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OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

DIVISION OF FUEL CYCLE SAFETY, SAFEGUARDS, AND ENVIRONMENTAL REVIEW

FINAL ENVIRONMENTAL ASSESSMENT
AMENDMENT 8 TO
SOURCE AND BYPRODUCT MATERIALS LICENSE SUA-1601
REGARDING LICENSE CONDITION 11.3 (C)
STRATA ENERGY, INC. ROSS PROJECT
CROOK COUNTY, WYOMING

DOCKET NUMBER: 40-9091
LICENSE NUMBER: SUA-1601

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ABBREVIATIONS AND ACRONYMS

CFR	*Code of Federal Regulations*
CPP	central processing plant
DM	deep monitoring or underlying aquifer
EA	Environmental Assessment
FONSI	Finding of No Significant Impact
GEIS	Generic Environmental Impact Statement
ISR	in situ uranium recovery
LQD	Land Quality Division
MU	mine unit
NRC	Nuclear Regulatory Commission
NSR	non-significant revision
OZ	ore zone
SEIS	Supplemental Environmental Impact Statement
SER	Safety Evaluation Report
WDEQ	Wyoming Department of Environmental Quality

UNITS OF MEASURE

ac	acre
ft	feet
gpm	gallons per minute
ha	hectare
in	inch
km	kilometer
m	meter
mi	mile

1 INTRODUCTION

Strata Energy Inc. (Strata) submitted a request to amend the Source and Byproduct Materials License (SUA-1601) for its Ross uranium recovery (Ross) project to the U.S. Nuclear Regulatory Commission (NRC) for review and approval (Strata 2017a). Specifically, Strata is requesting that NRC approve a modification to License Condition 11.3 (C) for Mine Units Nos. 1 and 2 (MU1 and MU2) that would reduce the number of monitoring wells placed in the underlying (or deep monitoring [DM]) aquifer.

Strata initially submitted an application to the NRC to amend License Condition 11.3 (C) (Strata 2015a) in July 2015. The amendment application proposed procedures to establish whether future monitoring of the underlying aquifer (DM unit) was necessary at a specific well location. However, in March 2017, the NRC staff (2017d) informed Strata that the application was unacceptable as proposed, and Strata withdrew the application (2017b). Strata (2017a) submitted a second application to amend License Condition 11.3 (C), which is the subject of this review.

The Ross project is an in situ uranium recovery (ISR) facility located in Crook County, Wyoming near Oshoto, Wyoming. The Ross project was licensed by the NRC in 2014 (NRC 2014a) and the license has been amended seven times (NRC 2017a). The license was amended (Amendment No. 7) in July 2017 to modify License Condition 11.3 (A) and (B) related to the minimum density of baseline wells for a wellfield and the distance and spacing of perimeter wells for a wellfield. MU1 began operation in December 2015 (NRC 2015) and MU2 began in December 2016 (NRC 2017b). Strata's Ross project is planned to have a total of four mine units.

As part of its review of Strata's amendment request (Strata 2017a), the NRC staff has prepared this Environmental Assessment (EA). This EA includes an evaluation of the potential environmental impacts of the revision to License Condition 11.3 (C). In addition to an environmental review, the NRC staff is also conducting a detailed safety analysis of Strata's amendment request to determine whether the request meets the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40, "Domestic Licensing of Source Material." The NRC staff's safety analysis is documented in a separate Safety Evaluation Report (SER). The NRC decision whether or not to grant the license amendment will be based on the analyses documented in both the SER and this EA.

In addition to the NRC staff's review and approval of this amendment request, Strata also filed a similar request with the Wyoming Department of Environmental Quality's (WDEQ) Land Quality Division (LQD) for changes to its State Permit to Mine (No. 802). The conclusion of the WDEQ review is noted within this EA.

