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August 26, 2016

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**NRC License SUA-1548, Docket No. 40-8964, Semi-Annual Effluent and Environmental Monitoring Report, January 1 through June 30, 2016**

Document Control Desk:

In accordance with 10 CFR 40.65 and per License Condition No. 12.2 of Source Materials License SUA-1548, please find attached the Semi-Annual Effluent and Environmental Monitoring Report for the period January 1 through June 30, 2016. Copies of this report are also being forwarded to the Deputy Director, Division of Decommissioning, USNRC, Mr. Douglas Mandeville, USNRC Headquarters and Mr. Tony Vogel, Division Director, Division of Nuclear Material Safety, Region IV.

Due to environmental air results not being received within 60 days of the end of the reporting period, a supplemental report will be submitted as soon as Cameco receives the air sample results from the certified laboratory. Copies of the report will be forwarded to all parties mentioned above.

If you have questions regarding the report, please contact me at (307) 358-6541 ext. 458 or by email at [Mike\\_Thomas@cameco.com](mailto:Mike_Thomas@cameco.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Mike Thomas", written over a horizontal line.

Mike Thomas  
Director, SHEQ  
Cameco Resources

Attachments: Semi-Annual Effluent and Environmental Monitoring Report

IE48  
NMSS20  
NMSS

KG/th

cc: Deputy Director, NRC w/ att CERTIFIED MAIL #7015 1520 0001 9364 1506  
Mr. Doug Mandeville, NRC w/att CERTIFIED MAIL #7015 1520 0001 9364 1513  
Mr. Tony Vogel, DDNMS w/att CERTIFIED MAIL #7015 1520 0001 9364 1520  
File SR 4.6.4.1 w/att

**POWER RESOURCES, INC.  
D/B/A CAMECO RESOURCES**

**USNRC SOURCE MATERIAL LICENSE  
NO. SUA-1548**

**DOCKET NO. 40-8964**

**SEMI-ANNUAL EFFLUENT AND  
ENVIRONMENTAL MONITORING REPORT**

**FOR THE PERIOD**

**JANUARY 1 THROUGH  
JUNE 30, 2016**

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## **1 INJECTION RATES, RECOVERY RATES, AND INJECTION TRUNK-LINE PRESSURES FOR EACH SATELLITE FACILITY**

Tables 1A through 1C of Attachment A contain rate and pressure data at the satellite facilities for the period of the report.

### **1.1 Satellite No. 1**

Satellite No. 1 did not operate during the report period, as restoration activities in the A and B Wellfield are complete. An alternate concentration limit (ACL) license amendment for the completion of restoration of Mine Unit B was submitted May 22, 2013. On December 3, 2013, a public meeting was held to discuss NRC staff's acceptance review of Cameco Resources' (Cameco's) ACL request for Mine Unit B. Cameco determined that additional sampling was required to determine if stability has been achieved in the mine unit. Quarterly sampling commenced in the first quarter of 2014 and has been ongoing to present date. A follow up meeting with NRC staff was conducted September 28, 2015 to discuss the status of the Mine Unit B ACL. NRC asked for additional information regarding elevated uranium concentrations above baseline in some of the ring monitor wells in Mine Unit B. Cameco said that we would review the data. Currently Cameco is continuing with the quarterly samples and evaluating the data. There are no injection or recovery rates for the report period.

### **1.2 Satellites and Central Processing Plant**

The operating information for Satellite No. 2, Satellite No. 3, Satellite SR-1, Satellite SR-2, and the Central Processing Plant (CPP) are contained in Tables 1A, 1B, and 1C. The injection rates listed are the total recovery rates minus the purge flow bleed. The bleed from Satellites No. 2 and No. 3 is treated for uranium, radium, and selenium removal and pumped to Purge Storage Reservoir #2 (PSR-2) prior to land application at the Satellite No. 2 Land Application Facility (Irrigator #2). Waste water brine from the reverse osmosis (RO) system at Satellite No. 2 is disposed by either deep well injection through a permitted waste disposal well, or treated and pumped to PSR-2 for further land application at Irrigator #2. Bleed from Satellites SR-1, SR-2, and the CPP is disposed of by deep well injection through permitted waste disposal wells.

