



October 23, 2015

U.S. Nuclear Regulatory Commission  
Nuclear Material Safety and Safeguards  
Division of Decommissioning, Uranium Recovery, and Waste Programs  
Uranium Recovery Licensing Branch  
Attention: Mr. John Saxton, Project Manager  
Two White Flint North, Mail Stop T8 F5  
11545 Rockville Pike  
Rockville, MD 20852

Re: Strata Energy Ross In Situ Recovery Project  
Source Materials License SUA-1601, Docket No. 040-09091  
Additional Clarifications Regarding License Condition 12.7 A) and 12.7 B)

To Whom It May Concern:

By letter dated July 30, 2015 (ADAMS Accession No. ML15224B400), Strata Energy, Inc. (Strata) submitted to the Nuclear Regulatory Commission (NRC) a response to comments and a request for additional information made by the NRC (ADAMS Accession No. ML15190A156) in regards to Strata's Source Material License SUA-1601 License Condition (LC) 12.7. By letter dated October 15, 2015, the NRC requested clarification on several items which were discussed in the July, 30, 2015 submittal. Strata submitted the requested information by letter dated October 21, 2015. Due to clarifications made in a Project Manager to Project Manager phone call which occurred on October 22, 2015, Strata is submitting revised responses to the requested clarifications made by the NRC in the October 15, 2015 letter. The revised responses to the October 15, 2015 letter are included in this submittal as Attachment 1. The corresponding revised effluent monitoring commitments are included as Attachment 2.

Please contact me if you have any questions. You can reach me at (307) 686-4066 or [mgriffin@stratawyo.com](mailto:mgriffin@stratawyo.com).

Sincerely,

Strata Energy, Inc.

A handwritten signature in black ink, appearing to read "Michael Griffin".

Michael Griffin

Vice President of Permitting, Regulatory and Environmental Compliance

*Nikolas Roche (Strata RSO)  
for Mike Griffin*

Cc: Mr. David Brown, NRC Sr. Health Physicist – via email

# Attachment 1

## ROSS URANIUM PROJECT SUA-1601 SOURCE MATERIALS LICENSE

### Clarifications on Proposed Effluent Monitoring Plan

#### Clarifications Regarding License Condition 12.7 (A):

##### *Clarification No. 1:*

Strata commits to using the measured air particulate concentration in conjunction with the central processing plant's (CPP) air ventilation rate to estimate the effluent quantities of particulate matter from the CPP. Specifically, Strata will calculate the average air concentration of particulate matter for the reporting period from data obtained in accordance with the air particulate monitoring plan outlined in Strata's Technical Report (TR). Average air concentrations of U-nat, Th-230, Ra-226, and Pb-210 will be based on quarterly composites of periodic air samples.

The average air concentration of particulate matter will be multiplied by the average air ventilation rate of the CPP to yield the average effluent release for particulate matter per unit time. Multiplication of the average effluent release for particulate matter per unit time with the total time of the reporting period will yield the estimated total effluent quantity of particulate matter released from the CPP for the reporting period.

During the summer months it is common industry practice to open the bay doors for a cooling effect. The NRC requested that Strata provide an analysis of the ventilation during this time to account for any effluent emissions due to the open bay doors. In the TR, Strata committed to providing six air exchanges per hour in the main processing facility. To accomplish this, there are two main exhaust fans at the CPP. Each of the exhaust fans are rated for 20,000CFM (cubic feet per minute). If the two 20,000CFM fans run full time for 60 minutes, the total air ventilation is 2,400,000 cubic feet per hour. This flow is what is anticipated during a non-restricted air flow situation, such as when all the overhead doors are open. This flow rate cannot be achieved in the colder months when the doors are closed, therefore Strata also has heated, forced air inlets rated to the same inlet flow rate as the exhaust fans. Due to the high ventilation rate of the CPP, Strata has reasonable assurance that any particulate matter effluent will be emitted through the ventilation system and not through any passive ventilation. Therefore using only the ventilation rate of the ventilation system will be conservative in estimating particulate matter effluent.

The NRC also requested that Strata provide clarification on the ventilation rate that would be applied when active ventilation is not used. Strata anticipates that active ventilation will be used at all times and will only not be used during non-routine periods such as during maintenance work on the ventilation system or during power outages. Thus Strata commits to assuming that the active ventilation is operating at all times during the calculation of effluent release. This assumption is conservative as the ventilation rate of active ventilation is much greater than the passive ventilation rate and thus will result in a larger estimated effluent release.

*Clarification No. 2:*

Strata commits to using passive track-etch devices to estimate the quantity of radon gas in air effluent. Passive track-etch devices will be placed inside the DDW building, the headerhouses, and in 10% of the production wells. The devices will be exchanged quarterly and submitted to a NVLAP accredited laboratory.

Strata previously proposed a methodology for estimating the release of radon progeny in air effluent from these locations in its' July 30, 2015 letter. The same methodology will be used for radon gas, i.e. multiplication of the average concentration by the ventilation rate. As the ventilation rate from production pumps is not known, Strata will assume a flow rate of 2LPM as described in the July 30, 2015 submittal. The average concentration will be calculated as described in the July 30, 2015 submittal. As Strata is hereby committing to measure the concentration of radon gas, Strata will estimate the radon progeny concentrations from radon gas measurements by assuming 100% equilibrium. Thus the previous commitment of grab air samples in these locations to measure radon progeny concentrations is no longer valid.