1.1 Site Location and Description

The Ross project encompasses approximately 696 ha [1,721 ac] in Crook County, Wyoming. See Figure 1. Nearby towns include Pine Haven, 27 km [17 mi] southeast; Moorcroft, 35 km [22 mi] south; Sundance, 50 km [30 mi] southeast; and Gillette, 53 km [33 mi] southwest. The Ross project is located on private and State lands adjacent to the unincorporated ranching community of Oshoto, Wyoming. There are no residences within the Ross project area. There are 11 residences within 3 km [2 mi] of the Ross project area; the closest residence is approximately 210 m [690 ft] north-northeast of the site boundary. The subsurface minerals are owned by the U.S. Government and the State of Wyoming. (NRC 2014b).

1.2 Uranium Recovery Process

At full development, the Ross project will consist of four mine units (wellfields), 15-25 wellfield modules (header houses), 1,400 to 2,200 recovery and injection wells, and 140-250 monitoring wells. Wellfields are areas over the ore zone(s) where the injection and recovery wells are located. Wellfield modules are groups of specific wells within a wellfield area, and are connected by piping to a module building or "header house." Each wellfield is surrounded by a perimeter ring of monitoring wells (NRC 2014b).

During the ISR process, an oxidant-charged solution, called lixiviant, is injected into an ore-zone aquifer (or uranium "ore body") through injection wells. Lixiviant uses native ground water (from the ore-zone aquifer itself), carbon dioxide, and sodium carbonate/bicarbonate, with an oxygen or hydrogen peroxide oxidant. As this solution circulates though the ore zone, the lixiviant oxidizes and dissolves the mineralized uranium, which is present in a reduced chemical state. The resulting uranium-rich solution, the "pregnant" lixiviant, is drawn to recovery wells by a pump, and then transferred to the central processing plant (CPP) via a network of buried pipes. At the CPP, the uranium is extracted from the solution using an ion-exchange process. The resulting "barren" solution (i.e., uranium-depleted) is then recharged with complexing and oxidizing agents before being re-injected to recover additional uranium from the particular wellfield (NRC 2014b). Currently Strata sends the uranium-laden resins offsite for processing into "yellowcake" at another licensed facility until the dryers are installed onsite at the Ross CPP in accordance with the license application.

During production, the uranium-recovery solutions continually move through the aquifer from outlying injection wells to internal recovery wells on a production unit basis. The production units are arranged in a variety of geometric patterns depending upon the ore-body's configuration, the aquifer's permeability, and the operator's operational experience. Wellfields are often designed with five-spot or seven-spot production unit patterns, with each recovery (i.e., production) well located inside a ring of four or six injection wells, respectively. A typical wellfield may have 60 production units that commonly share injection wells (NRC 2014b).

Monitoring wells are constructed in the ore body within the ore-zone aquifer to establish the wellfield baseline conditions prior to operations. Monitoring wells are also constructed around the ore body within the ore-zone aquifer, the overlying aquifer, and the underlying aquifer for the operational (i.e., excursion) monitoring program. These monitoring wells are screened in appropriate stratigraphic horizons to detect lixiviant, should it migrate out of the ore zone (i.e., production zone), or to establish the baseline water quality in the ore zone for restoration purposes after the operations are completed (NRC 2014b).

For a typical wellfield undergoing in situ uranium extraction, the NRC generally requires routine monitoring of the surrounding aquifers, including the first overlying and first underlying aquifers, to ensure fluids do not migrate away from the production area. By license condition, that requirement for Strata at its Ross ISR Facility includes monitoring groundwater in the first underlying aquifer at each wellfield using a specified well density of one well per four acres.

Once uranium recovery is completed and aquifer restoration has been performed, Strata will seek approval of the ground-water restoration from the NRC. The NRC's approval will be given when the ground-water quality at the point of compliance does not exceed the ground-water protection standards set forth in 10 CFR Part 40, Appendix A, Criterion 5B(5). Following NRC approval of the ground-water restoration, the facility and wellfields will be decontaminated and decommissioned in accordance with NRC-approved rules as well as in accordance with an NRC-approved decommissioning plan and/or restoration action plan. Once all of Strata's decommissioning efforts have been completed, the NRC will affirm the decommissioning, and the site can then be released for unrestricted public use (NRC 2014b).

