Kimberly MacMillan

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From: **Donn Pillmore** <d.pillmore@energyfuels.com>
Date: Wed, Apr 27, 2011 at 12:45 PM
Subject: Comments on the Draft EIS for Northern Arizona Withdrawal REF: 2300 (AZ9100) AZA-035138
To: azasminerals@blm.gov
Cc: Frank Filas <f.filas@energyfuels.com>, Stephen Antony <s.antony@energyfuels.com>

Dear Mr. Scott Florence:

Attached please find comments, submitted by Energy Fuels Resources, pertaining to the Draft EIS for the Northern Arizona Proposed Withdrawal Ref: 2300 (AZ9100) AZA-035138.

Regards,

Donn Pillmore

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ENERGY FUELS RESOURCES CORPORATION

April 27, 2011

VIA Email azasminerals@blm.gov
Northern Arizona Proposed Withdrawal Project
ATTN: Scott Florence, District Manager
Bureau of Land management
Arizona Strip District Office
345 East Riverside Drive
St. George, UT 84790-6714

RE: Comments Pertaining to the Draft EIS for the Northern Arizona Proposed Withdrawal Ref: 2300 (AZ9100) AZA-035138

My family and I moved to and have lived in Kanab, Utah since 1982. I was relocated by Energy Fuels Nuclear, Inc. to take the position of Chief Operations Geologist. I was in charge of all of the mine geology of the operating mines as well as working with the exploration department to bring new deposits into development. The position of Chief Geologist from 1982 to 1992 gives me a unique insight into the geology and resources of the breccia pipe deposits located in the northern Arizona proposed withdrawal area.

After reviewing the DEIS, I strongly object to the proposed withdrawal of 1,010,776 acres under the Proposed Action (Alternative B), 652,986 acres under Alternative C, and 300,681 acres under Alternative D. **The only acceptable Proposed Action is Alternative A – No Action – Area Open under the Mining Law.**

Based on the assumptions used in the DEIS under Alternative A (No Action Alternative), new disturbance for 30 new mines and 728 new exploration sites (Section 4.2.5), which I view as very optimistic, only 1,364 acres of new surface disturbance for exploration and mine development is projected to occur, which represents about 0.1 percent of the 1,010,761 acres of land proposed for withdrawal under the Proposed Action. Most of the potential impacts associated with Alternative A have been quantified as minor to moderate, which based on my experience have assumed worst case scenarios; therefore, I see no valid reason to withdraw any additional lands from mineral entry and location in this region.

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In support of my position, I have provided general and specific comments below regarding the DEIS.

General Comments

1. In Section 1.3.1 of the DEIS, the Purpose of the Action is described as "to protect the natural, cultural, and social resources in the Grand Canyon watershed from the possible adverse effects of the reasonably foreseeable locatable mineral exploration and development that could occur in the segregated area." The Need for Action is described in Section 1.3.2 of the DEIS as "concerns that future hardrock mining activities in the Grand Canyon watershed, particularly for uranium, could result in adverse effects on resources." The first paragraph states that historic mines in the area date back to the 1860's and that impacts from these mines are primarily associated with older copper and uranium mines that were operated prior to the new regulations and permitting that mitigates potential issues. However, the DEIS analysis clearly shows that most of the projected impacts to resources are negligible or minor under the "No Action" alternative. Furthermore, the projections of moderate or major impacts are based on "worst-case" scenarios that do not adequately take into account the mitigation that would be required under the site-specific NEPA analysis for each project. Accordingly, it is my belief that there is no need for action and that no further withdrawals of public land are justified.

2. As described in Section 2.4.1 of the DEIS, 4,998 square miles of lands in the vicinity of the proposed withdrawal area have been previously withdrawn from mining activity under national park, national monuments, and game preserve designations. This does not include other large land blocks controlled by various tribes in the region that have also declared uranium mining moratoriums. Further, as discussed in Sections 4.3.5 and 4.3.6 of the DEIS, approximately 50% of the 9,100 square miles designated as high mineral potential for uranium in northern Arizona and southern Utah have been previously withdrawn from mineral location and entry. Under the Proposed Action, the land withdrawn would increase by 1,579 square miles to almost 70% of the land with high uranium potential. This proposed action is inconsistent with the Energy Policy Act of 2005 (Public Law 109-58), which emphasizes the reestablishment of nuclear power (Sections 601 through 657). Implementation of the proposed action would decrease our ability to meet the world demand for uranium which is projected to grow from approximately 189 million pounds in 2010 to 336 million pounds in 2020 (RBC Capital Markets, September 2010). The Proposed Action is also inconsistent with the following federal legislation.

