to a violation. Furthermore, the word "contribute" is not tempered or modified by surrounding language; a release that contributes by the smallest degree to an AWQS fails to meet the standard. Even more alarming is that DEQ also misstates this standard in the Permit.⁹ It is difficult to meet a standard

³ Gary Ullinskey, Memorandum to Arizona Department of Health Services, Oct. 29, (1986), stating that usable water had been found in the area at depths less than 150 feet and that more than half of the 18 exploration bores provided by Energy Fuels has encountered saturated zones, indicating the presence of perched aquifers near the mine site.

⁴ Individual Permit denied in 2002; General Permit denied in 2008.

⁵ A.R.S. § 49-243(B)(1).

⁶ A.R.S. § 49-243(B)(2).

⁷ A.R.S. § 49-243(B)(3).

⁸ EFRI App Application pg. 38.

⁹ Pinyon Plain Mine Draft Aquifer Protection Permit § 6.4.

one does not understand, and for the following reasons, EFRI's application fails to meet A.R.S. § 49-243(B)(2).

A. Science Surrounding Aquifer Recharge and Groundwater Flow Direction on the Plateau is Unsettled and Prevents DEQ From Making the Legal Finding That There is "No Event" Where Pollutants Discharged Would Not Contribute to an AWQS Violation.

A large body of scientific data has developed relating to groundwater on the Plateau, with a large portion of work being done in the past ten years, including several USGS topical studies published after 2010. However, EFRI and its consultant Hydro Geo Chem, Inc. mostly reference outdated data from 1986 through 1990 and the application relies heavily upon testimony provided by Errol L. Montgomery in 1990.¹⁰ Even when relying on Montgomery, EFRI is selective in data it highlights, as Montgomery also contradicts basic assertions made by EFRI. The hydrogeologic assumptions relating to groundwater flow and aquifer hydrological connections on the Coconino Plateau have also changed since Montgomery gave his testimony over thirty years ago. But regardless of publish date, the studies relating to hydrogeology are not extensive or comprehensive enough for EFRI to claim, or for DEQ to determine, unequivocally that "in no event" will discharged pollutants contribute to an AWQS violation.

The most recent study that EFRI relies upon to support its assertion that mining activity at the Mine could not pose a threat to water resources comes from Solder et al. (2020).¹¹ In that study, water sampled from both the R-Aquifer and C-Aquifer observation wells near the Mine were greater than 10,000 years old. EFRI uses this data to conclude that "the source of the groundwater must be distant from the site, and not the result of local recharge."¹² However, this directly contradicts Montgomery, who indicated in 1985 that the project vicinity was a groundwater recharge area and that generally the flow of groundwater was downward while some strata impeded the downward flow.¹³

EFRI also asserts that the integrity of the R-Aquifer is guarded by the hydrogeologic assumption that the R-Aquifer is "likely to be separated from the bottom of the Mine shaft by approximately 1,400 feet of low permeability rock."¹⁴ EFRI relies on studies from 2010 and 2016

¹⁰ "The findings/conclusions detailed in this Hydrogeologic Report are based on 1) testimony presented in 1990 by Dr. Errol Montgomery, Ph.D., . . . 2) a hydrogeologic report prepared by Errol L. Montgomery and Associates . . . and (3) site-specific and regional data collected since 1993." (Pinyon Plain Mine Hydrogeologic report at E-xviii).

¹¹ John E. Solder, et al. Rethinking groundwater flow on the South Rim of the Grand Canyon, USA: characterizing recharge sources and flow paths with environmental tracers. Hydrogeology Journal, Vol. 28, ppg. 1593-1613, 1604 (June 30, 2020) (emphasis added).

¹² Pinyon Plain Mine Hydrogeologic report at E-xv.

¹³ Errol L. Montgomery & Associates, Inc. July 17, 1985. Groundwater Conditions Canyon Mine Region Coconino County, Arizona, Prepared for U.S. Forest Service Kaibab National Forest Williams, Arizona.