1.3 Proposed Action

The Proposed Action is to amend License Condition 11.3 (C) of Strata's Ross license (SUA-1601) for MU1 and MU2 only, to reduce the number of monitoring wells in the designated underlying aquifer. For its NRC license, all monitoring wells for MU1 would be discontinued while Strata would continue to monitor eight monitoring wells in MU2.

1.4 Purpose of and Need for the Proposed Action

License Condition 11.3 (C) establishes that Strata must collect samples from all monitoring wells in the first overlying and first underlying aquifer at a minimum density of one well per 4 acres of wellfield. Strata, in its license amendment application, stated that the designated underlying aquifer wells do not meet the definition of an aquifer based on several parameters (e.g., poor water quality, low yield). During development of the first two mine units, Strata determined that routine monitoring of the low-yielding wells was burdensome and resulted in extreme efforts for sampling. Therefore, Strata submitted this application to amend its license to reduce that burden.

Eliminating monitoring of an underlying aquifer can be justifiable if the site conditions provide reasonable assurance that fluids will not migrate downward (vertically). The NRC has determined that the site conditions that would allow the elimination of monitoring is if the underlying confining unit has significant thickness and low permeability. In its safety analysis, the NRC staff will evaluate Strata's analysis of the site conditions for MU1 and MU2.

1.5 Scope of the Environmental Analyses

The environmental impacts of construction, operation, aquifer restoration, and decommissioning on water resources at the Ross project were previously evaluated by the NRC and documented in Section 4.5.1 of the Ross Supplemental Environmental Impact Statement (SEIS) (NRC 2014b). The Ross SEIS tiered from the Generic Environmental Impact Statement on In Situ Uranium Recovery (ISR GEIS, NUREG-1910) (NRC 2009). The EA for License Amendment No. 7 evaluated the impacts of modifications to License Condition 11.3 (A) and (B) (NRC 2017c). In that EA, the NRC staff determined that allowing a spacing of up to 500 feet between perimeter wells, provided that the maximum angle from the closest unit to the two nearest wells is less than 75 degrees, would ensure Strata is able to identify horizontal excursions in a timely manner. The NRC staff also determined that increasing the minimum density of wells to one well per four acres, with the stipulation that Strata would monitor all hydraulically-isolated areas, would ensure the necessary data is available to measure the effectiveness of future aquifer restoration activities. The NRC staff is incorporating by reference information and analyses presented in the Ross SEIS and the EA for License Amendment No. 7 as appropriate.

Strata's license amendment request provides stipulations and criteria to be used to determine when samples should be collected from the underlying aquifers. No additional land disturbance would occur as a result of this license amendment request. Therefore, the only potential impact to the environment would be on ground-water quality.

2 ALTERNATIVES TO THE PROPOSED ACTION

The alternatives considered in this EA are the Proposed Action and the No-Action Alternative. The No-Action alternative would mean the NRC did not approve Strata's license amendment request. As a result, Strata would continue operating the Ross project as currently licensed. The impacts of the No-Action Alternative have already been considered in Section 4.5.1 of the Ross SEIS and the NRC's EA for License Amendment No. 7 (NRC 2017c) and therefore will not be discussed further in this EA.

3 AFFECTED ENVIRONMENT

This section provides a brief description of ground water at the Ross project. A more detailed description of ground water can be found in Section 3.5.3 of the Ross SEIS (NRC 2014b) and in the Ross SER (NRC 2014c).