### **1.3 North Butte Satellite Facility**

The operational data for North Butte Satellite is contained in Tables 1A, 1B, and 1C. The injection rates represent the total recovery rates minus the purge flow bleed. The bleed from the satellite is pumped to the deep disposal well for disposal or stored in the storage pond prior to deep well injection.

## **2 RESULTS OF EFFLUENT AND ENVIRONMENTAL MONITORING INCLUDING WATER QUALITY ANALYSES AND MONITORING REQUIRED BY THE WDEQ PERMIT FOR THE OPERATING IRRIGATION SYSTEMS**

### **2.1 Stack Emission Surveys**

All yellowcake processing activities (elution, drying and packaging) were conducted at the Smith Ranch CPP. The dryers at the CPP are zero emission vacuum dryers and do not require stack testing.

The Central Processing Facility (CPF) at the Highland Uranium Project has been refurbished with zero emission vacuum dryers, which will not require stack testing, and is on stand-by status.

### **2.2 Air Particulate, Radon, and Gamma Radiation Monitoring**

#### ***2.2.1 Smith Ranch-Highland***

Smith Ranch-Highland (SRH) maintains an air monitoring program at six (6) locations on and around the licensed area. The air monitoring stations are used to monitor air particulates, passive radon gas, and passive gamma radiation. Due to the completion of construction activities of the Highland CPF, monitoring at air stations AS-4 and AS-5 were discontinued at the end of 2014 and will resume monitoring one year prior to the Highland CPF becoming operational. One additional station (AS-6) will be used to monitor conditions downwind of the Reynolds Ranch Satellite Facility once the facility is constructed and becomes operational.

The air stations are located as follows:

- Air Station No. 1 (AS-1; Dave's Water Well): This station monitors background conditions, upwind of both the Smith Ranch and HUP wellfields and yellowcake processing facilities.
- Air Station No. 2 (AS-2; Smith Ranch Restricted Area): This station monitors conditions downwind of the Smith Ranch CPP Restricted Area Boundary.
- Air Station No. 3 (AS-3; Vollman Ranch): This station monitors the nearest downwind resident to the Smith Ranch CPP Restricted Area.
- Air Station No. 4 (AS-4; HUP Restricted Area): This station monitors conditions downwind of the HUP CPF Restricted Area Boundary.
- Air Station No. 5 (AS-5; Fowler Ranch): This station monitors the nearest downwind resident to the HUP CPF Restricted Area

- Air Station No. 6 (AS-6; Reynolds Ranch Satellite Area): This station will monitor conditions downwind of the Reynolds Ranch Satellite Facility once the facility is constructed and becomes operational.

Monitoring at station AS-6 was not conducted during the report period since the Reynolds Ranch Satellite Facility has not been constructed. Monitoring of conditions at AS-6 will commence during construction of the facility and before it becomes operational.

Table 2 shows the air particulate and radon data collected at stations AS-1 through AS-5 during the report period. Review of data collected during the report period shows that the concentrations of all parameters are less than the 10 CFR 20, Appendix B, Effluent Concentration Limits. Note that second quarter air sampling data shows “Not Available”. Analytical results of the second quarter air sampling data were not provided to Cameco in time for this report. Cameco Resources will submit this data in a supplemental report when these results become available. Non-detect at the reporting limit (ND) sample results are labeled as such in Table 2.

Table 3 shows the gamma radiation data collected at stations AS-1 through AS-5 during the report period. As stated previously, monitoring at air stations AS-4 and AS-5 was discontinued at the end of 2014 and will resume monitoring when the Highland CPF becomes operational. Review of data collected during the report period shows that gamma radiation levels were within the range of previously reported values and comparable to upwind background values at station AS-1.

### ***2.2.2 NB Satellite Facility***

North Butte maintains an Air Monitoring Station program at six (6) various locations on and around the licensed area. The air monitoring stations are used to monitor air particulates, passive radon gas, and passive gamma radiation. Two (2) additional passive gamma and passive radon gas environmental stations are included in the license area.

