

Kimberly MacMillan

----- Forwarded message -----

From: **Larry D. Turner** <dirxploration@fastmail.us>

Date: Mon, Apr 25, 2011 at 12:05 PM

Subject: Draft EIS Comment

To: NAZproposedwithdrawal@azblm.org

Cc: Iltys <iltturner@mindspring.com>, Cyndy Cole <ccole@azdailysun.com>, James K Otton <jkotton@usgs.gov>, bvangose@usgs.gov, Lorraine Christian <Lorraine_Christian@blm.gov>, "Terry W. Fox" <twfox@bellsouth.net>, "Benedetto, Kathy" <Kathy.Benedetto@mail.house.gov>, Rody Cox <rody_cox@blm.gov>, Scott Florence <Scott_Florence@blm.gov>

Northern Arizona Proposed Withdrawal Project

ATTN: Mr. Scott Florence, District Manager

345 East Riverside Drive

St. George, Utah 84790-6714

Dear Mr. Florence:

Attached please find a letter supplying DIR's comments on the Draft EIS concerning, among other things, the possible adverse environmental effects of continued uranium exploration and mining in northern Arizona. Our comments are limited to the question of how much of the northern Arizona uranium resource hosted in breccia pipes would be made inaccessible by following through on the DOI's proposed mineral lands withdrawal. Our data clearly show that the Draft EIS and its supporting ancillary documentation inaccurately answer the question of how much of the northern Arizona uranium resource would be removed from development and subsequent human use as an energy resource by following through on the proposed withdrawal.

As said in our DEIS commentary letter, please do not hesitate to contact us if you have any questions about the information we here provide you.

Thanks for your attention.

Cordially,

Larry D. Turner

President/managing geologist

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April 23, 2011

Northern Arizona Proposed Withdrawal Project
ATTN: Mr. Scott Florence, District Manager
345 East Riverside Drive
St. George, Utah 84790-6714

Dear Mr. Florence:

As you may remember, DIR Exploration, Inc., is one of the mineral exploration companies conducting uranium exploration work in northern Arizona. DIR has been actively involved in this particular uranium-mineralized region of the US since 1981.

Our comments on the Draft EIS are here limited to further defining the mineral resource potential of the three separate parcels proposed for temporary (20-year) withdrawal from mineral entry by the US Department of Interior. The information provided you here reasonably supports withdrawal of the East Parcel only (the Houserock Valley parcel). Withdrawal of the East Parcel from mineral entry for a period of 20 years would, according to the new data and information provided you here, have little or no economic impact on the northern Arizona uranium mining industry. DIR does, however, believe that following through on the proposed withdrawal of the North and South Parcels will strongly damage the Arizona-based uranium mining industry. The geologically-based reasons for this overall judgment and recommendation are explained below.

The general and specific assessments of uranium resource potential provided at <http://www.blm.gov/az/st/en/prog/mining/timeout/maps.html> as *Segregation Mineral Potential Report* and as Chapter A, Uranium Resource Availability in Breccia Pipes in Northern Arizona, in *Hydrological, Geological, and Biological Site Characterization of Breccia Pipe Uranium Deposits in Northern Arizona*, do not take into account a geologically-obvious structural control of the distribution of economically-mineralized uranium-bearing breccia pipes in northern Arizona. *Resource estimates qualified by recognition of this clear control of the location of economic breccia pipe uranium mineralization show that the proposed withdrawal of about 1,000,000 acres of northern Arizona will not result in a small 12% decrease of the Arizona uranium resource availability, but will instead result in a much larger (6x) 76% decrease in availability of this particular domestic energy resource.*

It has been long recognized that the shape or morphology of basement rocks frequently exerts a strong control of the location of the overlying mineral deposits within a region, or, more locally, within a mining district. Epigenetically-related

examples especially relevant to the northern Arizona case include basin edge localization of high-grade uranium mineral deposits in the Athabasca Basin of Saskatchewan, and the control of the distribution of Mississippi Valley type lead-zinc deposits by the Ozark High/St. Francois Mts. in Missouri.

The regional three-dimensional morphology of the pre-uranium mineralization basement in northern Arizona is indicated by the Devonian system isopachous map of Lessentine¹ supplied here as Figure 1. As can be seen in Figure 2 taken from Beus,² the thinning of the Devonian (Temple Butte) sedimentary rocks denoted by the isopachs of Figure 1 is directly related to the shape of the older basement rocks.

