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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Deputy Director, Division of Decommissioning, Uranium Recovery and Waste Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T-8F5, 11545 Rockville Pike
Rockville, MD 20852-2738

**RE: Strata Energy Inc. Ross ISR Project
Source Materials License SUA-1601, Docket No. 40-9091
Revised Pages for the July - December 2016 Semi-Annual Effluent Report**

To Whom it May Concern:

Strata Energy, Inc. (Strata) hereby submits revised pages for the Semi-Annual Report for the period of July 1, 2016 through December 31, 2016. As noted in our original submittal, the results of the effluent air particulate and a summary of the results would be provided under a separate cover. The enclosed pages are those that have been updated with the effluent air particulate results.

If you have any questions regarding the provided information, please contact me at (307) 467-5995 or by email at mgriffin@stratawyo.com.

Sincerely,
STRATA ENERGY INC.

A handwritten signature in black ink, appearing to read "M. Griffin", is written over a faint, illegible stamp or watermark.

Michael Griffin
Vice President of Permitting, Regulatory and Environmental Compliance

cc: Ben Schiffer, WWC Engineering

Attachments: Revised Pages for the July - December 2016 Semi-Annual Report

IE48
NMSSD1

radionuclides of concern, namely U-Nat, Th-230, Ra-226, and Pb-210. The three locations are the Ion Exchange Area, the Reverse Osmosis Area, and the Laboratory. The reported concentrations are averaged across the three locations and then multiplied by the air ventilation rate of the processing facility and the length of time in the reporting period to determine the total quantity of effluent released in the form of air particulates from the processing facility.

The results are displayed in Appendix A, Table 11 and show that all of the results were non-detect for the third and fourth quarters. Beginning in the third quarter the contract laboratory changed the reporting limits based on the 10 CFR Part 20 Occupational Limits. The Ra-226, Th-230, and U-nat reporting limit changed from 1E-16 $\mu\text{Ci}/\text{mL}$ to 1E-12 $\mu\text{Ci}/\text{mL}$ and the Pb-210 reporting limit changed from 2E-15 $\mu\text{Ci}/\text{mL}$ to 2E-12 $\mu\text{Ci}/\text{mL}$.

6.1.2 Wellfield

Wellheads are not considered sources of air particulates and Strata's deep disposal well building only contains a sealed wellhead and no ventilation system. Although it is very unlikely that air particulates will be generated at header houses since all fluids are within pressurized piping, it has been assumed that header houses could be a diffuse source of air particulates at the Ross Project. Therefore, monthly air particulate samples are obtained from each header house and submitted as a composite sample to an outside accredited laboratory. The composite samples are submitted semi-annually and analyzed for U-Nat, Ra-226, Th-230, and Pb-210. The results are averaged to determine the average concentration of air particulates in the header houses. This average concentration is then multiplied by the design ventilation rate of the two ventilation fans in each header house, the time of the reporting period, and the number of header houses to determine the total quantity of effluent released in the form of air particulates due to operations in the wellfield.

Each ventilation fan in the header houses is rated at 167 CFM (4.7E6 mL/minute). There are two ventilation fans in each header house. The results are displayed in Appendix A, Table 12 and show that all of the results were non-detect for the time period. Beginning in the third quarter the contract laboratory changed the reporting limits based on the 10 CFR Part 20 Occupational Limits. The Ra-226, Th-230, and U-nat reporting limit changed from 1E-16 $\mu\text{Ci}/\text{mL}$ to 1E-12 $\mu\text{Ci}/\text{mL}$ and the Pb-210 reporting limit changed from 2E-15 $\mu\text{Ci}/\text{mL}$ to 2E-12 $\mu\text{Ci}/\text{mL}$.

6.2 EFFLUENTS DUE TO RADON AND RADON PROGENY

The term radon progeny refers to the long lived decay products of Rn-222. Strata will assume equilibrium between radon and radon progeny.