*Clarification No. 3:*

When estimating the quantity of radon progeny in air effluent, Strata commits to assuming that the radon progeny concentration is in 100% equilibrium with the radon concentration

**Clarification Regarding License Condition 12.7 (B):**

Strata commits to using measured source terms, determined in accordance with the effluent monitoring plan, with MILDOS-AREA to estimate downwind concentrations at the boundary of the unrestricted area.

## Attachment 2

### ROSS URANIUM PROJECT SUA-1601 SOURCE MATERIALS LICENSE

#### Revised Effluent Monitoring Commitments

*Note: Changes to the original submittal are in bold type*

Strata has identified three main sources of effluent from areas outside the Central Processing Plant (CPP). These sources are the header houses, the deep disposal well building, and the production wells in the wellfield. An additional source of effluent would be the potential unplanned release of process fluid in the wellfield.

#### *Radon and Radon Progeny Emissions*

In order to account for the quantity of radon and radon progeny from these sources, Strata will conduct surveys of radon concentration in the header houses, deep disposal well building, and at specified wells in the wellfield. Strata will **utilize passive track-etch devices** to conduct the surveys for radon. **The devices will be exchanged quarterly and sent to a NVLAP accredited laboratory for analysis. Strata will assume that the radon progeny concentration is in 100% equilibrium with the radon concentration.**

In regards to the wells, the injection wells have sealed well heads and thus the potential of radon release from the injection wells is minimal. There is the potential for radon release from the production wells, however. Thus Strata will survey 10% of the production wells. This method of quarterly representative sampling of production wells has been previously approved for other operators by the NRC as an acceptable method for accounting for radon from well heads.

The concentrations of radon and radon progeny in the air from the surveys conducted in the various header houses will be averaged to obtain an average concentration of radon and radon progeny for the header houses for that **quarter**. This average concentration will be multiplied by the design flow rate of the exhaust fans to be used in the header houses to determine the potential activity of radon and radon progeny being discharged from a header house. The number of header houses in operation will then be multiplied by the average emission such that the total emissions of radon and radon progeny from all operating header houses can be estimated. The addition of new header houses will be included in this estimate, using the amount of time that the header house was in operation. For example, if a newly added header house was in operation for only the last month of the time period, then the emissions for only that month will be estimated and added to the total release from all header houses.

The same procedure as used for the header houses will be used for potential radon and radon progeny emissions from the deep disposal well building. **A passive track-etch device** will be used to obtain a concentration level in the building, and this will be multiplied by the design flow rate of the ventilation.

As discussed above, **passive track-etch devices will be placed in 10%** of the production wells. Due to the high variability in the emissions rate from the wellhead, it will be assumed that the wellhead is emitting air at a rate of 2 LPM, the rate that an air sampler **for radon progeny** would pull a sample. This assumption will be a gross overestimation, but will be utilized until and unless proof of the actual

emissions rate can be determined. Consistent with the method for estimating emissions from the header houses, the quarterly data obtained from sampling will be averaged so that an average concentration of radon and radon progeny emitted from each wellhead can be estimated. These average concentrations of radon and radon progeny will be multiplied by the estimated ventilation rate and the number of production wells to estimate the total emission of radon and radon progeny from the wells.

In the event of an unplanned release of process fluid in the wellfield, Strata will estimate the total volume of solution released using monitoring data (e.g., flow rate of a specific well that is the source of the spill). This volume data will then be used with the most recent radon sampling data for the relevant process solution to determine the total quantity of radon and radon progeny released.

#### *Particulate Emissions*

In order to account for the quantity of radioactive particulates emitted from sources other than the CPP, Strata will conduct surveys of particulate concentrations in the header houses and the deep disposal well building. Strata will utilize air sampling techniques outlined in the TR Section 5.7.3.1 for air particulate sampling. The surveys will be conducted at least monthly in the header houses and deep disposal well building. The samples obtained will be measured for gross alpha concentration. Radiological characterization of the samples will also be performed semi-annually. The samples will be sent to an outside accredited laboratory and analyzed for the composition of U-Nat, Th-230, Ra-226, Po-210, and Pb-210. The effluent attributed to each radionuclide **of concern** will be calculated using the method discussed above for radon and radon progeny emissions from the header houses and deep disposal well building, namely the multiplication of the averaged concentrations by the ventilation rate.

In the event of an unplanned release of process fluid in the wellfield, Strata will use the concentrations obtained from the most recent analysis of the relevant process fluids regarding isotopic composition. These concentrations will be multiplied by the volume of process fluid released to estimate particulate effluent from this source.

The surveys described above will be conducted according to approved procedures and in accordance with Strata's Quality Assurance Program. Proper documentation will be made of all surveys and the results will be provided in applicable reports.

**As discussed in the July 30, 2015 submittal, the background concentration levels for radon will be the radon concentration levels measured at the environmental monitoring station designated as the background location. Additionally, the background air particulate concentrations will be the particulate concentrations measured at the environmental monitoring station designated as the background location.**