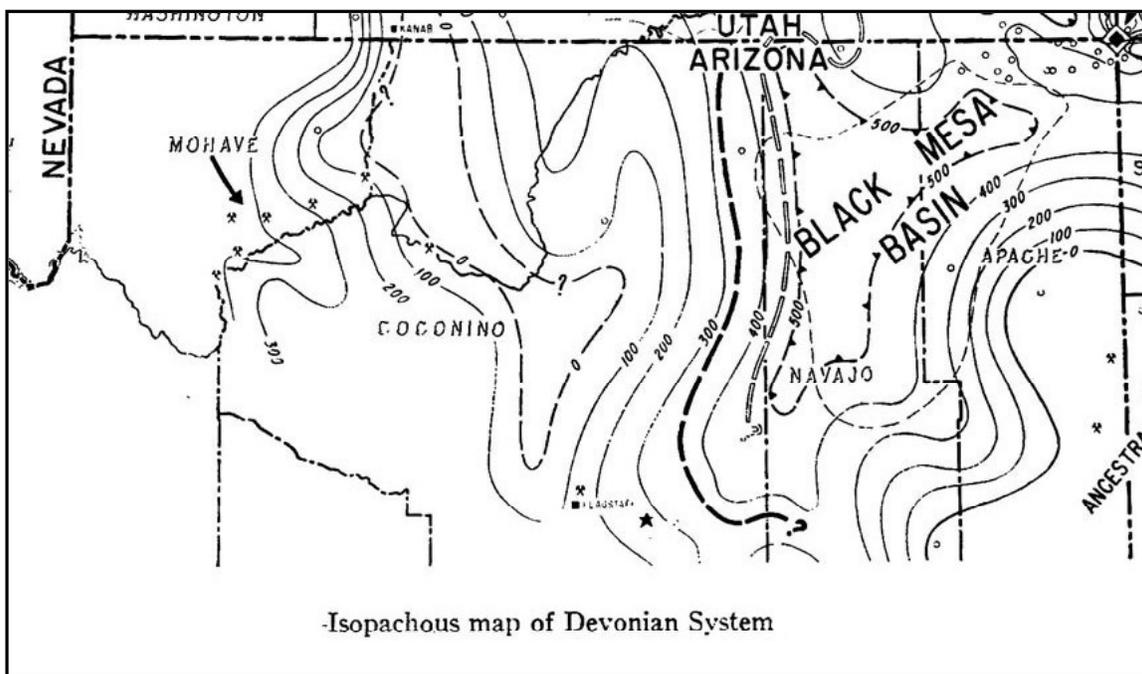


Figure 1. An Isopach (Equal Thickness) Contour Map of Devonian Rocks in Northern Arizona Proving the Existence of a Broad Regional High before and during the Breccia Pipe Uranium Mineralization Process. From Lessentine 1969.

Figure 3 shows³ the relationship of the isopach lines of Figure 1 to the distribution of uranium-mineralized breccia pipes in northern Arizona. The historical data of Figure 3 reveal that none of the breccia pipes west of the 400-foot isopach on the

¹ Lessentine, R.H., 1969, Kaiparowits and Black Mesa Basins - stratigraphic synthesis: *Four Corners Geological Society Guidebook*, pp. 91-113.

² Beus, S. S., 1990, Temple Butte Formation in *Grand Canyon Geology*. Oxford University Press, New York, pp. 107-117.

³ The Figure 3 base map showing the distribution of variously mineralized breccia pipes in northern Arizona is Figure 1 of <http://pubs.usgs.gov/of/1995/ofr-95-0831/CHAP31.pdf>.

west side of the regional basement high contain economic quantities of uranium mineralization. These pipes do contain significant amounts of copper mineralization, however. According to exploration and mining data collected to date, individual breccia pipes located on the west side of the Figure 3 basement high between the 400-foot isopach and the 100-foot isopach both south and north of the Grand Canyon are often uranium-mineralized but usually contain 2,000,000 pounds⁴ or less of uranium ore. Examples of such relatively weakly uranium-mineralized pipes include the Canyon, EZ-1, EZ-2, What, DB-1, Wate, etc. On the west side of the basement high shown on Figure 3, all Arizona breccia pipes previously mined for uranium and containing more than 2,000,000 pounds of uranium ore both north and south of the Grand Canyon are only located east of the Figure 3 100-foot isopach. These very economically-attractive breccia pipe uranium deposits included the already mined high-grade uranium ore of the Orphan, Kanab North, Pigeon, and Hack 2 Mines.⁵

Figure 4 graphically summarizes and confirms the above-described general relationship observed between position of a pipe on the pre-mineralization basement high and the amount of uranium ore deposited in that pipe. Note that these published data points⁶ come from both sides of the Grand Canyon yet consistently support the described mineralization-determining relationship.