- The Domestic Minerals Program Extension Act of 1953 - stipulates that each department and agency of the federal government charged with responsibilities concerning the discovery, development, production, and acquisition of strategic or critical minerals and metals shall undertake to decrease further, and to eliminate where possible, the dependency of the United States on overseas sources of supply of each such material.

- The Mining and Minerals Policy Act of 1970 - declares that it is the continuing policy of the federal government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources. This act includes all minerals, including sand and gravel, geothermal, coal, uranium, and oil and gas.

- The Federal Land Policy and Management Act of 1976 - reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner which recognizes the need for domestic sources of minerals and other resources.

- The National Materials and Minerals Policy, Research and Development Act of 1980 - requires the Secretary of the Interior to improve the quality of minerals data in federal land use decision-making.

- The Arizona Wilderness Act of 1984 – states that the designation of wilderness areas in Arizona is not to lead to the creation of protective perimeters or buffer zones around each wilderness area. The fact that non-wilderness activities or uses can be seen or heard from areas within a wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area.

Specific Comments

Executive Summary:

The executive summary appears to ignore the findings of the technical specialists and overstates the impacts of the proposed alternatives, especially Alternative A (No Action) for cultural resources, American Indian resources, aquatic and terrestrial habitats, and special status species when compared to the detailed analyses provided in Section 4 of the DEIS. Major direct impacts are not

identified for any of these resources in Section 4 and it appears that the Executive Summary does not accurately represent the findings of the technical specialists. It is recommended that this section be entirely rewritten to correct statements that do not properly reflect the detailed analysis and that additional general information be included, especially the types of mitigation that are required by federal and state agencies to minimize impacts, which are incorporated into an approved Plan of Operations and are specified in the Decision Record.

I also recommend that the topics under the "Affected Environment" and "Environmental Consequences" should be presented in the same order as in the main body of the DEIS. Changing the order serves no purpose and makes it more difficult to read the document. A summary table could also be added to the "Environmental Consequences" section and in a new 4.17 subsection of the report so that the reader can more easily understand the document's conclusions.

I disagree with the assessment that "major direct impacts" would occur to cultural resources if avoidance is not possible. This assessment is incorrect, the statement "if avoidance is not possible" is flawed because current federal laws would not allow destruction of cultural resources. In addition, there is no mention of "major direct impacts" in Section 4.11 of the DEIS, which provides details of the cultural resource analysis. Furthermore, as discussed in Sections 4.11.1 and 4.11.2 of the document, existing mining regulations address cultural resource disturbance through avoidance and mitigation.

I disagree that a "major long-term direct impact" would occur to American Indian resources under any of the proposed alternatives. Section 4.11 discusses risk to impacting American Indian resources in a qualitative manner and also discusses mitigation measures; however, the section does not predict major long-term impacts for any of the alternatives. Therefore, the executive summary needs to be corrected.

I disagree that a major long-term impact could occur to aquatic and terrestrial habitats under Alternative A. I could not find any mention of a "major long-term impact" in Sections 4.6 and 4.7, which provide the detailed analyses for vegetation and fish and wildlife.

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I disagree that a major long-term impact could occur to special status species under Alternative A. I could not find any mention of a "major long-term impact" in Section 4.8, which provides the detailed analyses for these species.

I disagree with all potential major impacts identified for water resources under any of the alternative. This is discussed under the 4.4.1 and 4.4.4 comments below.

Section 2.4.2:

The assumed scenario of 18 new mines coming into production over the next 20 years in addition to the three existing ones is extremely optimistic and probably represents the maximum number of mines that could possibly be found, permitted and put into production during that time frame if exploration was very successful. A more likely number would be 10 (one every two years). Based on my past experience during the 1980's and 1990's there was extensive exploration carried out by numerous companies. Energy Fuels Nuclear Inc had an aggressive exploration program as did Rocky Mountain Energy, Pathfinder Mines, Uranerz and others. During the ten year period from 1982 to 1992 only five new deposits were located (Hack Canyon and the Canyon pipes were discovered in the 1970's) and developed into mines and two of the five were readily visible from adjacent canyons. Therefore, the easy-to-find deposits in the area have already been found and it is unlikely that future exploration will be as successful as past exploration even with improved exploration techniques. Furthermore, the time to permit a new mine on public land in the U.S. now averages about 7 years starting with baseline studies and mine design, continuing through development of a plan of operations, and culminating with state permit applications and the NEPA analysis.