¹⁴ Pinyon Plain Mine Hydrogeologic report at E-xviii.

to support this claim.¹⁵ What EFRI fails to mention is that Solder found that the similar ages of water at both the R-Aquifer and C-Aquifer at those observed locations “suggests a hydrological connection [of the two aquifers] *in the area of Canyon Mine*”¹⁶ and concluded that “contaminants . . . are likely to be transported into the deep aquifer, which is the primary source of South Rim springs and drinking water wells.” This “low permeability rock” frequently referenced by EFRI is far more permeable than EFRI represents. Indeed, Montgomery also found in 1985 that “[b]ecause confining layers are not completely impermeable, part of the perched water eventually leaks downward until it encounters fractures which permit the water to move downward and bypass the confining layer, or until the water discharges along canyon walls at seeps and springs . . .”¹⁷

EFRI claims repeatedly that the hydrogeologic conditions at the Mine site prevent contaminants from reaching the R-Aquifer. However, recent studies—some selectively relied upon by EFRI—suggest that the R-Aquifer and C-Aquifer are recharged locally near the Mine site, and there is likely hydrological communication between the two aquifers that permits migration of contaminants from the C-Aquifer to the deeper R-Aquifer, which is the primary source of water for the seeps and springs on the South Rim and on our Reservation. Montgomery also suggests that the contaminants can bypass the R-Aquifer and flow directly from the perched aquifers near the Mine to the seeps and springs that we reference throughout these comments. At the very least, this calls into question several of EFRI’s primary defenses of why mining activity at the Mine could not pollute the R-Aquifer and provides several events where pollutants could contribute to a violation. DEQ cannot make the legal finding that in no event will discharged pollutants cause or contribute to a violation of aquifer water quality standard for these reasons alone, and issuance would be discretionary.

B. Future Groundwater Use Within the Tusayan Area Could Result in a Reduction of the Hydraulic Head of the R-Aquifer Below the Hydraulic Heads in the C-Aquifer Allowing Contaminants in the C-Aquifer to Migrate to the R-Aquifer.

In addition to the intervening “low permeability rock” called into question above, EFRI further asserts that the hydraulic head of the R-Aquifer is higher than that of the C-Aquifer and implies that “the potential for any vertical flow from the aquifer is upward.”¹⁸ Because of this, EFRI claims that seepage of contaminants from the C-Aquifer would not reach the R-Aquifer, due to the greater upward pressure of the R-Aquifer.¹⁹ After speaking with our water consultants at

¹⁵ Bills et al (2016); Alpine (2010); and Pool (2016).

¹⁶ Solder at 1604.

¹⁷ Errol L. Montgomery & Associates, Inc. July 17, 1985. Groundwater Conditions Canyon Mine Region Coconino County, Arizona, Prepared for U.S. Forest Service Kaibab National Forest Williams, Arizona.

¹⁸ *Id.* at xix.

¹⁹ *Id.*

Natural Resources Consulting Engineers, Inc., we are concerned that, even if EFRI's assertion is technically accurate at this moment and that current hydraulic pressures may prevent downward seepage of groundwater from the C-Aquifer to the R-Aquifer, future groundwater use within the Tusayan area could result in reduction of hydraulic head of the R-Aquifer below the pressures of the hydraulic heads in the C-Aquifer, allowing downward migration of contaminants to the very aquifer that supplies water to Supai Village. Increased groundwater withdrawals from the R-Aquifer associated with any future nearby development will reduce the hydraulic head of the R-Aquifer. This is not an unlikely scenario as there are constant proposals to develop areas around Tusayan and other locations throughout our aboriginal lands. For example, the current Stilo Project proposes to build both residential and commercial developments in the areas to the east and northwest of Tusayan, respectively.²⁰ We are also concerned of the potential that groundwater pumping occurring around Tusayan could shift the groundwater divide south of the Mine at some point in time, reversing the direction of groundwater flow within the R-Aquifer underneath the Mine toward springs on the South Rim of the Grand Canyon.

While DEQ mandates safeguards at the Mine, nothing that EFRI can do will affect or prevent future increases in groundwater withdrawals from the R-Aquifer. Regardless, measures intended to mitigate the associated hydraulic effects on the breccia pipe (discussed below) and groundwater flow paths are absent from the Permit. Unfortunately, this scenario would likely occur during the post-closure phase of the Mine as withdrawals increase, and after EFRI has washed its hands of the Mine and the associated consequences. EFRI places emphasis on the respective hydraulic head of the two aquifers as being a naturally-occurring barrier to prevent pollutant migration between the aquifers, but this scenario demonstrates that it may not always be the case and represents an unconsidered event where pollutants discharged will cause or contribute to a violation.

C. EFRI Dangerously Mischaracterizes Groundwater Flow in the R-Aquifer and Ignores the Inevitable Subsidence of Breccia Pipes Due to Mining Activity.