Figure 5 illustrates the locations of the three proposed withdrawal parcels with reference to the uranium mineralization-controlling basement high. *As can be seen in Figure 5, the proposed North and South withdrawal Parcels include very large portions of economically-favorable ground east of the 100-foot basement high Devonian system isopach.* In contrast, the proposed East withdrawal Parcel contains very little⁷ structurally-favorable ground that would likely host economic quantities of breccia pipe uranium mineralization. The effects of erosion, sedimentary section down-drop beyond economic exploration and mining depths, and volcanic cover (San Francisco Peak volcanics) aside, the 3,000,000 acre area of

⁴ At current prices and a 10% discount rate, Denison Mines' post-tax break-even ore body size is about 1,200,000 pounds of ore. All other things being equal, on the western side of the northern Arizona basement high all breccia pipe ore deposits discovered west of the 100-foot isopach are break-even or less propositions.

⁵ Extent and rate of uranium production from the Riverview pipe (#26) on the southeast side of the pre-mineralization basement high, just outside of the 100-foot Devonian system isopach was reportedly small in comparison to the modern day scale of commercial breccia pipe mining operations.

⁶ For the sake of confidentiality, only public domain exploration and mining data are used in Figure 4.

⁷ The very slim non-Game Reserve portion of the North Kaibab District of the Kaibab National Forest located between the Game Reserve and House Rock Valley likely contains some pipe-related uranium mineralization. This assessment is made on the basis of earlier field work in the area, and the location of this Kaibab Arch-marginating area on the pre-mineralization basement high.

northern Arizona enclosed by the 100-foot Devonian system isopach appears - judging from historical exploration and mining data and the regional geological considerations discussed here - to possess the highest probability of containing economically uranium-mineralized breccia pipes. See Figures 5 and 6.

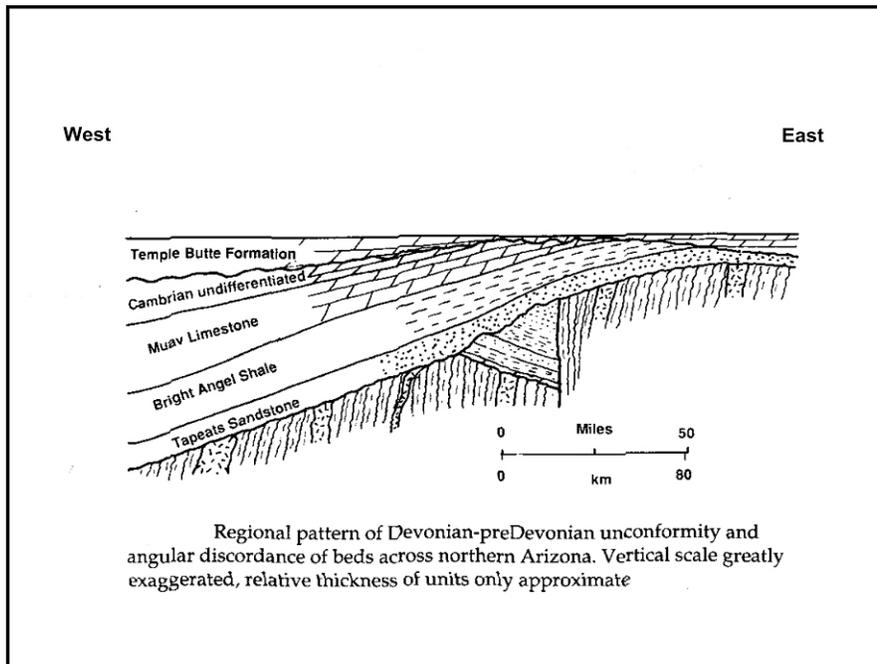


Figure 2. Generalized West to East Vertical Cross-Section of the Pre-Mineralization Basement High Illustrated in Figure 1.

