



ATOMIC SAFETY  
AND LICENSING  
BOARD PANEL

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 17, 2019

Ms. Nicole Gorman  
University of Notre Dame  
Department of Biological Sciences  
100 Galvin Life Science Center  
Notre Dame, IN 46556

Dear Ms. Gorman:

I am responding to your letter regarding the 2018 Environmental Assessment for the Crow Butte Resources, Inc., Marsland Expansion Area license amendment application. The letter states your opposition to the license amendment and appears to be substantively similar to letters that were received on or about June 19, 2019, addressed to the Office of the Secretary and to Atomic Safety and Licensing Board Panel Chief Administrative Judge E. Roy Hawkens. The Acting Secretary responded to those letters on July 1, 2019 and served the response and the letters on the docket for the Crow Butte Marsland proceeding.

The Atomic Safety and Licensing Board issued an initial decision in the Crow Butte Marsland matter on February 28, 2019 (LBP-19-2) and terminated the proceeding. An appeal is currently pending before the Commission. As the Acting Secretary explained in her July 1 response, it would be inappropriate to discuss or comment on your letter given the pendency of the adjudication.

I am forwarding a copy of your letter and this response to be served on the docket for the Crow Butte Marsland proceeding.

Sincerely,

/RA/

G. Paul Bollwerk, III  
Administrative Judge

Nicole Gorman  
ngorman@alumni.nd.edu  
University of Notre Dame  
Department of Biological Sciences  
100 Galvin Life Science Center, Notre Dame, Indiana 46556

Administrative Judge G. Paul Bollwerk III  
Atomic Safety and Licensing Board Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C., 20555

### **Resource and Environmental Justice Issues with Crow Butte Uranium Mining Expansion Plan**

Review of the U.S. Nuclear Regulatory Commission Office of Nuclear Material Safety and Safeguards  
2018 Environmental Assessment for the Marsland Expansion Area License Amendment Application,  
available at <https://www.nrc.gov/docs/ML1810/ML18103A145.pdf>.

The environmental injustice presented here is that the Crow Butte uranium mining expansion plan that is being proposed in Marsland, Nebraska, by Cameco Corporation has great potential for environmental harm that will disproportionately negatively affect the residents of the Pine Ridge Reservation. The environmental impact assessment put forth by the U.S. Nuclear Regulatory Commission and Cameco Corporation claims that there will be little environmental impact and no environmental injustice as a result of the expansion because the impacts on the Native American peoples in the vicinity of the mine will be small. Approving the Crow Butte in-situ uranium recovery expansion into Marsland, Nebraska, is an unwise use of economic resources because there is currently no need for further uranium mining and old uranium mines in the U.S. need to be restored; and is an environmental justice issue because the proposed uranium is contained in an aquifer, Indigenous groups are experiencing health problems due to uranium mining, and the Oglala Lakota people are not equipped to handle uranium contamination. This environmental injustice is important because uranium contamination is very dangerous when it reaches groundwater, but has not gained enough attention from the U.S. government to create effective legislation to prevent harm due to uranium contamination. In addition, Native American communities all over the western U.S. have been subject to health problems due to uranium contamination for almost a century, and further damage should be prevented.

#### **Arguments:**

##### **There is No Economic Need to Expand Uranium Mining**

The Crow Butte uranium expansion plan is an unwise use of economic resources because there is currently no need for expanding uranium mining. Nuclear energy is in decline in the United States, with operating nuclear reactors in the U.S. decreasing in number from 99 to 89 by 2025, and the remaining number could be halved by 2034. Meanwhile, only one new reactor is being proposed (Ferguson et al., 2017, 3-4). Outside the U.S., the decline in nuclear reactors is global and every country is closing reactors with the exception of China. For example, Germany is planning on closing all its reactors by 2025



(Ferguson et al., 2017, 3-4). In addition, renewable energy technology is continually improving, causing U.S. wind power to grow over nine percent in 2017 and solar power to grow between ten and 20% every year (AWEA 2017, v; U.S. Energy Information Administration, 2018). The 2017 growth in wind is part of a long-term trend, demonstrated by the fact that wind has comprised 30% of all U.S. energy capacity additions from 2007 to 2017 (U.S. DoE, 2017a). Other countries are experiencing similar wind growth, with wind providing 48% of Denmark's energy and 30% of Ireland and Portugal's energy (U.S. DoE, 2017a). Due to advances in renewable energy, nuclear is now the most expensive power option in the U.S., costing 14.8 cents/kilowatt hour while solar costs 5c/kwh and wind costs 4.5 c/kwh (Lazard, 2017). There is simply no demand for expanding mining operations when nuclear energy is in decline.