The air stations, passive gamma, and passive radon gas monitoring stations are located as follows:

- Air Station NB8 (Phister Ranch): This station monitors the nearest public residence to North Butte Satellite Area.
- Air Station NB9 (West Air Station): This station monitors background conditions, upwind from the North Butte Satellite Area.
- Air Station NB11 (North Butte): This station monitors the north side of the North Butte Licensed Area.
- Air Station NB12 (North East Air Station): This station monitors downwind

conditions from North Butte Satellite and Well Fields.

- Air Station NB13 (Anedarko Rd): This Station monitors the south side of the North Butte Licensed Area.
- Air Station SatPad (Satellite pad next to man camp): This station monitors the exposure to the off-shift operations staff that remain on-site during off shift hours.
- Environmental Station (Fence line near Frac Tanks): This station monitors radon gas and gamma radiation only.
- Environmental station (Fence line on Christensen Rd): This station monitors radon gas and gamma radiation only.

Table 2 shows the air particulate and radon data collected at air stations NB8, NB9, NB11, NB12, NB13, and Satellite Pad. In addition to the six air stations there are two additional environmental stations with gamma and radon data only. Review of data collected during the report period shows that the concentrations of all parameters are significantly less than the 10 CFR 20, Appendix B, Effluent Concentration Limits. Note that second quarter air sampling data shows “Not Available”. Analytical results of the second quarter air sampling data were not provided to Cameco in time for this report. Cameco Resources will submit this data in a supplemental report when these results become available. Non-detect at the reporting limit (ND) sample results are labeled as such in Table 2.

Table 3 shows the gamma radiation data collected at the six (6) air stations and the two (2) environmental stations for the report period. Review of data collection during the report period shows that gamma radiation levels were comparable to upwind background values at station NB9 and the control badge.

## **2.3 Water Sampling Data**

### ***2.3.1 SRH Groundwater and Surface Water Monitoring Stations***

During the report period, monitoring was completed at twenty two (22) water wells, ten (10) stock ponds, and one (1) creek throughout the permit area. Water samples are collected from water wells, stock ponds and a creek on a quarterly basis for analysis of uranium and radium-226. Sampling constituents for environmental ground water and surface water monitoring programs is detailed in NRC License Application Section 5.3.5 and 5.3.6, respectively. Table 4 provides the analytical data for samples collected during the report period. A review of data collected during the report period shows one (1) stock pond and eleven (11) water wells (SW-2, GW-5, GW-6, GW-8, GW-9, GW-10, GW-12, GW-13, GW-16, GW-21 GW-31, and GW-33) did not run during the report period. A review of data collected from the available water wells, stock ponds and creek show that the concentrations of uranium and radium-226 are below the 10 CFR 20, Appendix B,



Effluent Concentration Limits of 3.0E-07 and 6.0E-08  $\mu\text{Ci}/\text{mL}$ , respectively. As shown in Table 4 the acronyms of “ND” denotes levels as “Not Detected at the Reporting Limit” and “NA” denotes levels as “Not Applicable”.

### ***2.3.2 NB Groundwater and Surface Water Monitoring Stations***

During the report period, monitoring was completed at two (2) impoundments and eight (8) surface water sites. Water samples are collected from water wells (within 1 km from active mine unit), impoundments, and surface water sites on a quarterly basis for analysis of uranium and radium-226. Table 4 provides the analytical data for samples collected during the report period. A review of Table 4 shows that during the first quarter of the report period eight (8) Surface Water Sites and two (2) impoundments (NBSWS1, NBSWS2, NBI2, NBI6, NBSU1, NBSU2, NBSD1, NBSD2, NBSD3, and NBSU4) were dry and there was no water available for sampling. During the second quarter of the report period seven (8) Surface Water Sites and one (1) impoundment (NBSWS1, NBSWS2, NBI2, NBSU1, NBSU2, NBSD1, NBSD2, NBSD3, and NBSU4) were dry and there was no water available for sampling. A review of data collected from the available Surface Water Sites during the report period show that the concentrations of uranium and radium-226 are less than the effluent concentration limits, as shown in 10 CFR 20, Appendix B. As shown in Table 4 the acronyms of “ND” denotes levels as “Not Detected at the Reporting Limit” and “NA” denotes levels as “Not Applicable”.

