

Ute Mountain Ute Tribe

Environmental Programs Department

P.O. Box 448

Towaoc, Colorado 81334-0448

(970) 564-5430

November 6, 2020

Ty Howard
Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
Salt Lake City, UT 144880

Re: Public Comment on
Amendment Radioactive Materials License No. UT 1900479
Amendment of the Groundwater Quality Discharge Permit No. UGW370004
Energy Fuels Resources (USA), Inc., White Mesa Uranium Mill, San Juan County, Utah

Dear Director Howard:

Thank you for the opportunity to continue our involvement in decision-making processes regarding the Radioactive Materials License and Ground Water Permit proposed modification by providing sur reply comments in response to those provided by Energy Fuels Resources (USA).

The Tribe has lived on White Mesa since time immemorial and wishes to continue to do so. The protection of its natural resources are vital to the Tribe. The 40 year history of living next to the White Mesa Uranium Mill has seen many changes over the years, and it has also caused controversy and conflict in a variety of ways. We are providing these comments in addition to those submitted on July 10, 2020 regarding the amendment of Radioactive Materials License No. UT 1900479 and Groundwater Quality Discharge Permit No. UGW370004.

Sincerely,

Scott Clow

Director

A handwritten signature in black ink, appearing to read "Scott Clow".



Ute Mountain Ute Tribe Response to EFRI Sur Reply Comments

General Comment:

Regarding the statements by EFRI that “This comment relates to the Mill generally and is not relevant to the License Amendment approval. It is therefore not relevant to this licensing action:”

Comments regarding overall Mill impacts and actions taken by EFRI, including public health and environmental impacts and decisions by the Division regarding major modifications to the Mill’s license, *are* relevant to this action. Comments regarding the Ground Water Discharge Permit are also relevant because the License requires the permit be in effect for the License to be valid.

Organized by Comment Number:

1. EFRI Reply Comments 2.1 – 2.4 to UMUT Comments 4 - 7

UMUT Response:

The 1978 Dames and Moore Environmental Report,¹ referred to by EFRI as the “ER” and relied upon in the NRC’s 1979 Final Environmental Statement (“FES”), expressly stated that the Mill had a projected life of 15 years and made clear that a 15-year project life was the basis of the environmental assessment, *e.g.*:

at p. 1-2: “The mill is planned to have a 2,000 tons-per-day capacity and *a projected life of 15 years.*”

“Each cell is designed to contain a 5-year production of tailing and each will be constructed and used sequentially. **Tailing stabilization and reclamation will be accomplished as soon as possible after each cell is filled, beginning about the fifth year of project operation for the first cell, about five years later for the second cell, and at the end of the project for the third cell.**”

at p. 11-1: “Long-term economic benefits and costs associated with operation of the project are presented in terms of annual projections and *as a 15-year stream*, discounted to the present values.

at p. 3 of Appendix H (Report Site Selection and Tailings Retention and Design Study Mill Facilities White Mesa Uranium Project Blanding, Utah for Energy Fuels

¹ Environmental Report White Mesa Uranium Project San Juan County, Utah prepared by Dames & Moore for Energy Fuels Nuclear, Inc. (January 30, 1978).

Nuclear, Inc. by Dames & Moore January 17, 1978) regarding Design Considerations:

“During the projected 15-year life of the mill approximately 11 million tons of solid tailing will be produced at a rate of 2000 tpd.” [Emphasis added.]

Similarly, the 1979 D’Appolonia report² on the tailings management system expressly assumed a 15-year project life, and a five-year individual cell life:

at p. 1-1: ***“The planned mill capacity is 2,000 tons/day of ore for a 15-year project life.... Tailing stabilization and reclamation will be accomplished as soon as possible after each cell is filled, beginning about the fifth year of project operation for the first cell, about five years later for the second cell, and at the end of the project for the third cell.”*** [Emphasis added.]

The short cell life was a key factor in D’Apollonia’s analysis of the design of the cells and the potential for seepage and settlement. See Section 4.3.2 Geotechnical Analysis and Design, at p. 4-15:

Also, seepage in general, is not considered to be a problem due to the inclusion of a lining inside the cells and the low permeability of the fill materials. The lining, either synthetic or clay, will allow little if any water to ever come in contact with the dike fill. ***Also, the life of any of the cells is short enough so only partial saturation, assuming lining failure, could occur prior to cell filling and abandonment. Therefore, settlement, and seepage are not considered major design factors for this system and are not discussed further.*** [Emphasis added.]