The proposed activities affect the ground-water quality in specific sandstones within the Fox Hills/Lance Aquifer. The Fox Hills/Lance aquifer is one of the regional aquifers found within the Powder River Basin of Wyoming (Rankl and Lowry 1990). The other regional aquifers include the Fort Union/Wasatch and Madison aquifers (Anna 1986, Feathers et al., 1981). In general, the potentiometric surface of the older (deeper) regional aquifers decreases in elevation (Downey 1986). However, each regional aquifer is typically defined by its own unique ground-water flow characteristics as each is separated from another by fine grained lithologies of substantial thickness.

The Ross area is located along the eastern margin of the Power River Basin (see Figure 3). The only regional aquifer found at depths less than 1000 ft below ground surface in this area is the Fox Hills/Lance Aquifer because the younger aquifers (e.g., Fort Union/Wasatch aquifer) have been eroded. The Pierre Shale effectively isolated the Fox Hills/Lance Aquifer from the deeper aquifers (Strata 2011).

Immediately east of the Ross area, the Fox Hills and Lance formations have been eroded, exposing the Pierre Shale at the ground surface. Consequently, the eastern extent of the Fox Hills/Lance Formation is defined by those outcrops. To the west, the depth to the base of the Fox Hills/Lance Aquifer increases due to the shallow westerly dip of the formations. In addition, the thickness of the aquifer increases in the western direction as the erosion of the Lance formation is less severe. In fact, the contact between the Lance Formation with the overlying Fort Union Formation is mapped approximately 2 miles west of the Ross area (Strata 2011).

The specific sandstones targeted for the ISR operations are found in a 200-ft interval within the lower Lance Formation and upper Fox Hills Formation. Strata has designated these sandstones as the Ore Zone (OZ) Aquifer (Strata 2011). The proposed amendment request does not change ISR operations within the OZ Aquifer.

At the Ross facility, Strata has designated the first “water-bearing” lithology below the proposed ore zone as the first underlying aquifer. This lithology, referred to as the DM unit, is a thin (thickness of approximately 20 feet) siltstone located stratigraphically within a mudstone, which is the confining unit. In its license application, Strata designated the DM unit as the underlying aquifer despite identifying the marginal ability of this lithology to transmit water to wells.

4 ENVIRONMENTAL IMPACTS

This section addresses the potential environmental effects to ground-water quality as a result of the changes to License Condition 11.3 (C). As discussed in Section 1.5 of this EA (Scope of Environmental Analysis), ground-water quality is the only resource that would be affected. There would be no new land use disturbance as a result of the license condition changes. The amendment request, if granted, would affect the monitoring program for the DM Unit at MU1 and MU2.

4.1 Impacts of Modifying License Condition 11.3 (C)

License Condition 11.3 requires Strata to install monitoring wells in the ore body around the perimeter of each wellfield and in the underlying and overlying aquifers. The monitoring well ring and wells in the overlying and underlying aquifers would be used to detect horizontal and vertical excursions of uranium-recovery solutions during ISR operations. During operations, Strata would sample groundwater from the monitoring wells and compare the analytical values to the NRC-specified standards to determine whether an excursion of any solution (such as lixiviant) into the surrounding aquifers has occurred (NRC 2014b).

License Condition 11.3 (C)

Overlying and Underlying Aquifers. Samples shall be collected from all monitoring wells in the first overlying and first underlying aquifer at a minimum density of one well per 4 acres of wellfield.

Strata is required, under License Condition 11.3 (C) to collect samples from the overlying and underlying aquifers at a minimum density. Strata requests that License Condition 11.3 (C) be revised to allow flexibility in determining the number of wells required for monitoring the underlying aquifer in MU 1 and MU2. The Proposed Action would amend the language of License Condition 11.3 (C) to read (changes underlined):