## **2.4 SRH Wastewater Land Application Facilities Monitoring**

### ***2.4.1 Soil and Vegetation Sampling***

In accordance with License Condition 12.2 for the Satellite No. 1 and Satellite No. 2 Wastewater Land Application Facilities, soil and vegetation sampling of the irrigation areas is conducted in late summer of each year. The soil and vegetation data are collected to monitor and evaluate any adverse effects to the irrigation areas. The 2016 soil and vegetation sampling at the irrigation areas will be conducted in August 2016 and results will be included with the July 1 through December 31, 2016 semi-annual report.

### ***2.4.2 Irrigation Fluid***

Cameco monitors the treated irrigation fluid that is disposed of at both irrigation facilities per the approved license application. Grab samples are collected at the discharge of PSR-2 during each month of operation and analyzed for various parameters. Irrigator No. 2 was operational for the month of June while Irrigator No. 1 was not operational for the entire reporting period, as noted in Table 5 and Table 6, respectively.

### ***2.4.3 Radium Treatment Systems***

Cameco collects grab samples each month to ensure that the radium-226 treatment systems are adequately treating wastewater from Satellites No. 2 and No. 3 prior to discharge into

PSR-2. No samples were collected from the Satellite No. 1 radium treatment system since Satellite No. 1 did not operate during the report period. The monthly radium-226 grab samples for Satellite No. 2 and No. 3 are collected at the discharge point of the selenium treatment plant. Review of the monitoring data provided in Table 7 shows that radium-226 concentrations were less than the 10 CFR 20, Appendix B, Effluent Concentration Limit of  $6.00E-8$   $\mu\text{Ci/mL}$ .

#### ***2.4.4 Soil Water Samples***

In accordance with the approved license application, Cameco collects soil water samples at the irrigation areas in June of each year and analyzes them for various parameters, referenced in Tables 8A and 8B. In June 2016, sampling of the lysimeters at Irrigator #2 was attempted per the standard sampling method, however, insufficient water was present to collect and perform an analysis. Irrigator #1 did not operate during the report period.

#### ***2.4.5 Satellite No. 1 Purge Storage Reservoir Monitor Well***

Monitoring for shallow monitor well, located southwest of the Satellite No. 1 Purge Storage Reservoir (PSR-1), has been discontinued as detailed in letter dated September 29, 2014, titled Discontinuation of Monitoring Plan, Purge Storage Reservoir No. 1 (PSR-1) Smith Ranch – Highland Uranium Project, Permit 633, Cameco Resources, as Cameco has fulfilled all requirements of Permit 633.

#### ***2.4.6 Satellite No. 2 Purge Storage Reservoir Shallow Wells***

Shallow Wells No. 1 and No. 2 are located adjacent to the south and east sides of the reservoir, respectively. Water levels are measured on a quarterly basis and ground water samples are required on a semi-annual basis from the two shallow monitoring wells located adjacent to PSR-2. Water levels were taken March 16, 2016 while sampling and water levels were conducted May 19, 2016. Table 9 contains the data for water levels and samples taken during this period.

### **3 SAFETY AND ENVIRONMENTAL EVALUATIONS**

All safety and environmental evaluations made by the Safety and Environmental Review Panel (SERP) and resulting changed pages to the Operations Plan and Reclamation Plan of the approved license must be submitted on an annual basis, along with one of the semi-annual effluent and environmental monitoring reports. All SERP evaluations completed during 2016 will be submitted in the second half 2016 semi-annual report.

### **4 NRC SEMI-ANNUAL INSPECTION**

A routine inspection was conducted June 20-23, 2016. The final report was not received during the reporting period and will be included in the second half semi-annual report.

## **5 GAS HILLS AND RUTH ISL PROJECTS**

The Gas Hills and Ruth ISL Projects are licensed for commercial ISL uranium recovery activities as satellite facilities to the Smith Ranch-Highland Uranium Project. The projects remained non-operational during the report period

Other activities conducted during the report period consisted of quarterly inspections of the Ruth evaporation ponds in accordance with License Condition 10.2.2 of SUA-1548. Inspection of the perimeter fence, pond embankments, and pond liners yielded no deficiencies during the report period.