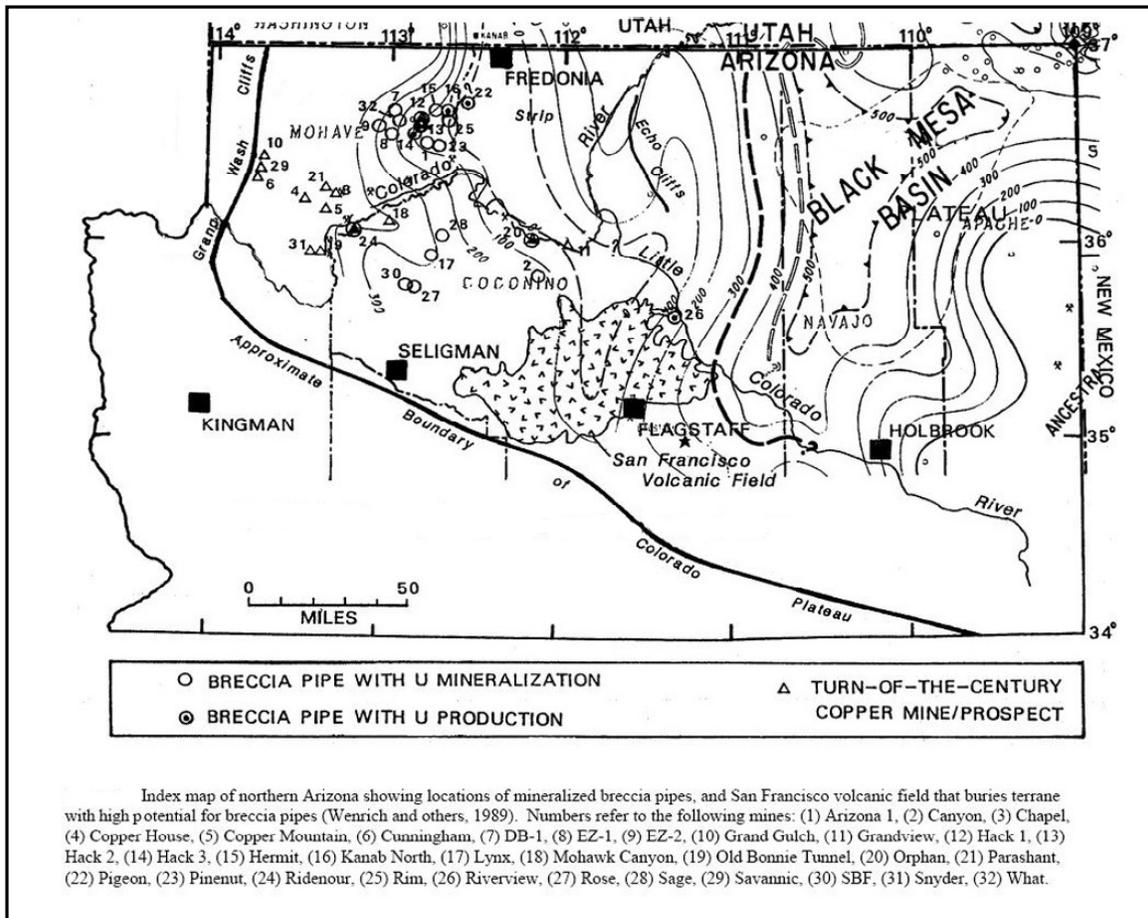


Figure 3. Comparison of the Distribution of Unmineralized, Mineralized, and Economically-Mineralized Collapse Breccia Pipes with the Location of the Pre-mineralization Basement High in Northern Arizona