Much of EFRI's characterization of the geological and hydrogeological conceptualization of the Mine site characterizes a singular-flow system, wherein groundwater flow occurs only within porous geological formations.²¹ This is a mischaracterization. The R-Aquifer is a "dual flow" system, with part of the flow system being rapid flow with short residence times (days to 10s years), and part of the flow being very slow with long residence times (100s to 1000s years).²² In the fast flow system, recharge from rainfall or snowmelt on the land surface may move through over 2000 vertical feet of rock, through thousands of feet of horizontal flow in the aquifer, to

²⁰ Proposal for Special Use Authorization by the Stilo Development Group USA, LP and the Town of Tusayan, fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd814358.pdf.

²¹ EFRI's application frequently discusses "confining rock" and "low permeability." See EFRI APP Application, 4.4.2 Natural Protections, ppg 37-39.

²² See Natural Resources Consulting Engineers, Inc. Memorandum enclosed with these comments.

finally discharge at a spring within a few days to weeks. The springs continued flow throughout the rest of the year after the rainfall or snowmelt ends is from the surrounding unfractured rocks that more slowly drain the water. Solder concludes that the R-Aquifer is likely recharged by “downward migration of groundwater from overlying aquifers along fractures, faults, and collapse features.”²³ The faults, fractures, and sinkholes that contribute to the rapid flow can be pervasive and any enhancement of them, such as mining activity, can lead to enhanced recharge to the R-Aquifer, or increased communication between the R-Aquifer and the overlying C-Aquifer. Breccia pipes can function as a conduit in such a dual flow system.

Breccia pipes by their nature are collapse features, caused by erosion and dissolution of minerals in underlying formations.²⁴ Radial faults and fractures extending down to the Redwall Limestone are certainly present around the breccia pipe target at the Mine and “ring fractures surrounding the breccia pipes tend to erode readily.”²⁵ While the mineralized portions of the breccia pipe may be relatively impermeable now, there are likely sections of the breccia pipe with less mineralization and cementation of fractures. These fractures could contribute to potential communication between the C-Aquifer and R-Aquifer, even if the overall travel time of contaminants takes hundreds of years. In the scenario mentioned above, future and increased groundwater withdrawals on the R-Aquifer may cause the hydraulic head of the aquifer to drop below the hydraulic heads in the C-Aquifer. Such a reversal of pressure can reactivate fractures associated with the breccia pipe at the Mine. This would provide a massive conduit between the C-Aquifer and R-Aquifer at the Mine site.

Despite this, the breccia pipe at the Mine is not a discharging facility in the Permit. Mining activities are likely to reactivate current fractures and lead to the inevitable future subsidence of the breccia pipe. “[U]nderground mine subsidence is an inevitable consequence of underground mining,”²⁶ such as the mining activity proposed at the Mine. This all would increase the permeability of the breccia pipe—even above the targeted mining areas—and allow for the infiltration of groundwater. This can occur from mining activity, or as described above, from changes in groundwater flow resulting from increased groundwater withdrawals on the R-Aquifer. This is likely to occur post-closure of the Mine and any post-closure plan must account for and mitigate against this scenario, yet this is neither considered nor discussed in the Permit. Regardless, no mitigation measure is likely to provide the low permeability of the host rock and areas that have

²³ Solder at 1596.

²⁴ Karen J. Wenrich et al, Breccia-Pipe and Geologic Map of the Northeastern Part of the Hualapai Indian Reservation and Vicinity, Arizona, U.S. Geological Survey, Miscellaneous Investigations Series (1996).

²⁵ Karen J. Wenrich et al, Solution-Collapse Breccia Pipe U Deposits Model 32e, Arizona Geological Survey (1992).

²⁶ Steve Blodgett and James Kuipers, *Underground Hard-Rock Mining: Subsidence and Hydrologic Environmental Impacts*, Center for Science in Public Participation (2002)

subsidied or backfilled exhibit greater permeability and “become preferential pathways for groundwater flow.”²⁷

D. The Plain Language of A.R.S. § 49-243(B) Makes Clear That EFRI Does Not Meet the Standard and Issuance Would Be Discretionary

It is entirely untenable for EFRI to suggest, or for DEQ to affirm, that pollutants discharged will in no event cause or contribute to a violation of aquifer water quality standards at the applicable point of compliance. DEQ simply does not have enough data to make this finding. Data is still outstanding to determine current water quality standards at the Mine site, and the science supporting EFRI’s assertions relating to hydrogeologic conditions underneath the Mine have been questioned—if not refuted—in the scientific community. The fact that more recent science is not wholly congruent with the data the EFRI directs DEQ toward, or that there are real possibilities that future activities related to the R-Aquifer can have a substantial impact on groundwater flow and hydrological connectivity of the C-Aquifer and R-Aquifer, is the precise reasons why EFRI falls well short of meeting the standard laid out in statute.