The original ER and D’Apollonia report make clear that the original cells were never designed and their potential for settlement and seepage was never analyzed on the basis of an operational life beyond 5 to 15 years. D’Apollonia dismissed settlement and seepage as major design factors because of the very short operational life of the cells.

In its reply comments, EFRI acknowledges that the Mill has no set operational life and that its tailings cells must be designed to be effective for 1,000 years, to the extent reasonably achievable, and in any case for at least 200 years. Yet, the original ER and tailings design report relied on a short 5- to 15 - year operational life and never evaluated the Mill or the cells on the basis of a 200-year or indefinite operational life.

The Tribe contends that there needs to be an adequate environmental analysis in accordance with UAC 313-24-3 of the Mill and the proposed license modifications based on the projected

² D’Appolonia Consulting Engineers, Inc., Engineer’s Report Tailings Management System June 1979 for Energy Fuels Nuclear, Inc.

indefinite operational life of the Mill beyond 15-years, because such an analysis has never been performed.

EFRI refers to the Tribe's original letter of support for the Mill in 1979. That letter was based on the understanding that the Mill had only a 15-year project life, as stated in the original ER and tailings design report.

In its Reply Comment 2.2, EFRI incorrectly states that the tribes "would not be impacted in any manner different from other potential receptors." Tribal Culture and life ways are not typical American ways of life. While plenty of Native Americans live mainstream American lifestyles, many still do not. Traditional practices such as hunting and gathering and use of spring water in routine life and ceremony are not considered in the original ER and FES.

In its Reply Comment 2.4, EFRI's description of the facility and its ability to operate perpetually does not address Cell 1, the original liquid management cell. After 40 years, the single lined (30mil PVC) cell with only slimes drains and monitoring wells for leak detection is far past its useful operational life. As noted above, the design of Cell 1 and its potential for seepage and settlement were only evaluated on the basis of a short 5- to 15- year operational life. Cell 1 does not meet EFRI's design standard of being "effective for 1,000 years, to the extent reasonably achievable, and in any case for at least 200 years." The mill is equipped with the double-lined Cell 4B with more modern leak detection that is also used for liquid management. A practical and conservative approach to controlling potential releases from Cell 1 would be to close it permanently and divert liquids all to Cell 4B. Cell 1 was not designed for 40 years of use, or for 200 or more years.

The statistic cited by EFRI that 47% of uranium produced at the mill in the last 20 years has been from alternate feed materials demonstrates the significance of the facility for disposal of the other 99% of radioactive materials coming from those sources. It is clearly the model of the mill to be a world destination for such materials, as EFRI is a "member of the global community." The global community of uranium by-products handlers and rare earth processors will continue to ship their materials to White Mesa if these actions are licensed by the Division. White Mesa is becoming the global community destination for other people's radioactive by-products.

2. EFRI Reply Comments 2.5 to UMUT Comment 9.h

UMUT Response:

EFRI states, "Rather than setting GWCL's based on a trend where the GWCLs would increase over time automatically along with the naturally rising background concentrations, DWMC set

fixed GWCLs, recognizing that those GWCLs would need to be re-evaluated each time the rising natural background concentrations reached the set GWCL level.”

The methodology of setting and repeatedly resetting groundwater compliance limits based on a trend that is not predictable and perpetually increasing does not accomplish the goal of decreasing groundwater pollution or preventing degradation of water quality in the aquifer. The method perpetually allows degradation of the Burro Canyon aquifer – which is beneficially used by other users in the area, and does not conform to the goals of the Utah Groundwater Protection Program. It has resulted in many compliance limits exceeding MCLs for various contaminants with no corresponding risk-based analysis to determine that those limits are protective of human health and the environment. This proposed methodology, while not protective of public health or the environment, **would** be very cost-effective for EFRI because it would deflect related consultant fees and remediation costs to the future reclamation period, now estimated to be 20 or more years in the future, and most likely put the long-term remediation cost on the American taxpayer. Increasing trends in contaminant concentrations are not “natural.”

It should be noted that wells with proposed increases in GWCL’s in the proposed modification of the permit are currently approaching or exceeding those proposed GWCL’s already:

MW 11:

Proposed GWCL’s for Mn is 237 ppb, September 2020 result was 230 ppb, August 2020 result was 276 ppb.

MW 25:

Proposed GWCL’s for Cd is 1.6₀ ppb, September 2020 result was 1.61 ppb

MW 30:

Proposed GWCL’s for Se is 53.6 ppb, September 2020 result was 55.3 ppb, August 2020 result was 56.0 ppb.