Section 4.1.1:

Under Bullet 2, of the 45 confirmed breccia pipes noted for potential future mining activity, many of these pipes have been thoroughly explored and don't have sufficient resources to justify mining operations now or in the future. In addition, several of the breccia pipes on the list that are classified as undetermined have sufficient exploration to remove them from the list since they are not breccia pipes. Therefore, based on my knowledge of most of the pipes on this list, this list should be reduced by at least 12, a reduction of over 26%.

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The 7-year mine life listed under Bullet 4 appears to be based on historic information. Currently, permitting and planning is typically much longer than two years for a new mine. There is insufficient milling capacity at the White Mesa Mill to process full production (assumed at 300 tons per day) from six mines on the Arizona Strip. Because of the relatively high grade of the ore, the precipitation and packaging portion of the mill can probably only handle 1,000 tpd over a 350 day work year and that would assume that all of the mill's ore was coming from the Strip and none from existing mine operations in Utah and Colorado. Assuming a maximum number of mines (i.e., 6) at a relatively high average production rate (i.e., 300 tpd) results in an over-calculation of impacts including the truck haulage numbers. While I do not object to making these assumptions, the text should state that the numbers represent a maximum potential impact.

Under Bullet 8, making the assumption that each mine would drill a production well into the R-aquifer is not a correct assumption. These wells are deep and expensive and several of the mines on the list that will be developed and mined are clustered (i.e. EZ 1, EZ2 and the What and Findlay Tank NW and SE) where only a single well would be drilled for the clustered pipes. It is also highly likely that breccia pipes near a facility with a deep well, if developed, would truck water from an existing well rather than take the risk and go to the expense of drilling and developing a new well. Also, the amount of water assumed to be used by each mine is exaggerated due to the fact that each breccia pipe has some perched water that is contained in the mine and can be used for mining operations.

Section 4.2.3, Page 4-10

Fugitive dust estimates for exploratory drilling is high based on the fact that most of the drill holes lose circulation within the first 100' of the hole and it is necessary to use water and foam to maintain the condition and competence of the hole during drilling operations, thereby eliminating any dust being generated from the drilling operation.

Section 4.2.4, Page 4-24:

In the last paragraph, it states that "It is possible that emissions from proposed mine operation activities could impact the Park. However, this is relative to the location of the actual proposed mine within the parcel and must be determined for each source location." While this may be theoretically true, the regulations do not allow for this to occur. It is recommended that language from page ES-13 of

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the executive summary be added here to clarify that "Current governing laws and regulations would require any future exploration and development activities to demonstrate that the proposed activity would not impact Class I areas ..."

Section 4.2.5 – Climate Impacts Page 4-27

The DEIS states that breccia pipe project's GHG emissions would increase the concentration of the GHG in the atmosphere by a very small amount in combination with present and future GHG emissions from other sources and could contribute incrementally to the previous mentioned impacts.

At the same time, the DEIS fails to calculate the GHG reductions that is represented by the uranium energy resource. A calculation can determine the GHG reduction from the energy content of the uranium and then by subtracting the amount generated would be the net benefit. For example, the amount of uranium in the withdrawal areas would produce enough fuel to equivalently run the Navajo Generating Station (NGS) for over 77 years. The NGS produces 20.1 million tons of CO2 per year. The total offset of CO2 by using uranium as a fuel is 1.56 billion tons of CO2. The production of CO2 by uranium exploration and mining in the withdrawal area was calculated at 399,100 tons, therefore; a net savings of nearly 1.56 billion tons of CO2 is generated by using uranium from the withdrawal area as nuclear fuel.

Section 4.3.1, Page 4-37:

The average U.S. citizen is not able to translate pounds or tons of uranium into a meaningful context. I suggest providing the power generation equivalent of the estimated production for each alternative in a readily understandable manner. For example, the number of Phoenix Metropolitan areas that could be powered by the uranium once it is converted into fuel rods. In addition, that data should also be compared to the equivalent amount of coal and oil needed to generate the same amount of power. This will help the average person understand the importance of exploring for and developing this resource.

Section 4.4.1,Springs:

The assumption on page 4-49 that perched water in and around breccia pipes has any connection with the water that feeds the springs is not based on actual data but on theory. Based on my experience working in the mines, due to the inward dipping beds that surround a breccia pipe in the immediate vicinity of the