It could be argued that the plain statutory language in A.R.S. § 49-243(B) creates a near unreachable standard for a uranium mine operator. While true, this alone is not a permissible legal justification for approving a permit that does not comply with the statute. This standard applies to all facilities, other than water storage facilities, who apply for an individual aquifer protection permit. Other facilities have met this standard and have been issued individual aquifer protection permits, primarily because those facilities do not present the same dangers to an underground water aquifer that a uranium mine does. There may be locations in Arizona where uranium ore deposits do not rest above an aquifer that serves as the sole water source for thousands of Arizonans. Although the standards set forth may be high, the legislature clearly desired to protect water resources and if they wanted to make a different standard for uranium mine facilities, they would have done so.

If the statutory standards are not met, the Director is not compelled to issue a permit to EFRI. If DEQ moves forward and issues a permit to EFRI to commence mining operations at the Pinyon Plain Mine, it does so at its own discretion, and such an action would be arbitrary and capricious. DEQ will have chosen to permit a single mine operator, who has a history of submitting misleading information²⁸, at the risk of putting thousands of people in peril; it would represent yet another dark chapter in the brutal history of indigenous people of Arizona, who have disproportionately borne the consequences of uranium mining.

²⁷ Environmental Group’s August 7, 2021 Comments on Pinyon Plain Mine Individual Aquifer Protection Permit No. 100333, LTF 84446, pg. 17, citing enclosed Exhibit 2 at pg. 5.

²⁸ Former personnel of ADHS, ADEQ’s predecessor, noted “I have developed a mistrust of the accuracy of information supplied by [EFRI].” See Memo from Gary Ullinskey to Chuck Anders RE: Canyon Mine, Energy Fuels Nuclear. October 29, 1986.

II. IN THE ALTERNATIVE, THE APPLICATION CAN NOT MEET A.R.S. § 49-243(B)(3).

DEQ cannot make the legal finding that EFRI's application meets B(3) because DEQ currently does not know whether the R-Aquifer and C-Aquifer at the POC already violates AWQS, as much of this information is listed as "TBD" in the Permit. What is known is that the water from the R-Aquifer that omiss from springs in Supai Village exceeds the Environmental Protection Agency's (the "EPA") standard for arsenic in drinking water of 10 parts per billion. In 2014, we completed the construction of an arsenic treatment plant in Supai Village to bring our drinking water into compliance with the EPA standard. While this brought our water to within the EPA drinking standards, we must routinely replace the adsorption media in the treatment plant to keep arsenic at levels safe enough to drink. We do not want to see levels of arsenic continue to rise in the aquifers that omit to seeps and springs near Supai Village.

Even if DEQ were permitted to retroactively find that the R-Aquifer or C-Aquifer currently violates the AWQS for arsenic or another pollutant at the POC, EFRI has not demonstrated that mining operations will not further contribute to that exceedance based upon the reasons detailed in section I. Arsenic is an inherent byproduct of uranium mining. The "presence of sulfide minerals in uranium ore is a preexisting condition that promotes the release of radionuclides and toxic heavy metals from uranium mines into the environment."²⁹ Water pumped from the Mine contains uranium and arsenic in concentrations consistently exceeding federal and state AWQS. This is unlikely to change, and mining activity at the Mine will only exacerbate the issues of contaminated water.

III. THE PERMIT FAILS TO CONSIDER IMPACTS TO THE HAVASUPAI TRIBE.

DEQ goes to great lengths in the permit and on their website to emphasize that the Mine will not affect the springs on the South Rim of the Grand Canyon but fails to acknowledge or consider the impacts to our water in Supai Village. For example, DEQ "concludes that natural hydrogeologic protections at the mine site are expected to prevent any potential impacts to groundwater from mining operations."³⁰ DEQ further states:

The Southwesterly regional dip of the layered geologic section in the vicinity of the mine directs groundwater flow southwest away from the Grand Canyon coupled with the groundwater divide present between the mine site and the Grand Canyon. A groundwater divide acts as hydrogeologic control and provides an

²⁹ Committee on Uranium Mining in Virginia, Potential Environmental Effects of Uranium Mining, Processing, and Reclamation, pg. 181, (2012).