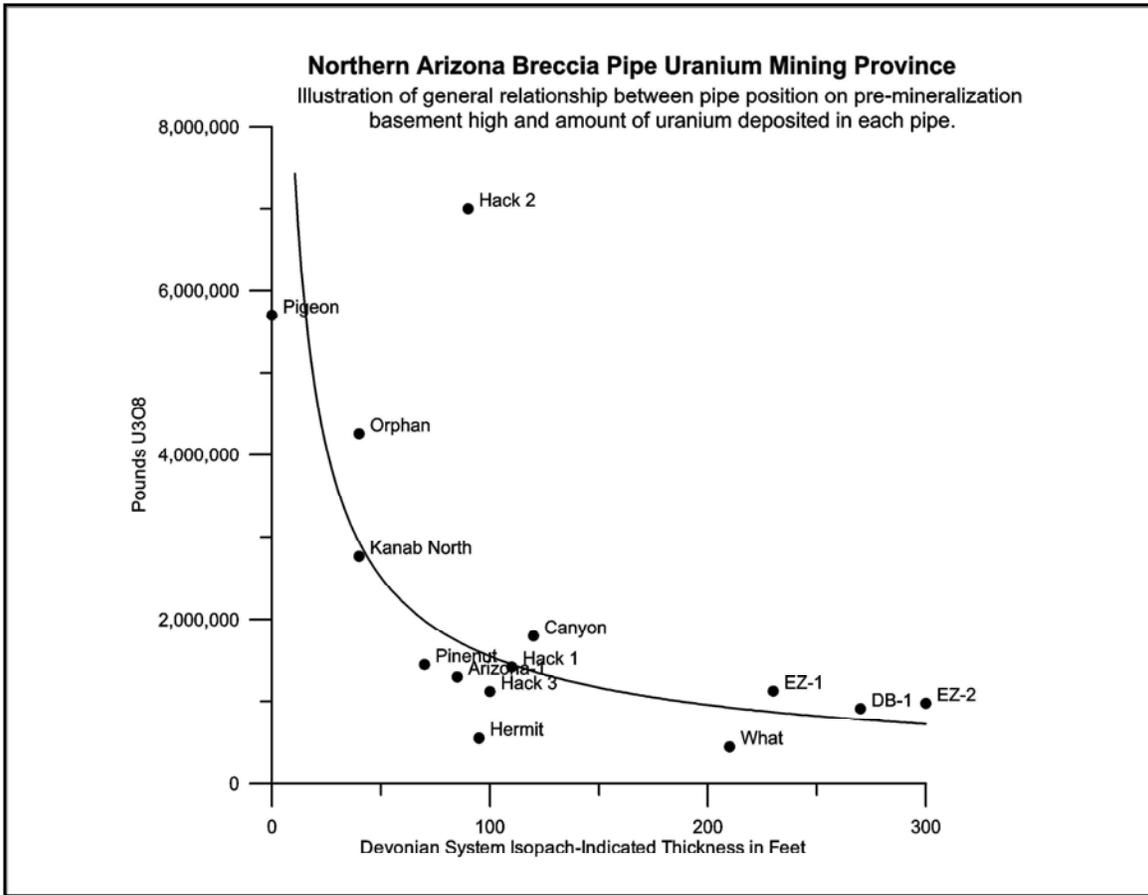


Figure 4. Illustration of the General Relationship between Pipe Position on the Pre-Mineralization Basement High and the Amount of Uranium Deposited in Each Pipe. Uranium resource figures from the Canyon, What, EZ-1, DB-1, and EZ-2 breccia pipes are all drill-indicated reserves, while the pounds U₃O₈ for the rest of the named pipes are more strictly defined original resources from measured production and extensive underground drilling. Of all the pipes shown, only the Hack 2 is a buried pipe example. The rest of the pipes listed exhibit penetration of the present weathering surface by pipe brecciation. The unique 'buried pipe' structural nature of the Hack 2 pipe may explain its placement 'off the curve' in this graph. *Buried pipes like the Hack 2 may turn out to be less or otherwise differently sensitive to position on the pre-mineralization basement high than their surface-penetrating brethren.*