Proposed GWCL’s for U is 9.82 ppb, September 2020 result was 9.90 ppb, August 2020 result was 10.6 ppb.

Including these under proposed revision, a total of 9 wells had exceedances in the third quarter of 2020. These included measurements of chloride, TDS, nitrate, chloroform, sulfate, uranium, selenium, beryllium, cadmium, fluoride, nickel, manganese, and thallium. There were 28 total exceedances for the quarter of monitoring.³ The degradation is accelerating, and the method for regulating it is not working in reducing the pollution. The Tribe requests that the Division reconsider its methodology for protecting the aquifer.

³ EFRI, Correspondence with DWMRC, DRC Document # DRC-2020-017132

Regarding the 2008 University of Utah study, the Tribe has consistently highlighted that the recommendations in that study for future monitoring include conducting monitoring using innovative age dating and isotopic analyses on wells not included in the original study. With the study being 13 years old, and it would be informative to conduct similar monitoring on some of the same wells, also, to observe any changes in those constituents. While this may seem like a short period of time in the geologic history of the Burro Canyon aquifer, it needs to be put into the context of the facility. No measurable changes in groundwater quality were observed during the first half of the facility's life, but have changed significantly since then, starting with the detection of the chloroform plume. 13 years represents a third of the age of the mill, to date, and the period with the most measured degradation of the aquifer.

While EFRI touts the study as a continuing line of evidence of a lack of mill or tailing cells contamination sources, it is becoming less and less relevant as time goes on. The recommendations for further isotopic monitoring are clearly spelled out by the authors: "CFC concentrations in tritium-free sites suggest a recharge-limited aquifer. This means that if a contaminated fluid was introduced to the system, it would likely be transported by the vertical flow of groundwater and would propagate through the system. This site is, therefore, susceptible to contamination due to tailings cell leakage, and must therefore be carefully monitored for such contamination. Sulfur-34 and oxygen-18 isotopes of sulfate will be useful until the isotopic fingerprint of the surface water sites has propagated through the entire system. Sulfur isotopes that begin indicating input of water with a similar fingerprint as that of tailings cells may be an early indication that a leak in the tailings cell liner has developed. This signal would appear much earlier than elevated metal concentrations because mixing of isotope ratios, with sulfate concentrations as drastically different as between tailings cells and wildlife ponds, is observable after only a very small amount of water has infiltrated (approximately 1% tailings cell water to 99% groundwater). Trace metal concentrations as well as inorganic anions should also be monitored on a regular basis."⁴

In discussions with the DWMRC, it was recommended that the Tribe commission further work in this regard. The Tribe partnered with a graduate student who was fully funded to conduct further monitoring in this manner, but when access to monitor mill wells was requested, it was denied by EFRI. EFRI continues to use a line of evidence that is incomplete and static in time to justify the degradation of a dynamic system. While the heavy metal and anion monitoring is required, the isotopic monitoring that would be most conclusive is not. The Division should require access to the site for further isotopic analysis, commission a new study, or require EFRI to conduct the study.

⁴Hurst and Solomon, 2008, p. 60. Utah Division of Radiation Control, Summary of work completed, data results, interpretations and recommendations For the July 2007 Sampling Event At the Denison Mines, USA, White Mesa Uranium Mill Near Blanding, Utah

3. EFRI Reply Comment 2.9 to UMUT Comment 13

UMUT Response:

No written communication in regards to courtesy notification to the Tribe has been undertaken by EFRI or required by the Division, despite repeated requests by the Tribe. The Tribe provided updated contact information to EFRI in 2019, but no action has been taken to ensure notification will be provided to the Tribe. A commitment to that in writing is what has been requested and contact information has been provided to EFRI as was requested. The representations by EFRI that they sincerely would undertake a notification are not yet proven by their actions. The lack of communication during an air emissions release caused by mill equipment malfunction and a roadside release of ISL waste caused great concern to the community. The Division should add a requirement to the License requiring emergency notification to the Tribe in the event of environmental and transportation incidents.

4. EFRI Reply Comment 2.15 to UMUT Comment 20

The Tribe contends that the surety is sorely inadequate in Comment 20. The mining industry has a consistent history of dissolving U.S. corporations (and returning to foreign countries) when it comes time to clean up after itself. Over and over again, the American taxpayer becomes responsible for the remediation and reclamation costs at sites across the nation. The purpose of the surety is to provide assurance that the responsible party for the site is financially fit to prevent that from happening. While EFRI states in its response that the current surety is adequate, our mining industry experts estimate it to be at least 50% too low. That figure is also

not based on a site to site comparison, but based on the actual estimated reclamation costs, including Davis-Bacon wages. Estimates based on other regional sites, such as Monticello, Shiprock, Grand Junction, and others put the figure much higher- by an order of magnitude.