³⁰ Pinyon Plain Mine Draft Individual Aquifer Protection Permit, § 2.2.2.

element of natural protection by preventing northward migration of groundwater.³¹

The DEQ website further notes that “springs in the Grand Canyon located due north of the mine cannot receive groundwater from the area beneath the mine due to the geological and hydrogeological conditions in the regions.”³² To begin, the hydrogeologic feature cited above in no way protects groundwater from impacts from mining operations at the Mine; it is a statement regarding the direction of groundwater flow. Despite DEQ’s mischaracterization of this fact, it illustrates that groundwater is currently believed to flow away from the Grand Canyon. If the possibility of contamination of the groundwater is so small as to justify DEQ issuing the Permit, why is it significant that water does not flow north to the Grand Canyon? Surely, no one is concerned about clean groundwater flowing north to the Grand Canyon, yet DEQ feels compelled to repeatedly highlight this fact. As detailed above, scenarios of contaminants reaching the R-Aquifer are very possible, but regardless of the fact that those scenarios must prevent the issuance of the Permit, DEQ did not consider impacts to those locations where the groundwater does flow.

The same DEQ’s website referenced above describes that, “[i]mmediately beneath the Canyon Mine, the Redwall-Muav Aquifer flows to the south. Further downgradient it turns to the west and northwest.”³³ In other words, groundwater from the Mine site flows to Cataract Canyon and to Supai Village. It flows to our homes and to our sacred springs. It flows to feed the very Havasu Creek from where our People receive their name. DEQ knows this is where the water flows. Afterall, over 95% of spring discharge from the R-Aquifer emerges from Havasu Springs and downstream springs of Havasu Creek.³⁴ However, none of this is considered in the Permit. A simple word-search performed on the Permit results in zero results for the word “Havasupai,” and one result for the word “Supai”, which is only in reference to the Lower Supai Formation.

This Mine does more than threaten our only water supply. It has already affected the daily lives of the Havasupai people. The Mine rests within the Tribe’s Traditional Cultural Property designation of Red Butte. It is impossible to understate the significance that Red Butte has to the Havasupai people and other tribes in northern Arizona, who have names for Red Butte in their native languages. It is an origin point in the Havasupai creation story³⁵ and a traditional gathering place for the Havasupai to conduct ceremonies and gather medicinal plants. The meadow where the Mine site is located is sacred and spiritually tied to Red Butte.³⁶ However, our Tribal members

³¹ *Id.*

³² “Pinyon Plain Mine (Formally Canyon Mine) | Permit of Interest | FAQs: Page 5 of 7”, <http://www.azdeq.gov/PinyonPlainMine/FAQ?page=0%2C4>, last visited on August 2, 2021.

³³ *Id.*

³⁴ Donald J. Bills et al, Hydrogeology of the Coconino Plateau and Adjacent Areas, Coconino and Yavapai Counties, Arizona, Scientific Investigations Report 2005-5222 Version 1.1, U.S. Geological Survey (2007).

³⁵ Earl Paya, *Origin Tale. In Spirit Mountain: An Anthology of Yuman Story and Song*, pp. 155-161 (1984).

³⁶ U.S. Forest Service, Canyon Uranium Mine Review at 13-14.

have been forced to stop visiting this Traditional Cultural Property and have stopped harvesting plants, including the medicinal plants of cedar and sage, near the Mine site due to the evaporative spraying system on the non-stormwater impoundment pond. This system sprays water with elevated contaminants that was removed from the mine shaft. Tribal members have observed these contaminated mists being carried by the windy conditions on the Plateau well beyond the exterior fencing of the Mine site. Our concern is based on the fact that radionuclides, even at low levels of exposure, pose a risk to the health and safety of our Tribal members. Yet despite this, the evaporative spraying system is not recognized as a discharge facility. We have modified our cultural and historical practices around the Mine site and notified DEQ of such through our August 30, 2019 comments, yet these impacts are not considered by DEQ in the Permit.