> *Overlying and Underlying Aquifers. Samples shall be collected from all monitoring wells in the first overlying and first underlying aquifer at a minimum density of one well per 4 acres of wellfield. Based on wellfield specific analyses, the minimum density requirement for the first underlying aquifer at Mine Units 1 and 2 is modified as follows:*
>
> > *Mine Unit 1: Monitoring at all wells is discontinued.*
> > *Mine Unit 2: Monitoring is required at wells MU2-DM01, MU2-DM05, MU2-DM06, MU2-DM08, MU2-DM09, MU2-DM15, MU2-DM22 and MU2-DM23.*

In December 2015, Strata submitted a request for a non-significant revision (NSR) to WDEQ for its Permit to Mine (No. 802) (Strata 2015b). Similar to its license amendment request to the NRC, Strata requested that its WDEQ Mine Plan be revised to allow flexibility in determining the number of DM monitoring wells based on site specific geologic and hydrogeologic evaluations. In December 2015, WDEQ approved the NSR with the stipulation of continued monitoring of the DM unit with a minimum of one well per 40 acres (WDEQ 2015). In October 2017, WDEQ issued a correction to Strata clarifying the approval did not allow Strata to monitor less than one monitoring well per four acres in the DM zone (WDEC 2017).

In June 2017, the NRC staff requested additional information (RAIs) from Strata focusing on Strata's rationale and justification for data used in its analysis and clarification of methodology (NRC 2017e). Strata submitted responses to the RAIs and also revised their initial amendment request, including limiting the revisions to License Condition 11.3 (C) to only MU1 and MU2 and providing criteria for analysis (Strata 2017c).

The NRC conducted a detailed technical analysis of Strata's license amendment request (NRC 2017f). In its request, Strata provided multiple criteria to determine if a well in the underlying aquifer should be monitored (Strata 2017a, c). Based on its review, the NRC concluded that a reduction in the number of monitoring wells was appropriate. A summary of the NRC's safety analysis of Strata's acceptable criteria is provided below. Although the NRC concluded that three of Strata's criteria were unacceptable, those criteria do not affect the environmental analysis since they were not ultimately used to determine whether or not a well should be sampled.

The long-standing practice of the NRC staff is to accept 50 feet of low permeable material in applying the Standard Review Plan Acceptance Criterion 5.7.8.3(3)(iii) (NRC 2003). The NRC's practice assumes that migration through the lower confining unit is limited thus not requiring monitoring of the underlying aquifer because the vertical hydraulic conductivity of the confining aquifer is extremely low and limited preferential pathways (e.g., drillholes) exist. This means the potential for vertical migration of an unintended release through the transmissive layer is highly unlikely (NRC 2017f). The NRC agreed that low vertical hydraulic conductivity values are expected in the lower confining unit and thus the potential for vertical migration is unlikely.

Another consideration in the NRC staff's review is based on the State of Wyoming's definition of an aquifer (WDEQ 2013). Wyoming's definition of an aquifer is one which transmits water in sufficient quantities for a specific use. The definition further defines sufficient quantities as 0.5 gallons per minute (gpm) sustained over a 24-hour period. After its technical review, the NRC determined that all of the monitoring wells at MU1 and many of the MU2 wells had yields less than 0.5 gpm, and thus monitoring was not necessary. However, the yields for eight wells in MU2 could not be verified and therefore, the NRC will require those wells to continue to be monitored (NRC 2017f).

The NRC considered the degree to which re-abandonment of historic drillholes occurs affects the probability of an unwanted release. There was only one drillhole not re-abandoned within the patterned areas for MU1 and MU2 and thus the likelihood of an excursion through that single well is low. There were five drillholes located between the production area and the perimeter well ring, but there are no excursion monitoring wells completed in the underlying aquifer. The NRC's safety review concluded that the elimination of monitoring wells would not increase the probability of an unwanted release. Therefore, the degree of re-abandonment at MU1 and MU2 does not pose a significant risk to the environment.