EFRI's current surety amount is not publicly disclosed. The process of evaluating it annually is also not publicly disclosed. EFRI does a good job explaining the process and legal requirements for the calculation of the surety amount in their response 2.15, but doesn't state what the surety amount is. They state that it is sufficient to remediate all contamination on the site, including groundwater contamination. Yet, the amounts that have been disclosed in recent years, approximately \$20m, have not changed as the groundwater has continued to degrade at the site. Evaluations of the timeframe for remediating the acknowledged and regulated groundwater plumes continue to increase the time it will take to remediate them. Decades if not centuries, if at all. It would be very informative to the Tribe to see how the cost of remediating groundwater at the site is being estimated. The Tribe requests that the Division requires, in the Radioactive Materials license, that the annual surety calculation be publicly available without filing a GRAMA request.

5. EFRI Reply Comment 2.18 to UMUT Comment 24

UMUT Response:

EFRI states, "Because the causes of site-wide pH decrease and corresponding pH-sensitive metals increase have been identified as naturally-occurring, there is no need for additional investigation other than as required for the preparation of the SARs when a GWCL is exceeded at a particular well."

The nitrate/chloride plume is identified as a groundwater contaminant on the mill site and is under order for pumping and treatment. If it is causing pyrite oxidation, relative pH decline and increases in metals concentrations, it is not naturally occurring, but caused by impacts from actions taken at the mill site. Likewise, if an increased level of oxygen is caused by a pumping regime or by the monitoring program, it is not naturally occurring. The preparation of an SAR is not an academic exercise. It is meant to identify the source of the contaminant and guide the process for its ceased contribution and remediation of its impacts.

6. EFRI Reply Comments 2.17 – EFRI 2.31 to UMUT Comments 23-33

UMUT Response:

EFRI has specifically requested a license amendment and alteration to Groundwater Discharge Permit No. UGW370004 (GWDP) to raise ground water compliance limits (GWCLs) which had been developed historically for a variety of indicator parameters. Under the groundwater protection regulatory program, the GWCLs are supposed to be used as an early indication of Mill facility impact to the shallow Burro Canyon groundwater aquifer so that our water resources which we have depended on for millennia can continue to sustain human life and the environment.

The groundwater data which the Mill facility has collected since the 2020 Amendment 10 License Amendment and GWDP revision request show that multiple wells are already exceeding the 2020 proposed increased GWCLs. The 3rd Quarter 2020 Groundwater Monitoring Report Exceedance Notice submitted by EFRI shows that compliance wells MW-11, MW-25 and MW-30 are already in exceedance of proposed limits for manganese, selenium, cadmium and uranium which were already raised in 2018. Further increased GWCLs are planned already for another groundwater discharge permit revision in the near future (October 20, 2020 EFRI letter to Ty Howard, Director UDWMRC Re: State of Utah Ground Water Discharge Permit No. UGW370004 White Mesa Uranium Mill- Notice Pursuant to Part I.G.1(a)).

It is clear that groundwater quality of the Burro Canyon aquifer is rapidly declining in the vicinity of the Mill facility, and the negative trends are continuing unabated. Nearly every one of EFRI's responses to UMUT's numerous comments regarding concern that the Mill facility is currently causing the severe negative decline in water quality in the Burro Canyon aquifer in the

vicinity of the mill site contain misleading statements stating that the pollution is naturally occurring, coming from far upgradient and is nothing to worry about.

The fact is that the water quality of the Burro Canyon aquifer in the vicinity of the Mill facility is rapidly degrading to levels that exceed protective criteria - criteria the State has established to protect our valuable and irreplaceable water resources and human health and the environment. Quarterly groundwater reports (EFRI 2020a, EFRI 2020b, EFRI 2020c) document that groundwater quality is getting worse month by month. The theories advanced by EFRI that the adverse changes are due to an upgradient source or to a natural phenomenon involving pyrite remain unlikely and unproven. Both theories depend on unsubstantiated assertions that EFRI refuses to prove with updated isotopic testing. Both theories ignore risk-based analyses of metals which have increased to toxic levels (cadmium, selenium, thallium, uranium) to potential receptors. In many cases levels of toxic metals are being allowed to exceed MCLs, with no corresponding risk-based analysis of potential adverse impacts to the environment or public health and safety. Environmental health, the health of nearby residents and future generations, and the preservation of the Burro Canyon aquifer as a groundwater resource are threatened by the degrading quality of the of the shallow groundwater at the Mill site, contrary to the objectives of the Utah Groundwater Protection Program. The Division must require that the source(s) of the continuing unabated negative trends in the Burro Canyon aquifer be investigated, positively identified and addressed. The Division must not allow further relaxation of GWCLSs without requiring a risk-based evaluation of the impacts from the degradation that is being allowed to occur and ensuring that compliance levels are protective of human health and the environment.