These are egregious environmental justice violations, which “demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias”; and “mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustained planet for humans and other living things.”³⁷ But more importantly, this particular Permit violates the state of Arizona’s Environmental Declaration of Policy that demands that “air polluting activities of every type shall be regulated in a manner that insures the health, safety and general welfare of all the citizens of the state” (emphasis added).³⁸

IV. DEQ SHOULD REQUIRE ENFORCEMENT ACTIONS IN THE PERMIT ISSUED SOLELY FOR THE CLOSURE AND POST-CLOSURE PERIODS OF THE MINE

To comply with its core statutory duty to “protect the environment,”³⁹ the Tribe restates our requests from our August 30, 2019 comments and urges DEQ to ensure the following are incorporated into any Permit issued solely for closure and post-closure of the Mine:

- **Ample data gather** through generation of multiple rounds of ambient groundwater samples to ensure that AWQS exceedances will be monitored and minimized through an Aquifer Quality Limit proposal for each pollutant that exceeds an AWQS. Similar to the Environmental Groups, we ask that this includes “additional monitoring wells based on outstanding information on the geophysics and down hole tv logging to establish fracture tomography.”⁴⁰
- **Development of a contingency plan** to address future extraordinary high flow incidents in the Mine shaft if the discharge therefrom results in a violation of an AWQS or discharge limitation or an imminent and substantial endangerment to public health

³⁷ First National People of Color Environmental Leadership Summit, *The Principles of Environmental Justice*, (1991), <https://www.ejnet.org/ej/principles.pdf>, accessed July 15, 2021.

³⁸ A.R.S. § 49-401(A).

³⁹ A.R.S. § 49-104(A)(1) and A.R.S. §§ 49-241 to 49-252.

⁴⁰ See comments submitted by the Environmental Groups relating to this Individual Aquifer Protection Permit.

or environment. The occurrence of any of these conditions should trigger a requirement in the contingency plan to undertake verification sampling, provide notice to downstream or downgradient users, require more frequent and rigorous monitoring, trigger a DEQ inspection, require testing, assess the need for maintenance, provide for an evaluation of effectiveness, and trigger an upgrade of the discharge control features at the facility if necessary to address the grave threat increased discharges pose to drinking water in the region. Contingency procedures should also be developed to remediate water quantity and quality declines in groundwater, including the R-Aquifer and connected wells, springs, and streams.

- **Development of a new hydrogeologic study** to more accurately define the discharge impact area for closure and post-closure periods. The importance of a new hydrogeologic study cannot be overstated because of the need for sound information upon which DEQ and stakeholders can rely upon in protecting something so vital to public health and safety in a desert environment as drinking water. Additionally, given that mists from evaporative spraying system at the non-stormwater impoundment are carrying beyond the exterior fencing of the Mine site, there is also need for documentation of the extent and degree of any known soil contamination at and near the site, and an assessment of the potential for the discharge to cause leaching of pollutants such as arsenic and uranium from surface soils or vadose materials. Most importantly to the Tribe, there is also a need for an assessment of any changes in the groundwater quality expected because of discharges from the Mine, as well as a description of any expected changes in the elevation or flow direction of the groundwater expected to be caused by the facility. All of this information should have been contained within a new hydrogeologic study that EFRI should have produced as part of their Individual Permit application.
- **Updated and well-developed closure and post-closure plans.** These are greatly needed because of the changed hydrological condition of the Mine and the potential impacts that future groundwater withdrawals on the R-Aquifer in the Tusayan area. With the increased water volume accumulating in the Mine, and the interactive nature between the R-Aquifer and the C-Aquifer, the original closure strategy is no longer valid. An updated closure and post-closure plan must be informed by actual and more recently available data to ensure that it will be safe and not pose a public health and safety threat to the many communities in northern Arizona that rely upon these aquifers to supply their drinking water. We ask that terms and conditions be included in any closure or post-closure plan to prevent discharge into and pollution of the R-Aquifer from Mine workings; depletion of perched or other aquifers; and discharge from perched or other aquifers into Mine workings. We also ask that material exceeding

regulatory radiation limitations not be left at the Mine site or backfilled into the Mine shaft upon closure as these contaminants will pose a long-term threat to groundwater.