The NRC's safety analysis also considered the induced drawdown from sampling of the DM wells, which slightly increased (less than one inch) the depth of penetration of fluids in the production zone into the top of the confining unit. This increase of less than one inch would not be detected by the monitoring program, however, it could add additional time to restoration. Therefore, the NRC found that eliminating the wells with low transmissivities and thus greater drawdowns, could decrease restoration times.

The NRC staff concluded in its safety analysis that: the lack of historical drillholes resulting from successful re-abandonment efforts in MU1 and MU2; a significant thickness of low permeable material within the lower confining unit; long migration times within the DM unit; and removal of induced drawdown would not lessen the protection of human health and the environment if the monitoring wells in MU1 and MU2, with yields less than 0.5 gpm, were eliminated (NRC 2017f).

As a result of this license condition change, Strata would only need to continue monitoring at eight monitoring wells in the underlying aquifer (DM unit) at MU2. No monitoring wells would be monitored at MU1 to fulfil its NRC license. However, Strata would need to monitor at least one well in MU1 to fulfill its Wyoming Permit to Mine requirements (a minimum of one well per 4 acres in the DM zone). The NRC staff determined that the eight monitoring wells would maintain Strata's ability to identify vertical excursions into the underlying aquifer at MU2 where the DM unit has a potential to transmit water. Therefore, the amendment to License Condition 11.3 (C) would not result in any significant impact to ground-water quality.

4.2 Cumulative Impacts

This section evaluates the cumulative effects that result from the incremental impact of the Proposed Action on the environment, when added to other past, present, and reasonably foreseeable future actions.

The NRC prepared a cumulative impacts analysis in the Ross SEIS. The NRC incorporates by reference the cumulative impacts analysis of ground-water quality provided in Section 5.7.2 of the Ross SEIS (NRC 2014b). The cumulative impact assessment considered the event where metals migrated downgradient, outside of the ore zone, and the NRC determined the impacts were SMALL. The conclusion was based on the chemistry of the aquifer and the conclusion that the metals would precipitate out in the oxygen-deficient environment onto the aquifer rock walls.

Since the publication of the Ross SEIS, Strata has submitted several license amendment requests. The amendments to the license since publication of the Ross SEIS include Amendment No. 1 (incorporating the Atomic Safety and Licensing Board ruling in the initial licensing proceeding into License Condition 10.12), Amendment No. 2 (revising the baseline list of constituents), Amendment No. 3 (2015 Surety update), Amendment No. 4 (removal of License Condition 12.8), Amendment No. 5 (2016 surety update), Amendment No. 6 (revising

the Designee duties), and Amendment No. 7 (NRC 2017a). The first six amendments met the criteria for a categorical exclusion under 10 CFR 51.22 and thus do not individually or cumulatively have a significant effect on the human environment. The EA for License Amendment No. 7 evaluated the impacts to ground-water quality as a result of the change in monitoring requirements for the ore zone aquifer. The OZ aquifer is hydraulically distinct from the underlying aquifer (which is the subject of this EA) therefore, changes in monitoring of the OZ aquifer would have a negligible cumulative impact when added to the reduction of the monitoring of the underlying aquifer.

Another Strata request was to expand the Ross project to include the Kendrick project area (Strata 2015c). However, in December 2016, Strata requested that the NRC suspend its review until the market conditions for uranium improved (Strata 2016). The Ross SEIS's analysis of cumulative impacts considered the expansion of the Ross site, including the proposed Kendrick area.

Chapter 6 of the Ross SEIS describes the environmental monitoring and reporting that would be required of Strata pursuant to conditions of its NRC license, other permits (e.g., WDEQ Permit to Mine), and other applicable environmental regulations (NRC 2014b). Strata would still be responsible for maintaining any related permits and licenses.