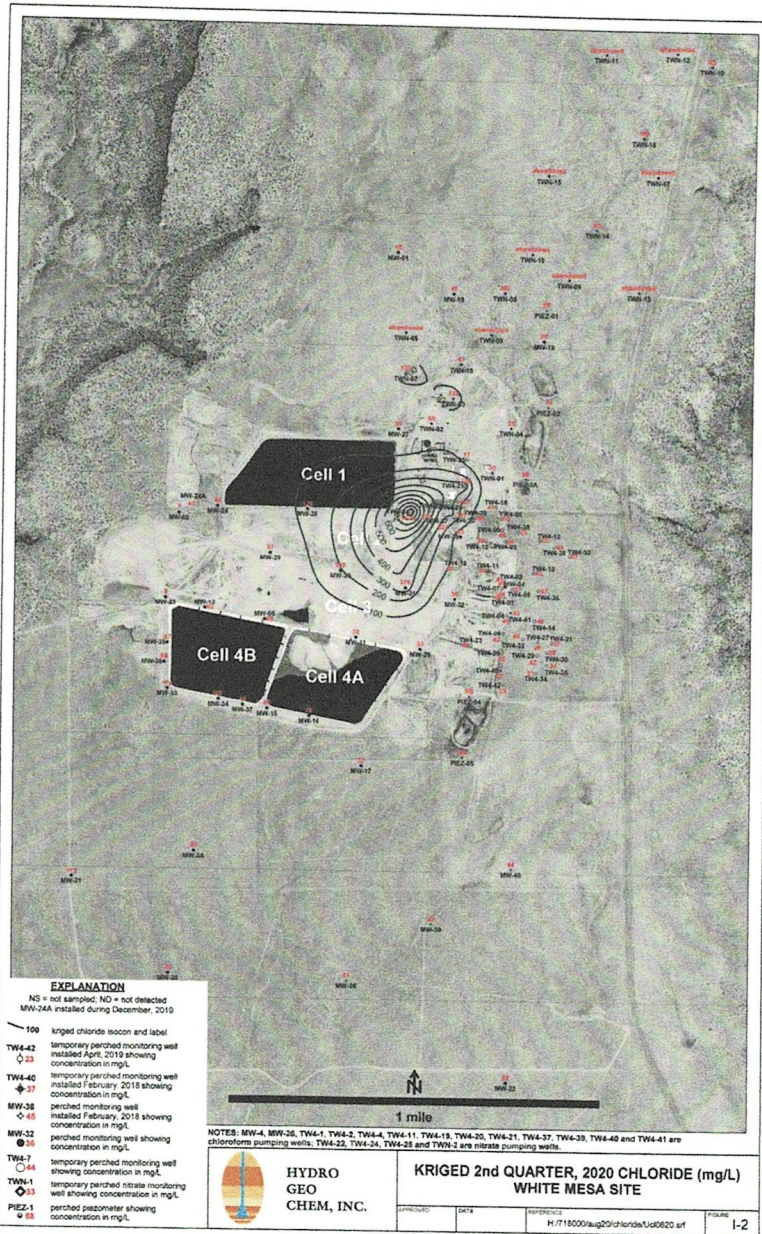
7. EFRI Reply Comment 2.18 -2.30 to UMUT Comments 23- 32

UMUT Response:

The Division must recognize that declining pH is not site-wide in nature and that EFRI's unsubstantiated pyrite theory cannot explain the decline in groundwater quality at monitoring wells such as MW-30, for example, which has exhibited a trend of rising pH since 2016 and is currently well above pH 7. MW-30 was measured at pH 7.19 on April 6, 2020 from the 2nd Quarter Groundwater Monitoring Report August 17, 2020 Energy Fuels Resources (USA) Inc.), and is currently exceeding GWCLSs for four indicator parameters including Nitrate, Chloride, Selenium and Uranium. Rising pH is directly inconsistent with EFRI's pyrite theory.