- **A public process** to ensure that public awareness and engagement be maximized with respect to the Mine's Individual Permit due to the level of threat that the contamination of the perched aquifer at the Mine poses to surrounding aquifers and the public who rely upon those aquifers.
- **A meaningful demonstration that EFRI has the financial capabilities to close and ensure proper post-closure care of the facility**, pursuant to the requests listed here, and in an amount far greater than the \$1,406,616.00 currently proposed.⁴¹ This demonstration should be through a performance surety bond held by DEQ, not EFRI. Such a bond must account for the possibility of managing groundwater contamination.

Cessation of operations at the Mine will require long-term monitoring to ensure no contamination of underlying aquifers, such as the R-Aquifer. In addition to the above elements that should be incorporated into the closure permit, we request that DEQ, with technical assistance from USGS, implement the following monitor and sampling requirements to address the specific dangers to our people that arose after mining operations pierced an underground aquifer: (i) multi-point downgradient water quality monitoring in the R-Aquifer; (ii) development of a long-term post-closure sampling program for at least 15 years; (iii) sampling in on-site water monitoring wells and springs at Havasu Springs, Indian Garden Springs, and Blue Springs; and (iv) that dye tracers be used to determine flow rates, pathways, and connectivity between perched and deep aquifers and connected seeps, springs, and streams. These costs should be borne by EFRI pursuant to Section VII(12) in the Record of Decision (the "ROD")⁴², where it is required that "[r]adiological surveys and appropriate cleanup measures" be taken "for all unplanned events, including . . . failure of the surface water control structures," such as the failure of the impoundments to contain the full amount of discharge from the Mine due to the perched aquifer piercing, and EFRI's desperate efforts to contain associated excess discharges. Pursuant to the ROD, "[a]ll [such] monitoring will be by independent contractors and all costs shall be borne by the applicant."⁴³

V. CONCLUSION

Now is the appropriate juncture for DEQ to ensure that activities at Pinyon Plain Mine do not further endanger public health or safety. This is accomplished by DEQ not issuing the Permit as currently proposed but rather issuing an Individual Aquifer Protection Permit for the sole

⁴¹ Other uranium mines, such as Mt. Taylor in New Mexico, estimate closure costs approaching \$10 million.

⁴² *Record of Decision Canyon Mine Proposal*, Kaibab National Forest, United States Department of Agriculture (1986), https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346658.pdf, last visited August 3, 2021.

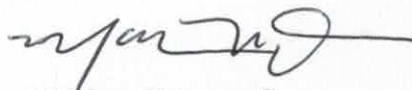
⁴³ *Id.*

purpose of closing down the Mine and facilitating post-closure monitoring, maintenance, and remediation. Issuance of such a permit is the only legally viable path forward available for DEQ to fulfill its legislative mandate to “protect the environment.”⁴⁴ The situation at the Mine has drastically changed since past litigation in 1990 and 2015. The hydrogeologic studies performed on groundwater since then, and the piercing of the perched aquifer, have provided DEQ with ample evidence to deny EFRI’s application for mining operations at the Mine. We ask why DEQ would jeopardize so much for the sake of a uranium mine that, in 30 years, has yet to produce any significant uranium ore? We request that you hear our voices and take the appropriate steps to safeguard our people and the vital aquifers of northern Arizona. We finally ask that DEQ continue to ensure significant and meaningful consultation with the Havasupai Tribe, not only relating to the Pinyon Plain Mine, but regarding all mining activities in northern Arizona.

As the protectors of the land, our Tribe and Elders have fought uranium mining for decades, gaining allies along the way who stand shoulder to shoulder with us as we work together, not just to protect our sole source of water, but our cultural identity as Havasupai People. The negative impacts of the Mine are widespread, yet no one will be impacted to the degree of the Havasupai if the Redwall-Muav Aquifer reaches toxic contamination levels. We are the People of the Blue-Green Water because our home has been at the bottom of the Grand Canyon along the blue-green waters of Havasu Creek since time immemorial. If the R-Aquifer becomes contaminated, and we must abandon our ancestral home of Supai Village, we will leave the blue-green waters of Havasu Creek behind and consequently will cease to be the *Havasuwaa ‘Baaaja*. While we may still breathe air, we, the People of the Blue Green Water, will have become extinct.

If you have any questions, please call me at (928) 552-3276.

Sincerely,



Matthew Putesoy, Sr.
Vice-Chairman
Havasupai Tribe

Cc: Havasupai Tribal Council
Denten Robinson, General Counsel

⁴⁴ A.R.S. § 49-104(A)(1).