*Objection:* Cameco Corporation, the owner of Crow Butte, stated that expansion plans will be developed, "as market conditions warrant" (Cameco Corporation, 2018b). They claim that they have a positive long-term outlook for the uranium industry, and that there is demand for nuclear energy as a clean and safe energy option (Cameco Corporation, 2018e).

Market conditions do not support Cameco expansions of uranium mining efforts, demonstrated by Cameco's financial struggles in recent years. Cameco has been closing other uranium mines such as McArthur River and Key Lake in Canada, which was previously the world's largest uranium operation, but has been closed indefinitely as of July 2018. Cameco has also closed the Smith Ranch-Highland mine in Wyoming, which effectively ceased production in 2016 (Cameco Corporation, 2018c; Cameco Corporation, 2018d). As a company, Cameco has been involved in expensive tax battles with both the American IRS and the Canadian CRA (Market Wired, 2017; Federal Court, 2017). These have not only cost Cameco money and time, but have illustrated tensions between the company and the American and Canadian governments. Finally, Cameco has had financial struggles recently due to low uranium demand, with a net loss of \$205 million in 2017 and a calculated 36% chance of bankruptcy (Cameco Corporation, 2018a; Macroaxis, 2018). These conditions indicate that Cameco is struggling as a company and does not currently have the capacity or demand for a mine expansion, but is attempting to make up some of its financial losses with an expansion. Licensing a mine expansion to a company that is experiencing such financial difficulties is a risky decision that would reflect poorly on and be costly for the government if Cameco failed.

### The United States Has a Poor Uranium Remediation Record

The Crow Butte uranium expansion plan is an unwise use of resources because the U.S. has struggled to restore uranium mines in the past. Old uranium mines have yet to be restored, with the U.S. currently containing 4,225 known abandoned and unrestored uranium mines that it purchased and the EPA only having enough funds to begin assessing, but not cleaning, 219 of the 523 abandoned uranium mines on Navajo Nation alone (U.S. DoE, 2017b; U.S. EPA, 2018b). Currently, there are only 11 active uranium recovery sites in the United States, making abandoned and unrestored mines 99.7% of the total uranium mines in the U.S. (U.S. NRC, 2018b). This proportion further illustrates the dramatic decrease in mining activity throughout recent history. In addition, no federal legislation exists regarding the responsibilities of companies in restoring their completed uranium mines. The Atomic Energy Act does not extend to uranium mining process, only the refining process (U.S. EPA, 2018c). As a result, restoration is designated as the responsibility of the individual states, Bureau of Land Management, and companies (U.S. EPA, 2018c). In this case, the states will not have consistent legislation and companies will attempt to close mines with as little remediation as possible. In 2018, the EPA decided not to pass an Obama-era regulation proposal requiring hard rock mining operations, including uranium operations, to prove that they have the funds to clean up their mines before the EPA licenses them. Without this legislation, mining companies can go bankrupt or simply abandon their mines, leaving the federal government no choice but to use taxpayer money to stop any contaminants from leaking out of the mines (U.S. EPA, 2018a).



*Objection:* In the expansion environmental impact assessment, the U.S. Nuclear Regulatory Commission states that Nebraska legislation requires that, “any mineral exploration hole activities affecting land resources of the State shall ensure restoration to a condition consistent with the land use existing prior to the exploration” and that surface reclamation such as “revegetation and recontouring” will occur (U.S. NRC, 2018a, 4-1, 4-5).

Current regulations are not enough to ensure proper restoration because federal legislation is non-existent and state legislation is vague and sparse. The Marsland expansion’s proximity to South Dakota opens up the potential for contamination across state lines. If contamination from Marsland leaves Nebraska, the consequences will be Crow Butte’s responsibility, as other states cannot regulate mines that are not within their boundaries (Cameco Corporation, 2018f; National Research Council, 2012, 227). In addition, Cameco has not yet remediated any of its three U.S. uranium mines and the lack of federal legislature on uranium cleanup has caused the federal government to be uninvolved in this process, leaving it up to state legislation (U.S. EPA, 2018c). When contamination crosses state lines, the legislation could be mismatched and cause bureaucratic issues with enforcing cleanup. In addition, the “revegetation and recontouring” mentioned in the Nebraska restoration law is not an urgent restoration step like addressing water contamination, and the environmental impact assessment does not address aquifer or water contamination because the impact is predicted to be “small” (U.S. NRC, 2018a, 4-5). Finally, the “land use existing prior to the exploration” referenced in the environmental impact statement in this case is land unused for any human purpose, so the end restoration goal here is very vague (U.S. NRC, 2018a, 4-5). Both federal and state legislation do not effectively prevent uranium contamination or ensure restoration.