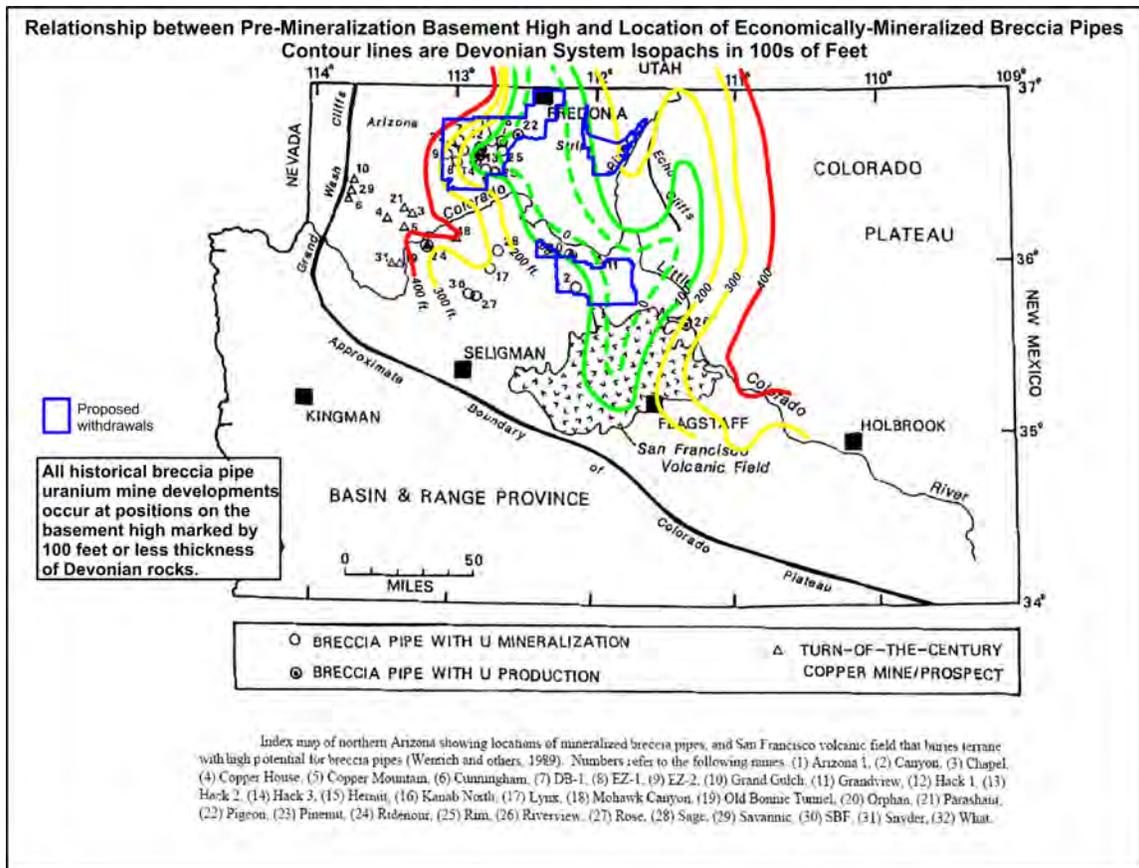


Figure 5. Categorical Distribution of Devonian System Isopachs versus Proposed Withdrawal Area and Pipe Distributions above the Pre-Mineralization Basement High. Pipes found on the far periphery of the high, at isopach thicknesses of 400 feet (red line) or more are not economically uranium-mineralized; those found above (yellow lines) the high at positions between the 400- and 100-foot isopachs are generally weakly-mineralized, containing 2,000,000 pounds of ore or less; and those pipes near or above the 100-foot isopach (green lines) much more frequently contain more than 2,000,000 pounds of uranium ore/pipe. See Figure 4 again for supporting evidence of these representations.

Figure 6 indicates that, prior to July 2009, out of a theoretical maximum of 3,000,000 acres (Figure 5) only 663,000 acres (22%) of the most uranium-prospective ground in northern Arizona were open to breccia pipe uranium exploration and development. The other 2,337,000 acres (78%) of these lands were not accessible to miners due to deep erosion and presence of a National Park (Grand Canyon), Native American ownership and extreme sedimentary section down-drop (Navajo Reservation), Native American ownership (Kaibab Indian Reservation),

volcanic cover (San Francisco Peaks volcanic field), and/or Federal land management policies (Game Reserve- and wilderness-designations).⁸

Figure 7 shows the limited, most geologically favorable lands available to exploration and mining work before the July 2009 segregation period as white spaces surrounded by green lines. Nearly all of the most geologically-favorable 663,000 acres concerned are surface-managed by federal agencies, and mineral exploration rights to these must consequently be acquired by claim-staking.

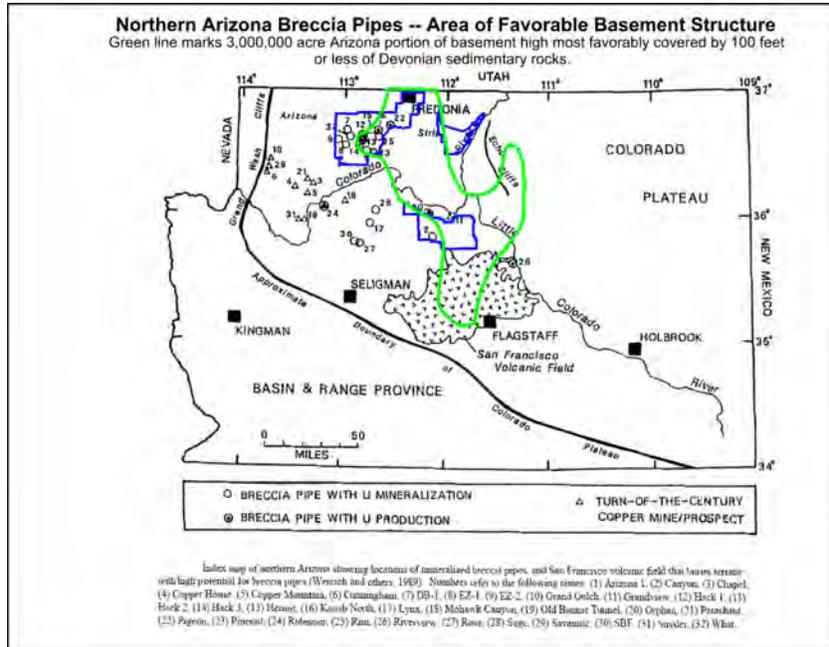


Figure 6. Basement High Area of Greatest Breccia Pipe Uranium Mineralization Potential is Marked by the Green-Line 100-Foot Devonian System Isopach.