6.2.1 Plant

To determine the quantity of effluent released from the plant as radon and radon progeny, Strata has committed to obtaining periodic samples of process fluid and analyzing the solution for the quantity of Rn-222. Samples are obtained from the recovery and injection solutions and sent to an outside accredited laboratory for analysis of the concentration of Rn-222. The concentration of Rn-222 is multiplied by the average process fluid flow for the time period to determine the quantity per unit time of Rn-222 which was in the processing facility on the recovery side and the quantity per unit time on the injection side. The quantity per unit time of Rn-222 from the injection portion is subtracted from the quantity per unit time

6.2.3 *Unplanned Releases*

Two unplanned reportable releases of process fluid occurred at the Ross Project during the reporting period. A reportable release occurred on July 19, 2016 (reported to NRC staff on July 20, 2016 NRC Accession No. ML16204A006) with an estimated 1,620 gallons of fluid being released. The fluid was from Pond 1 Cell 3 which is comprised mainly of injection solution. The other reportable release occurred on October 11, 2016 (reported to NRC staff on October 12, 2016 NRC Accession No. ML16319A255) with an estimated 1,000 gallons of injection fluid being released. A summary of the estimated quantity of fluid released, the injection Rn-222 concentration found for that month, and the calculated Rn-222 released from the event is provided in Appendix A, Table 16. The conversion factor of 1 gallon = 3,785 milliliters was used.

6.3 BACKGROUND

The background concentration levels for radon and air particulates are the radon and air particulate concentration levels measured at the environmental monitoring station designated as the background location (the "Southwest" site).

6.3.1 *Radon and Radon Progeny*

As reported in Appendix A, Table 3, the value obtained from the background location is an average radon concentration of $6.8E-10$ $\mu\text{Ci/mL}$. This background value was not subtracted from the concentrations of effluent found in the processing facility as the concentrations obtained were from the process fluid, not the surrounding atmosphere. The method determines the effluent released by measuring a difference in concentrations in the process fluid and then assuming that difference is exhausted, thus a consideration of background would not be appropriate. A consideration of background in regards to unplanned releases is also not appropriate since the release is calculated based off of the concentration of Rn-222 in the process fluid released and not on the concentration of Rn-222 in the surrounding atmosphere. The background concentration was subtracted in regards to effluents in the wellfield as displayed by the net average concentration in Appendix A, Table 15.

6.3.2 *Air Particulates*

Background values for air particulates are reported in Appendix A, Table 1. These values were not subtracted from the processing facility results since all of the results were non-detect for the third and fourth quarters (Appendix A, Table 11).

6.4 TOTAL QUANTITIES RELEASED

The three sources of effluent at the Ross Project have been identified as the processing facility, the wellfield, and any unplanned releases of process fluids. The deep disposal well building is not currently considered a source of effluent as the building only contains a sealed wellhead. All pumps associated with the system are contained in the processing facility. Additionally, the deep disposal well building does not contain a ventilation system.

6.4.1 Quantity of Air Particulate Effluent

The quantity of effluent released in the form of air particulates typically summarized in Appendix A, Table 17. Due to the change in the contract laboratory reporting limit, described in Sections 6.1.1 and 6.1.2, all of the results were non-detect and therefore the total air particulate effluent was negligible.

6.4.2 Quantity of Radon and Radon Progeny Effluent

The Rn-222 effluent released from the plant is calculated as 7.7 Ci. The Rn-222 effluent released from the wellfields is calculated as 9.1E-02 Ci. The effluent released from unplanned releases is calculated as 1.1E-05 Ci. The summation of the three sources of effluent yields a total quantity of Rn-222 effluent released of 7.7 Ci.