#### Contamination of the Ogallala Aquifer

The Crow Butte uranium expansion plan is an environmental justice issue because the proposed uranium is contained within an aquifer, which is a part of the greater Ogallala Aquifer. Because the uranium is contained within an aquifer, it creates the risk of uranium contamination of neighboring aquifers due to the aquifer bordering faults (U.S. NRC, 2018a, 3-10, 3-14). In this location, the risks of contamination in this aquifer are threefold: secondary porosity in the form of joints and faults, thinning and pinching confining layers of non-porous rock, and perforations made by improperly cased or capped wells (LaGarry, 2018, 2). In addition, the environmental impact assessment refers to the geology of the aquifer by the wrong stratigraphic name, calling it the Basal Chadron Sandstone Formation, rather than Chamberlain Pass Formation, indicating the statement’s fundamental misunderstanding of the area’s geology (U.S. NRC, 2018a, 3-34; LaGarry, 2018, 4). An environmental impact statement must demonstrate knowledge of the geology of the area to effectively assess the risks associated with undertaking a new project.

*Objection:* Cameco Corporation claims, “in all its years of operation, Crow Butte has never polluted a neighbor’s well or contaminated waters downstream” (Cameco Corporation, 2018b). In addition, Cameco is, “committed to discharging water responsibly in the areas we operate to ensure that risks to the receiving environment comply with and move beyond legal and other requirements” (Cameco Corporation, 2016).

Cameco has not claimed responsibility for contamination at Crow Butte, but private well testing has indicated that the levels of uranium above EPA standards found in Pine Ridge Reservation groundwater is sourced from decades of mining at Crow Butte because the reservation is downstream of the mine, the secondary porosity of the surrounding rock allows for movement of contaminants, and there is a physical pull of water from the mine to the reservation (U.S. NRC, 2015, 4; USGS, 2014, 1). In addition, Crow Butte has violated regulations in the past, such as when they were forced to pay Lancaster



County, Nebraska, \$50,000 for releasing drilling water above the ground every day from 2003 to 2006, possibly contaminating surface or groundwater in the area (State of Nebraska, 2008, 1-4). The fine was paid and the releasing practices were stopped, but remediation practices were not put in place, even though the release occurred for three years and took two more years to address. Cameco has also contaminated water in other sites the past, for example in Port Hope, Ontario, where 1.7 million cubic meters of arsenic and uranium contaminants were leaked from Cameco's nuclear conversion facility and reached Lake Ontario (French, 2008; Cameco Corporation, 2010, 62-63; Pitkanen, 2017, 99). This history of contamination and evasion of restoration efforts makes claims that Cameco does not contaminate water unreliable.

#### Native Americans are Experiencing Health Issues due to Uranium Contamination

The Crow Butte uranium expansion plan is an environmental justice issue because Indigenous groups such as the Navajo are experiencing health issues due to uranium mining such as decreased autoimmune function, lung cancer, kidney disease, decreased reproductive function, and bone cancer, the effects of which are not limited to mine workers, but extend to people living near old mines. Some Navajo communities have high uranium levels in 27% of studied people's urine, while the U.S. average is 5% (U.S. EPA, 2014, 1-2; Arnold, 2014, A44). Health costs due to uranium miner deaths were estimated to be between \$22.4 million and \$165.8 million annually from 1955 and 1990 (Jones, 2014, 291). Today, as cancer and other health problems afflict contaminated people, the annual cost contuse to be in the millions of dollars. Lakota women on the Pine Ridge Reservation are experiencing reproduction issues stemming from previous uranium mining. While there has always been poverty at Pine Ridge, the reproductive issues did not begin until uranium contamination was documented (Hoover et al., 2012, 1646). These health issues will continue to be prevalent if these people are subjected to more uranium contamination.

*Objection:* The mining which is currently affecting the Pine Ridge Reservation is primarily from defense-related mines commissioned by the U.S. government during the Cold War (Jarding, 2010, 21). At the Geological Society of America 2011 Annual Meeting, it was reported that water with uranium content up to 60 ppb in surface water and up to 40 ppb in groundwater was found at Pine Ridge (EPA limit 30 ppb), but the GSA suspected that the uranium was occurring in water naturally (Botzum et al., 2011, 125).