⁸For the purpose of considering whether or not leaving the proposed withdrawal areas open to continuing uranium exploration and mine development would harmfully deplete the US uranium resource base against future needs, it is useful to consider how much land prospective for breccia pipe uranium exploration and mining lies within the Game Reserve portion of the North Kaibab District of the Kaibab National Forest and certain parts of the Arizona Strip managed by the BLM. This area directly atop the pre-mineralization basement high is not currently open to mineral entry by mining claim location but does represent about 562,000 acres of extremely prospective breccia pipe terrain - an area 85% as large as that open to mineral entry prior to the July 2009 start of the US Department of Interior-mandated segregation period. The Game Reserve sections of the North Kaibab District of the Kaibab National Forest and the Arizona Strip BLM could, in fact, scientifically be considered to already be 'the US National Uranium Reserve'.

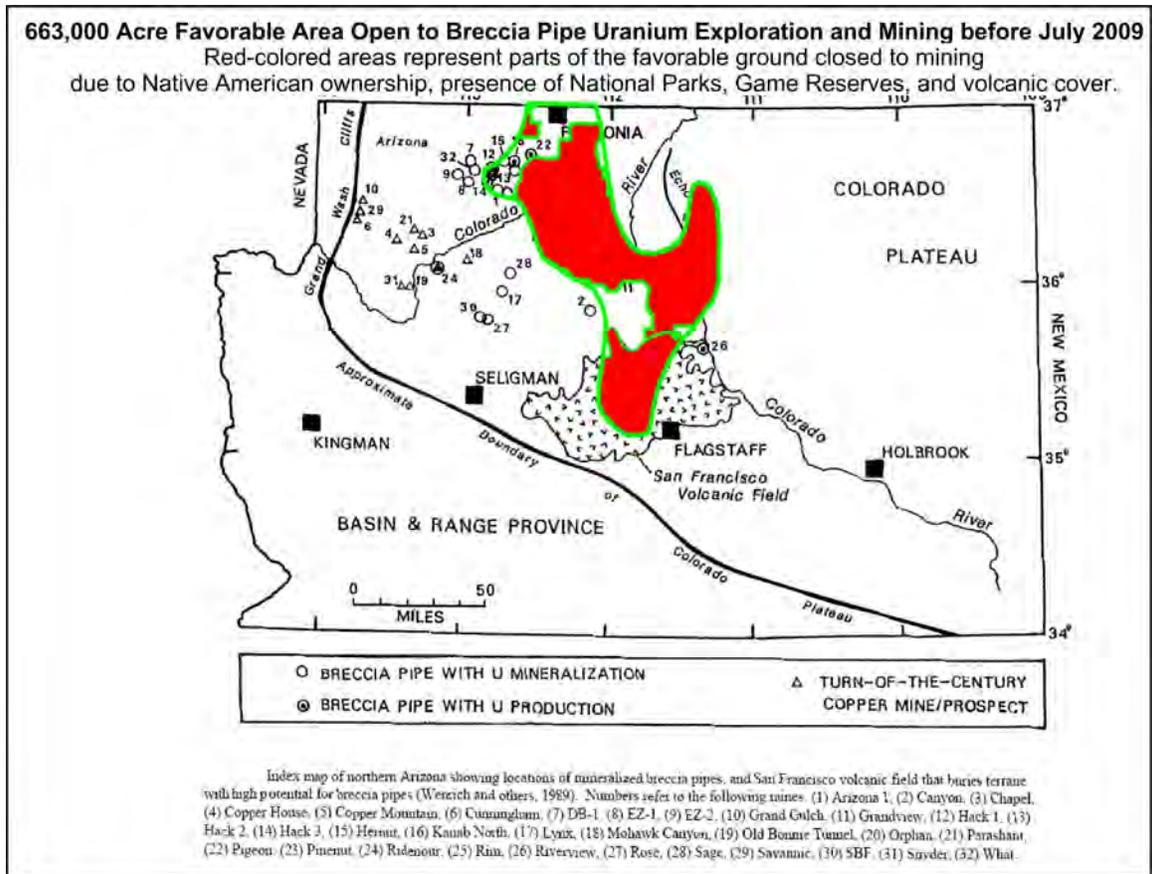


Figure 7. Map of the Very Limited Area open to Uranium Exploration and Mining prior to the July 2009 Start of the 2-Year Segregation Period. Nearly all of the most geologically-favorable lands for uranium breccia pipe exploration and mining are surface-managed by federal agencies and consequently must be claim-staked before exploration work is started.

In the event that the US Department of Interior decides this year to withdraw each of the three parcels currently segregated from mineral entry, the small 663,000 acre area of most geologically favorable ground yet available to mineral explorationists in 2009 would be reduced by 76% (not 12%) to about 158,000 acres. See Figure 8. This 158,000 acres represents only 7.5% of the 3,000,000 acres (Figure 6) of northern Arizona lands geologically most likely to contain economic breccia pipe uranium mineralization.