The source of the chloride plume is not migrating from a far upgradient location, the source is clearly centered near the SE corner of Tailings Cell 1 as the data from TW4-24 and other nearby wells show and the chloride concentration map from the second quarter 2020 nitrate groundwater report illustrates:

(EFRI, 2020c)



(EFRI, 2020c)

EFRI's comments that the POC wells which are experiencing a dramatic reduction in pH can be explained both by the reduction of nitrate by pyrite which depends on the absence of oxygen and by the "over pumping" of monitoring wells in the aquifer which has oxygenated the aquifer are directly inconsistent. Which is it? The nitrate plume existence by itself proves the aquifer has been oxygenated for a long period of time, regardless of whether the source is the ammonium sulfate tanks which could not be ruled out as a source or the tailings management system which has incorrectly been ruled out as the source. The nitrogen source is in the form of ammonium which is getting turned into nitrite and then into nitrate in the subsurface- this

physical process depends on oxygen. Therefore, EFRI's varying explanations of the aquifer being anoxic and/or suddenly oxygenated are contradictory and entirely false. All source assessment reports completed which rely on the pyrite theory need to be re-assessed.

Monitoring well MW-28 belongs in the same category as MW-30. This well also has increasing uranium and selenium concentrations, and the pH is not decreasing. Continued increases in selenium and uranium during periods where pH does not appear to also increase does not support the pyrite argument. And the fact that pH decreases are not associated with increases in sulfate- also contradicts the pyrite theory. Both a sulfate increase and a pH decline would be expected if the pyrite theory were valid. These trends are not evident.

In conducting a source assessment of groundwater contaminants, it is improper to disregard that the facility can be impacting the groundwater unless chloride by itself or with sulfate and fluoride are present. Chloride, sulfate and fluoride are generally considered non-reactive anions which travel readily in water. The Burro Canyon formation contains mineral and physical variabilities, and the tailings cells are contain an entirely unique concentrated brew of toxic radioactive sludge, and liquid. Solutes from the tailings and dissolved in groundwater would be subject to a variety of different processes where they could be transformed or removed from the groundwater including undergoing chemical precipitation, participating in oxidation/reduction reactions, being subjected to abiotic and biodegradation and sorbing onto mineral grains, clays or organic carbon that may be present in different zones of the aquifer.

No site-specific work has been done to characterize retardation and transformation of the solutes in the tailings management system liquids as they would react with the actual aquifer material at the site has not been done. The 2019 Annual Tailings Management report shows that chloride concentrations are reduced 23.3 percent from the Cell 4B liquid when it passes through the cell liner to the leak detection system. We have previously submitted literature citations of chloride being filtered out of water in shale and sandstone formations like the ones at White Mesa (White Mesa Mill Radioactive Material License and Groundwater Discharge Permit, Ute Mountain Ute Tribe comments. July 14, 2017). Toxic metals like beryllium, cadmium and thallium from the tailings could be leaking and being transported at a faster rate compared to ions like chloride due to colloid facilitated transport (Fetter, 2018) of metals.

Well TW4-24 is immediately adjacent to the Tailings Management System (TMS) and is downgradient of Cell 1. It has exhibited a rising trend in concentrations of both nitrate and chloride since 2007 (EFRI, 2020a). TW4-24 had historically only been sampled for chloride and nitrate. However, in response to the Tribe's concerns that leaks from the TMS could be concealed by the large number of pumping wells as on the east side of the Mill property and the corresponding lack of point of compliance wells in that area for the TMS (UMUT, 2017), UDWMRC added a license requirement for TW4-24 to be included as a general monitoring well and be sampled for an expanded suite of analytes which could assist in detecting facility impact and identifying sources of pollution.

Sampling at TW4-24 conducted since 2018 has shown that uranium concentrations at this location are nearly 800 ppb (776 ug/L, 4/8/20, EFRI 2020a) which is a dangerous and un-natural concentration. UDMRC has previously agreed that testing the activity ratio of uranium isotopes would be a useful technique to evaluate uranium concentrations (July 9, 2012 public meeting in Blanding, UT https://deq.utah.gov/legacy/businesses/e/energy-fuels-resources-usa/docs/2012/08Aug/2012USGSReport_070612.PDF). The Division should require EFRI to conduct testing of the activity ratio of uranium isotopes without delay to determine whether this level of uranium is a natural phenomenon or attributable to the TMS.

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