There is not sufficient evidence of safety to allow the Marsland expansion because it is impossible for Crow Butte to report if it has already caused contamination because Cameco subsurface testing at the site has not occurred since before mining began (U.S. NRC, 2013, 1). The lack of recent subsurface testing may be a result of Cameco's reluctance to officially find contamination, as it would be expensive to deal with, as demonstrated when they have committed past contamination crimes. Therefore, only private well testing in the surrounding area can be used to determine contamination, since Cameco will not perform its own testing. In addition, Native Americans in the Northern Plains region experience a 40% higher cancer mortality rate than the general population and these effects could last for more than 1,000 more years and should not be subjected to more risk (Hoover et al., 2012, 1646). Additional contamination should not be risked because the effects of uranium contamination are widespread due to its ability to travel with groundwater and long-lasting, with uranium half-life being 245,000,000 years (Dewar, 2013, 470; Cheng et al., 2000, 28). These effects would be devastating to Indigenous peoples who must stay in one location on their reservation to preserve their cultural identity. As a result, moving away from contaminated water is not an option for many affected people.

#### The Oglala Lakota People are not Equipped to Handle Contamination

The Crow Butte uranium expansion plan is an environmental justice issue because the Oglala Lakota people of the area surrounding the proposed expansion area are not equipped to handle uranium contamination. Pine Ridge Reservation is the poorest reservation in the United States with a poverty level



of 41.7% in 2016 (U.S. Census Bureau, 2016). It is also located in the poorest county of the U.S. and has had an unemployment rate exceeding 70% since the 1980s (Pickering, 2000, 149). The health needs at Pine Ridge are met by one small hospital and two small clinics, and Oglala Lakota County is ranked 59<sup>th</sup> for overall health outcomes, 60<sup>th</sup> for quality of life, and 55<sup>th</sup> for clinical care of 60 South Dakota counties (University of Wisconsin, 2018). Finally, Native American tribes in the U.S. are sovereign nations, so the Oglala Lakota people in Pine Ridge are not protected by the same environmental laws to which the states are subject (BIA, 2018).

*Objection:* The NRC in the expansion environmental impact assessment concluded that the expansion, “would not result in disproportionately high or adverse impacts on minority or low-income residents on the Pine Ridge Indian Reservation” and that, “the overall impacts on environmental justice would be small” (U.S. NRC, 2018a, 4-45).

The environmental justice portion of the environmental impact assessment did not adequately assess the potential impacts to vulnerable populations because only risks to populations within a four-mile radius of the expansion site were assessed and the aquifer that could be contaminated, the Ogallala Aquifer, extends throughout Nebraska and into South Dakota and six other states, underlying 174,000 square miles of land (U.S. NRC, 2018a, 4-44; USDA, 2018; USGS, 2007). Therefore, the effects will far exceed the four-mile boundary addressed in the environmental impact statement. In addition, all types of uranium mining emit radiation, of which there is no safe dose, and other byproducts such as heavy metals, so no matter how small the contamination, there will be negative effects (Jarding, 2010, 4). In-situ mining pollutes groundwater by definition, which allows contamination to travel as far as the aquifer extends (Jarding, 2010, 12; LaGarry, 2016, 6). Additionally, the environmental justice issues with the Crow Butte mine are not only health-related, but also cultural, with the NRC failing to properly consult with the Oglala Lakota Tribe when renewing Crow Butte licenses, even though it sits on ancestral Tribe lands (U.S. NRC, 2016, 4). Finally, Cameco has deferred groundwater cleanup at its mine sites in 2009, 2010, 2012, 2013, and 2018, including a ten-year extension on groundwater restoration at Crow Butte in 2016, despite potential contamination’s ability to continue spreading over the ten-year timeframe (U.S. NRC, 2017, 1-2). While Cameco continues to defer cleanup, the people of Pine Ridge will continue to experience the health consequences they have been subject to since the 1960s. It would not make sense to defer cleanup if there was no contamination to cleanup. Therefore, this indicates that Cameco is aware that remediation will be necessary and wishes to put off the cost to the future.