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breccia pipe, a perched aquifer is typically limited in area to the circumference of the pipe. Water that is encountered during mine development is generally minor and tends to flow into the workings through nearly vertical, concentric fractures that surround the pipe. The structural affects of the breccia pipes creates an aquifer boundary as described in the Manual of Applied Field Hydrogeology by Weight and Sonderegger, 2001, that has not been adequately studied in the preparation of the DEIS. Hydrostratigraphy, structural changes, and adjacent earth materials all affect groundwater flow and the separation of saturated materials into individual aquifer units. I believe that the perched water around the pipe falls into an individual aquifer unit and is not connected to the aquifer units that feed the individual springs. The perched water that is found around breccia pipes is trapped between the concentric fractures and the edge of the pipe. The interior of the pipes are dry. The initial inflow into the mine through the mine drifts that intersect the concentric fractures is relatively high, but rapidly diminishes as there is very little recharge through the fractures to this perched water and there is very little storage capacity, other than in the fractures. In most of the mines the perched water dries up completely due to ventilation of the mine and very little recharge. In the Pigeon Mine, there was some recharge at the end of mine life that was measured at about 0.8 gpm, which could be accounted for due to the close proximity of the Pigeon breccia pipe to the edge of Snake Gulch. It has been my observation, that due to the removal of gypsum and dissolution (karsting) of the limestone that occurs in the Kaibab and the Toroweap Limestone Formations when they are exposed along the canyons, the formations tilt into the canyons forming large open fractures that parallel the edge of the canyons. These open fractures account for the majority of water that feeds the various springs and just like in the mines, the only perched water storage is in the vertical fractures and along formational bedding planes and not in a horizontal lithologic horizon, which means the assumed watershed areas projected in the DEIS for the springs is excessive, based on theory and not supported by actual data. The DEIS also suggests that water flow into the mine workings, following reclamation, could affect the water flow to the springs in the area. First of all, even if there were a total of 30 mines opened up the actual volume of open mine workings in relation to the 1.1 million acres to be withdrawn is negligible and would have little to no impact on the flow to the springs.

On page 4-60, the use of data from and around the Orphan Lode Mine is inconsistent with the deposit's geomorphology and the mine's history. The Orphan Mine was on a single, patented lode mining claim located in 1893 for copper. There were three drifts driven in mineralized outcrops near the north end line of the claim. In 1953, the USGS noted uranium in the old workings, which

means the waste rock from the original mining operations that was dumped over the edge of the Grand Canyon contained uranium. In addition, the Orphan breccia pipe is eroded down into the Hermit Formation along the northeast edge of the canyon and undoubtedly uranium was eroded and was washed down the side of the Grand Canyon and into nearby drainages from on-going erosion. Therefore, it is probable that surface water running through the mine waste into the fractures that are parallel to the canyon and into the R-aquifer resulted in the anomalous uranium values; accordingly, it is unlikely that the reported uranium contamination is from water inside of the mine. Based on the USGS report, The Orphan Lode Mine, Grand Canyon, Arizona, A Case History of a Mineralized Collapse-Breccia Pipe, by William L. Chenoweth, Open-File Report 86-510, personal discussions with Mr. Chenoweth and personal observations in the eight Energy Fuels Nuclear mines I worked in, it appears that erosion over the Orphan Pipe resulted in the dissolution and transportation of secondary uranium mineralization occurred in and around the Orphan Mine. In addition, the mine was never reclaimed or sealed in; it was still accessible during the 1980's (based on personal experience). Storm water and runoff were allowed to further erode and transport the mine waste rock containing uranium into nearby drainages and down the side of the Grand Canyon. From a scientific standpoint, any data derived from spring samples or drainage samples in the area of the Orphan Mine cannot be relied upon to be valid or representative, or used for any assumptions as to exploration and mining impacts that occurred during the 1980's or any present or future exploration or mining activities.

At the bottom of page 4-60 the assumptions regarding mine drainage reaching the R-aquifer appear to be unrealistic as stated above. For example, the second bullet assumes a very high uranium concentration of 400 µg/l reaching the R-aquifer, even though most breccia pipes are separated from the R-aquifer by many hundreds of feet of Hermit Shale and other confining layers. It needs to be emphasized that the Orphan Mine is a unique situation where the mine is actually located on the edge of the Grand Canyon and was operated during a time when minimal government regulations were implemented to mitigate potential contamination. The last bullet assumes that there is no attenuation or dilution occurring, although they would occur and can be added to the model. It is recommended that the model be revised to more closely reflect the characteristics of the breccia pipes that were mined during the 1980's under Plans of Operation approved by federal and state regulators and include the hydrogeology of the area and the natural processes that tend to reduce environmental impacts.