6.4.3 Conclusion

As stated in 10 CFR § 40.65: "If quantities of radioactive materials released during the reporting period are significantly above the licensee's design objective previously reviewed as part of the licensing action, the report shall cover this specifically." Strata previously estimated the quantity of effluent released in its TR Section 7.3. Strata stated: "The Ross ISR project has the potential to produce radiological effluent in the form of Rn-222 that is dissolved in the production and restoration fluid and is present as a result of the uranium decay series. It is assumed there will be no particulate emissions during routine operations of this facility as the facility will use modern, low temperature vacuum driers, the particulate release of which is considered to be zero by the NRC as provided in NUREG 1910."

The lack of effluent in the form of particulates is demonstrated by the non-detect concentrations reported.

In regards to the quantity of effluent from Rn-222, the TR Section 7.3.4.4 estimated the following: 122 Ci/yr from recovery wells in Mine Unit 1 and 71.2 Ci/yr from operations in the plant. The quantities of effluent found during this reporting period are below what was estimated in the license application review process.

7 LICENSE CONDITION 11.1(E) AND (F) AND 11.2 - ANNUAL REPORT

The annual report requirement for these license conditions covering the submittal of SERP reviews and changes and inventory of water supply wells and land use survey within 2 km of a production area and the results of the annual ALARA audit and an analysis of the dose to the public will be submitted within 90 days following the completion of the reporting period (December 31, 2016).

Table 11 - Processing Facility Air Particulate Effluent Results, 3Q and 4Q 2016

Sample Period	Radio-nuclide	Concentration (μCi/mL)	Error ±(μCi/mL)	Concentration (μCi/mL)	Error ±(μCi/mL)	Concentration (μCi/mL)	Error ±(μCi/mL)	Average Conc. (μCi/mL)	Net Average Conc. (μCi/mL)	Effluent Released (Ci)
		Ion Exchange Area		Reverse Osmosis Area		Lab				
3 rd Quarter	U-Nat	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Th-230	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
4 th Quarter	U-Nat	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Th-230	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Ra-226	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A
	Pb-210	ND	N/A	ND	N/A	ND	N/A	ND	N/A	N/A

N/A = Not Applicable; ND = Non-Detect

Table 12 - Wellfield Air Particulate Effluent Results, Composite 3Q and 4Q 2016

Location	Sample Period	Radionuclide	Concentration ($\mu\text{Ci/mL}$)	Error $\pm(\mu\text{Ci/mL})$	Net Concentration ($\mu\text{Ci/mL}$)	Effluent Released (Ci)
Header house 1	Aug. '15 – Jan '16	U-Nat	ND	N/A	N/A	N/A
		Th-230	ND	N/A	N/A	N/A
		Ra-226	ND	N/A	N/A	N/A
		Pb-210	ND	N/A	N/A	N/A
Header house 2	Aug. '15 – Jan '16	U-Nat	ND	N/A	N/A	N/A
		Th-230	ND	N/A	N/A	N/A
		Ra-226	ND	N/A	N/A	N/A
		Pb-210	ND	N/A	N/A	N/A
Header house 3	Aug. '15 – Jan '16	U-Nat	ND	N/A	N/A	N/A
		Th-230	ND	N/A	N/A	N/A
		Ra-226	ND	N/A	N/A	N/A
		Pb-210	ND	N/A	N/A	N/A
Header house 4	Aug. '15 – Jan '16	U-Nat	ND	N/A	N/A	N/A
		Th-230	ND	N/A	N/A	N/A
		Ra-226	ND	N/A	N/A	N/A
		Pb-210	ND	N/A	N/A	N/A

N/A = Not Applicable, ND = Non-Detect

Table 17 – Total Air Particulate Effluent, 3Q and 4Q 2016

Radionuclide	Plant Effluent (Ci)	Wellfield Effluent (Ci)	Total Effluent (Ci)
U-Nat	N/A	N/A	N/A
Th-230	N/A	N/A	N/A
Ra-226	N/A	N/A	N/A
Pb-210	N/A	N/A	N/A
			N/A

N/A = Not Applicable