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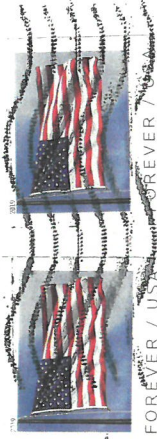
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N. GORMAN  
UNIVERSITY OF NOTRE DAME  
DEPT. BIOLOGICAL SCIENCES  
100 GALVIN LIFESCIENCE CENTER  
NOTRE DAME, IN 46556

FT WAYNE IN 468

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ADMINISTRATIVE JUDGE G. PAUL BOWLERK III  
ATOMIC SAFETY AND LICENSING BOARD PANEL  
U.S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON D.C. 20555 T-3A2





UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
CROW BUTTE RESOURCES, INC.	)	Docket No. 40-8943-MLA-2
	)	
In-Situ Leach Uranium Recovery Facility,	)	ASLBP No. 13-926-01-MLA-BD01
Crawford, Nebraska	)	
	)	
(License Amendment –	)	
Marsland Expansion Area)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **Letter from Administrative Judge G. Paul Bollwerk to Nicole Gorman** have been served upon the following persons by Electronic Information Exchange.

Office of Commission Appellate  
Adjudication  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
E-mail: [ocaamail@nrc.gov](mailto:ocaamail@nrc.gov)

Atomic Safety and Licensing Board Panel  
U.S. Nuclear Regulatory Commission  
Mail Stop T-3F23  
Washington, DC 20555-0001

G. Paul Bollwerk, III, Chair  
Administrative Judge  
E-mail: [paul.bollwerk@nrc.gov](mailto:paul.bollwerk@nrc.gov)

Dr. Richard E. Wardwell  
Administrative Judge  
E-mail: [richard.wardwell@nrc.gov](mailto:richard.wardwell@nrc.gov)

Dr. Thomas J. Hirons  
Administrative Judge  
E-mail: [thomas.hirons@nrc.gov](mailto:thomas.hirons@nrc.gov)

Law Clerks  
Joseph D. McManus  
E-mail: [joseph.mcmanus@nrc.gov](mailto:joseph.mcmanus@nrc.gov)  
Taylor Mayhall  
E-mail: [taylor.mayhall@nrc.gov](mailto:taylor.mayhall@nrc.gov)  
Molly Mattison  
E-Mail: [molly.mattison@nrc.gov](mailto:molly.mattison@nrc.gov)

U.S. Nuclear Regulatory Commission  
Office of the Secretary of the Commission  
Mail Stop O-16B33  
Washington, DC 20555-0001  
Hearing Docket  
E-mail: [hearingdocket@nrc.gov](mailto:hearingdocket@nrc.gov)

U.S. Nuclear Regulatory Commission  
Office of the General Counsel  
Mail Stop O-14A44  
Washington, DC 20555-0001  
Susan Vrahoretis, Esq.  
E-mail: [susan.vrahoretis@nrc.gov](mailto:susan.vrahoretis@nrc.gov)  
Marcia J. Simon, Esq.  
E-mail: [marcia.simon@nrc.gov](mailto:marcia.simon@nrc.gov)  
Robert G. Carpenter, Esq.  
E-mail: [robert.carpenter@nrc.gov](mailto:robert.carpenter@nrc.gov)  
Krupskaya Castellon, Paralegal  
E-mail: [krupskaya.castellon@nrc.gov](mailto:krupskaya.castellon@nrc.gov)

**Letter from Administrative Judge G. Paul Bollwerk to Nicole Gorman**

OGC Mail Center:

[OGCMailCenter@nrc.gov](mailto:OGCMailCenter@nrc.gov)

W. Cindy Gillis, Esq.  
522 Seventh Street, Suite 202  
Rapid City, S.D. 57701-2756  
Counsel for Oglala Sioux Tribe  
Email: [cindy@mariogonzalezlaw.com](mailto:cindy@mariogonzalezlaw.com)

McGuire Law Firm  
625 South 14th Street, Suite C  
Lincoln, Nebraska 68508  
Mark D. McGuire  
Counsel for Crow Butte Resources, Inc.  
E-mail: [mdmcguire46@gmail.com](mailto:mdmcguire46@gmail.com)

Tyson R. Smith, Esq.  
Counsel for Crow Butte Resources, Inc.  
E-mail: [trsmith@nuclear.law](mailto:trsmith@nuclear.law)

Counsel for Oglala Sioux Tribe  
David C. Frankel, Esq.  
770 L Street  
Suite 950  
Sacramento, CA 95814  
E-mail: [arm.legal@gmail.com](mailto:arm.legal@gmail.com)

Ved Nanda Center for International and  
Comparative Law  
1075 Waite Drive  
Boulder, CO 80303  
Andrew Reid, Esq.  
Counsel for Oglala Sioux Tribe  
E-mail: [lawyerreid@gmail.com](mailto:lawyerreid@gmail.com)

[Original signed by Clara Sola]  
Office of the Secretary of the Commission

Dated at Rockville, Maryland  
this 17<sup>th</sup> day of July, 2019