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On page 4-63 paragraph under "Wells" the following statement is made *"Although possible, these impacts are not considered likely because of the removal of contaminated sump water during mining, reclamation of the mines, monitoring, and the low permeability conditions that typically occur in the breccia pipe and in the hundreds of feet of intervening rock formation between the aquifer and the mine openings. Because data are insufficient to estimate the specific flow paths and dilution in the aquifer at future mines, it is not possible to quantitatively project the potential impacts to chemical quality at non-mine R-aquifer wells, if such impact were to occur. Therefore, it is assumed that the potential impact would range from none to major."*

Without knowledge that this can even occur, how can it be considered a potential major impact? Similarly, projected moderate to major impacts to surface water quantity and quality are equally flawed by the assumption that if a mine is close to a water source, that water source will inevitably be negatively impacted. Simply put, the regulations require baseline characterization of surface water and do not allow for these types of impacts to occur.

Section 4.4.4:

The method for determining degree of impact on perched aquifer springs is based on the probability of a mine occurring in the vicinity of a perched aquifer spring. Based on the number of mines assumed in the North Parcel, a moderate impact is projected in the second paragraph of page 4-68 for Alternative A. However, this methodology does not take into account the groundwater and surface water characterizations that are performed as part of state and federal permitting process and the mitigation measures that would be included in a plan of operations located in close vicinity to a spring. Furthermore, most springs that are connected with mineralized areas tend to have naturally poor water quality prior to the advent of any mining.

The method for determining impacts to wells located within a perched water system relies on similar assumptions (i.e., probability that such a well might be located near a mineralized breccia pipe). And, as discussed on page 4-71, the risk of impacting such a shallow well in the North Parcel was stated as 'no impact to major impact." As discussed above, permit conditions and mitigation measures are designed to limit and mitigate impacts; accordingly, projecting a moderate or major impact to existing wells is inconsistent with the regulatory requirements.

The assumption that up to half the mines might contribute 1 gpm of water containing elevated metal concentrations to the R aquifer (see pages 4-60 and 4-75) are not justified given the presence of thick aquicludes (hundreds of feet of Hermit Shale and other shale units) between the breccia pipe deposits and the aquifer. Accordingly, predictions of moderate impacts to the water quality of the R aquifer are not technically supportable.

Section 4.15.3:

The second paragraph on page 4-240 states that there would be no impact on employment at the White Mesa Mill if Alternative B is adopted. We believe that the statement by a Denison employee was probably taken out of context. The fact of the matter is that if the mill does not have an adequate amount of ore at a sufficiently high grade, it cannot run economically and it is shut down, resulting in large layoffs. The higher grade ore found on the Strip is an important asset during downturns in the uranium market, as it has allowed the White Mesa Mill to continue operating in the past when other mills had to shut down.

Section 4.16.2:

The first paragraph on page 4-250 does not take into account that the mill may need to shut down as described immediately above. The statement in the second full paragraph of page 4-253 that uranium is a fungible commodity and therefore its production in the U.S. would not assist us in obtaining energy independence is misleading. With so much of the worldwide production of uranium coming from countries that are antithetical to our interests, domestic uranium production will provide our country with a secure supply should uranium imports into the U.S. be restricted in the future.

Energy Fuels believes that the current moratorium on staking mineral claims within the proposed withdrawal area was done in response to exaggerations of the potential mining impacts based on the number of new claims being filed. In fact we have visited a number of websites that support the withdrawal because otherwise the mining companies would commence "strip mining next to the Grand Canyon." Nothing could be further from the truth, as underground breccia-pipe mines are few in number and impact only "postage-stamp-size" areas of 20 to 25 acres. Furthermore, the existing national park, national monuments, and game preserve have adequate buffer areas around key features and an additional withdrawal of lands from multiple use is unnecessary to protect these features.

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Conclusions:

Since the early 1980's uranium mining on the Arizona Strip was conducted in an environmentally friendly manner with no moderate or major direct impacts to the environment. The company who conducted the mining, Energy Fuels Nuclear, was presented awards from the BLM for reclamation work that was completed on several of the mines on the Strip. The performance of Energy Fuels Nuclear, Inc's mining operations and other mining companies operating on the Arizona Strip during the 1980's with only minor environmental impacts should be sufficient testimony that no withdrawal of land is necessary. The existing comprehensive permitting and monitoring requirements and financial assurance requirements in place today are more than adequate to protect the environment.

Any of the proposals other than the No Action Alternative would also result in a number of negative impacts including the loss of high paying jobs in the area, the loss of tax revenue to the state of Arizona and the removal of valuable and economic uranium reserves needed to fuel nuclear power plants in the United States and the world.

For the above stated reasons, Energy Fuels Resources strongly urge the Secretary of the Interior to choose the **"NO Action Alternative"** under the DEIS.

Thank you for the opportunity to comment on the DEIS, I would be happy to further discuss any of the above topics with the EIS team. My contact information is listed below.

Very truly yours,

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VP: Arizona Strip Operations

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