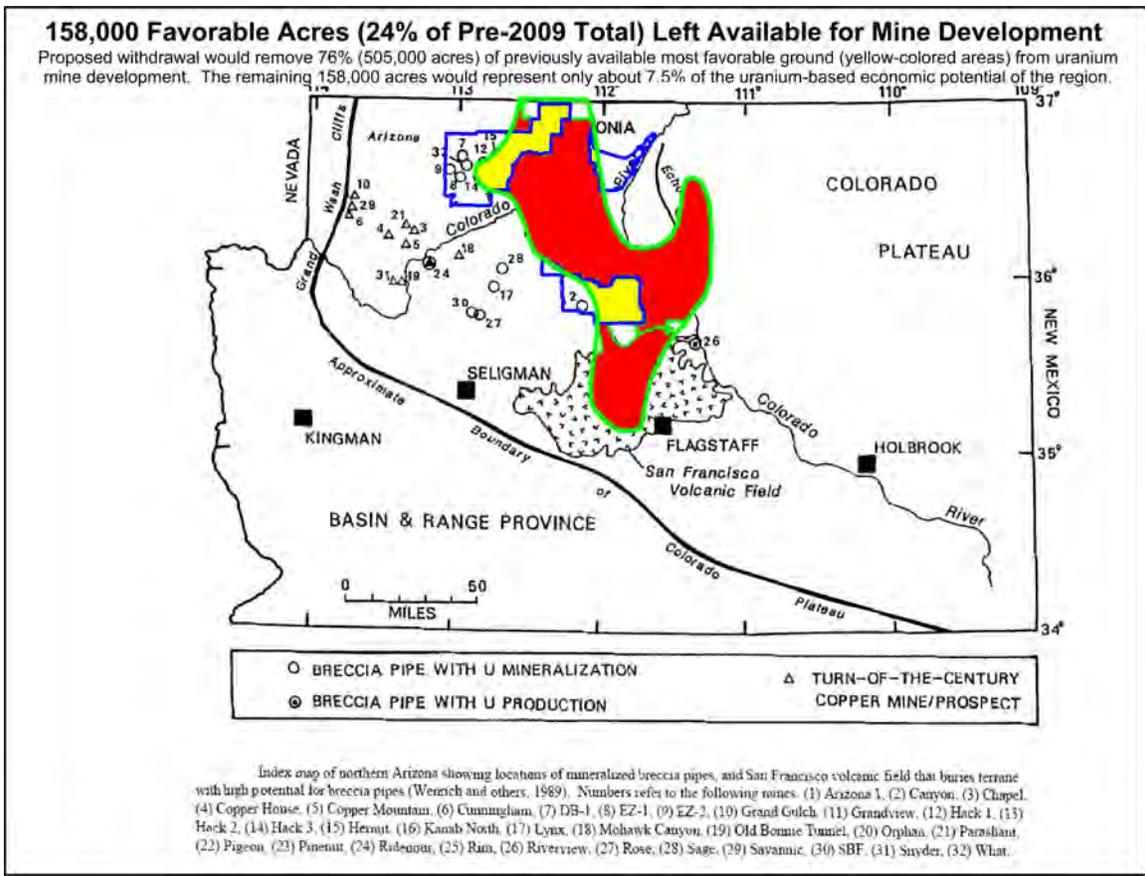


Figure 8. Results of Proposed Withdrawal - Reduction of Remaining Most Favorable and Available Breccia Pipe Exploration and Mining Area by 76%. The remaining green-outlined small white patches of land atop the pre-mineralization basement high total only 158,000 acres or about 7 townships. Such an enormous reduction in favorable exploration area open to mineral entry would strongly decrease the probability that further economically-mineralized uranium-bearing Arizona breccia pipes will be discovered and mined in the future.

In summary, Mr. Florence, DIR recommends that the US Department of Interior drop its proposal to withdraw the North and South Parcels of the proposed mining lands withdrawal. As shown here, to follow through on the DOI's proposed plan with regard to these two parcels will do considerable short- and long-term harm to the Arizona-based uranium mining industry and the northern Arizona/southern Utah domestic economies. However, the geological data we have brought to your attention in this draft EIS commentary indicate that little or no uranium mining industry or other economic harm would result from the withdrawal of the East (Houserock Valley) Parcel.

Thanks for your attention. If your office has any questions about the information provided you here, please do not hesitate to contact us and ask.

Best Regards,

A handwritten signature in black ink, appearing to read "Lawrence D. Turner". The signature is fluid and cursive, with a long horizontal stroke at the end.

Lawrence D. Turner
President/managing geologist
ldturner@dirxploration.com