Although Strata would only have to monitor eight wells in MU2, Strata would still be able to identify vertical excursions into the underlying aquifer a timely manner in the areas where the DM unit has higher transmissivities. Furthermore, the Proposed Action eliminates sampling of those monitoring wells with a higher induced drawdown which potentially could hamper future restoration efforts in the ore zone, after completion of the ISR operations. The incremental impact to ground-water quality from the revision to License Condition 11.3 (C) as a result of this license amendment request would not change the NRC's assessment of cumulative impacts to groundwater quality in the Ross SEIS, determined to be SMALL, which remains bounding for this assessment.

5 CONSULTATIONS AND PERSONS CONTACTED

On December 01, 2017, the NRC staff provided a copy of the draft EA to the WDEQ/LQD for review and comment (NRC 2017g). WDEQ responded on January 02, 2018 with no comments on the Draft EA (WDEQ 2018).

The NRC staff has determined that the Proposed Action would not result in any additional land disturbance or authorize any additional activities than those already assessed in the Ross SEIS. Therefore, no additional consultation is required under either Section 106 of the National Historic Preservation Act or Section 7 of the Endangered Species Act.

6 RECOMMENDATION AND CONCLUSION

The NRC evaluated the potential impacts to ground-water quality from the Proposed Action and determined that the changes would maintain Strata's ability to identify vertical exclusions, although it could potentially increase the time for restoration. Therefore, the NRC staff concludes that preparation of an Environmental Impact Statement is not warranted. Accordingly, the NRC staff has determined that a Finding of No Significant Impact (FONSI) is appropriate. The FONSI will be issued in a *Federal Register* after the final EA is published.

7 LIST OF PREPARERS

Donald Lowman, Project Manager, Office of Nuclear Material Safety and Safeguards - licensing

Jessie Muir Quintero, Project Manager, Office of Nuclear Material Safety and Safeguards - environmental

John Saxton, Hydrogeologist, Office of Nuclear Material Safety and Safeguards - ground water

8 REFERENCES

10 CFR Part 40. *Code of Federal Regulations,* Title 10, Energy, Part 40, "Domestic Licensing of Source Material." Washington, DC.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, Energy, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Functions." Washington, D.C.

Anna, L. O. 1986. "Geologic Framework of the Ground-Water System in Jurassic and Cretaceous Rocks in the Northern Great Plains, in parts of Montana, North Dakota, South Dakota, and Wyoming", U.S. Geological Survey, Professional Paper, 1402-B, 1986.

Downey, J. S. 1986. "Geohydrology of Bedrock Aquifers in the Northern Great Plains in Parts of Montana, North Dakota, South Dakota, and Wyoming", U.S. Geological Survey, Professional Paper 1402-E, 1986.

Endangered Species Act, as amended. 16 U.S.C. §1531 *et seq*.

Feathers, K. R., R. Libra and T. R. Stephensen. 1981. "Occurrence and Characteristics of Ground Water in the Powder River Basin, Wyoming", University of Wyoming, Water Resources Research Institute, Volume I-A, June 1981.

National Historic Preservation Act. 54 U.S.C. 300101 *et seq.*

NRC. 2003. NUREG-1569. Standard Review Plan for In Situ Leach Uranium Extraction License Applications. Washington, DC. June 2003. ADAMS Accession No. ML

NRC. 2009. NUREG-1910. "Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities." Washington, DC. May 2009. ADAMS ML15093A368.

NRC. 2014a. Materials License SUA-1601 for Ross ISR Project in Crook County, Wyoming. Washington, DC. April 24, 2014. ADAMS ML14069A335.

NRC. 2014b. NUREG-1910, Supplement 5. "Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming." Washington, DC. February 2014. ADAMS ML14056A096.

NRC. 2014c. Safety Evaluation Report for the Strata Energy, Inc. Ross ISR Project, Crook County, Wyoming: Materials License SUA-1601. January 2014. ADAMS ML14108A088.

NRC. 2015. Strata Authorization Letter to Operate. Dated November 30, 2015. ADAMS ML15334A308.

NRC. 2017a. Materials License SUA-1601 for Ross ISR Project in Crook County, Wyoming. Amendment 7. Washington, DC. July 19, 2017. ADAMS ML17011A167.

NRC. 2017b. NRC Inspection Report 040-09091/2017-002 and Notice of Violation. March 6, 2017. ADAMS ML17054D527.

NRC. 2017c. Final Environmental Assessment for Strata Ross License Amendment Number 7. July 12, 2017. ADAMS ML17191A371.

NRC. 2017d. Email with Proposed License Conditions 11.3(A) and (B). March 9, 2017. ADAMS ML17079A289.

NRC. 2017e. Letter to Strata Energy, Inc., regarding a request for additional information on the application to amend License Condition 11.3C. June 15, 2017. ADAMS ML17164A135.

NRC. 2017f. Safety Evaluation Report Review of Application to Amend License Condition 11.3(C), License SUA-1601, Strata Energy, Inc. Ross In Situ Recovery Facility, Crook County, WY. October 1, 2017. ADAMS ML17284A159.

NRC. 2017g. Email to WDEQ, from NRC, transmitting Draft Environmental Assessment for Review and Comment. December 01, 2017. ADAMS ML17335A567.

Rankl, J. G. and M. E. Lowry. 1990. "Ground-Water-Flow Systems in the Powder River Structural Basin, Wyoming and Montana", U.S. Geological Survey, Water-Resources Investigations Report, 85-4229, 1990.

Strata. 2011. Ross ISR Project USNRC License Application, Crook County, Wyoming, prepared by Strata Energy, Inc., Docket No. 040-09091. January 2011. ADAMS ML110120063.

Strata. 2015a. Strata Energy, Inc. Request to Amend License Condition 11.3: License SUA-1601. July 26, 2015. ADAMS ML15205A337.

Strata. 2015b. Letter to WDEQ, dated August 21, 2015, regarding Strata Energy Ross In Situ Recovery Project LQD Permit to Mine No. 802 Non Significant Revision to the Permit. ADAMS ML17019A213.

Strata. 2015c. Kendrick Expansion Area Amendment to License SUA-1601, Docket #40-901. March 20, 2015. ADAMS ML15096A141.

Strata. 2016. Letter from Strata to NRC, requesting suspension of Kendrick Expansion Area Amendment Application. December 21, 2016. ADAMS ML15096A142.

Strata. 2017a. Letter from Strata to NRC, requesting resumption of the amendment application for revising License Condition 11.3C. April 5, 2017. ADAMS ML17103A262.

Strata. 2017b. Strata Energy, Inc. Email Response to Staff's Proposed license condition for 11.3 A & B. March 29, 2017. ADAMS ML17089A275.

Strata. 2017c. Strata Energy, Inc. Response to the Request for Additional Information for the Requested Licensing Action to Amend Source Materials License SUA-1601 License Condition 11.3 (C). August 11, 2017. ADAMS ML17229B436.

WDEQ. 2013. Guideline No. 4 In Situ Mining Noncoal. Department of Environmental Quality Land Quality Division. Revision Date: October 28, 2013. Available at: http://deq.wyoming.gov/media/attachments/Land%20Quality/Guidelines/Guidelines-04_insitu-mining-noncoal-guide-4.pdf.

WDEQ. 2015. Letter from WDEQ to Strata, dated December 10, 2015, regarding Approval of Non-Significant Revision Application, Strata Energy Ross Project, Permit No. 802, TFN 6 2/170, Change No. 7. ADAMS ML17019A213.

WDEQ. 2017. Letter from WDEQ to Strata, dated October 31, 2017, regarding "Correction to Approval of Non-Significant Revision Application, Strata Energy Ross Project, Permit No. 802, TFN 6 2/170, Change No. 7." ADAMS ML17332A095.

WDEQ. 2018. Email from Julie Powell, WYDEQ, regarding "Strata Energy Draft EA." January 03, 2018. ADAMS Accession No. ML17360A222.