**ATTACHMENT A**  
**DATA TABLES 1-9**

**TABLE 1  
RATES AND PRESSURES  
SATELLITE FACILITIES  
1st and 2nd Quarters 2016**

**TABLE 1A  
AVERAGE INJECTION RATES (GPM)**

<b>MONTH</b>	<b>Satellite No. 2</b>	<b>Satellite No. 3</b>	<b>Central Processing Plant</b>	<b>Satellite SR-1</b>	<b>Satellite SR-2</b>	<b>North Butte</b>
Jan-16	0	3,828	0	4,001	4,310	3,898
Feb-16	0	3,765	0	3,946	4,253	3,872
Mar-16	0	3,303	0	3,764	4,210	3,856
Apr-16	0	3,671	0	3,933	4,208	3,750
May-16	0	3,676	0	2,814	2,964	3,187
Jun-16	0	3,448	0	2,941	3,407	4,080

**TABLE 1B  
AVERAGE RECOVERY RATES (GPM)**

<b>MONTH</b>	<b>Satellite No. 2</b>	<b>Satellite No. 3</b>	<b>Central Processing Plant</b>	<b>Satellite SR-1</b>	<b>Satellite SR-2</b>	<b>North Butte</b>
Jan-16	0	3,886	0	4,022	4,333	3,927
Feb-16	0	3,828	0	3,968	4,275	3,911
Mar-16	0	3,357	0	3,785	4,231	3,897
Apr-16	0	3,733	0	3,955	4,230	3,786
May-16	0	3,741	0	2,830	2,979	3,214
Jun-16	0	3,510	0	2,957	3,425	4,115

**TABLE 1C  
INJECTION TRUNK LINE PRESSURES (PSI)**

<b>MONTH</b>	<b>Satellite No. 2</b>	<b>Satellite No. 3</b>	<b>Central Processing Plant</b>	<b>Satellite SR-1</b>	<b>Satellite SR-2</b>	<b>North Butte</b>
Jan-16	0	101	0	102	165	98
Feb-16	0	98	0	106	173	95
Mar-16	0	101	0	114	173	95
Apr-16	0	119	0	106	170	89
May-16	0	128	0	84	157	79
Jun-16	0	126	0	104	175	96

**TABLE 2**  
**AIR SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

SAMPLE LOCATION	SAMPLE PERIOD	RADIONUCLIDE (µCi/ml)	CONCENTRATION (µCi/ml)	ERROR EST. +/- (µCi/ml)	L.L.D. (µCi/ml)	EFF. CONC. LIMIT (µCi/ml)	% EFF. CONC. LIMIT %
AS-1 DAVE'S WATER WELL Air Station Background Site	1st Quarter	U-Nat	ND	4E-10	1.00E-16	9.00E-14	0.0
		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
		Pb-210	1.60E-14	1.20E-15	2.00E-15	6.00E-13	2.7
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	7.00E-10	5.00E-11	3.00E-10	1.00E-08	7.0
	AS-2 FENCE LINE Air Station Restricted Area Boundary (Background not deducted)	1st Quarter	U-Nat	7.80E-16	4.90E-09	1.00E-16	9.00E-14
Th-230			ND	NA	1.00E-16	3.00E-14	0.0
Ra-226			1.30E-16	3.20E-17	1.00E-16	9.00E-13	0.0
Pb-210			1.40E-14	1.30E-15	2.00E-15	6.00E-13	2.3
2nd Quarter		U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	#VALUE!
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
All Period		Rn-222	1.10E-09	7.00E-77	3.00E-10	1.00E-08	11.0
AS-3 VOLLMAN RANCH Air Station Downwind Nearest Residence (Background not deducted)		1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14
	Th-230		ND	NA	1.00E-16	3.00E-14	0.0
	Ra-226		ND	NA	1.00E-16	9.00E-13	0.0
	Pb-210		1.00E-14	1.10E-15	2.00E-15	6.00E-13	1.7
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	1.10E-09	7.00E-11	3.00E-10	1.00E-08	11.0
	AS-4 HUP RESTRICTED AREA Air Station HUP Overlook (Background not deducted)	1st Quarter	U-Nat			1.00E-16	9.00E-14
Th-230					1.00E-16	3.00E-14	0.0
Ra-226					1.00E-16	9.00E-13	0.0
Pb-210					2.00E-15	6.00E-13	0.0
2nd Quarter		U-Nat			1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
All Period		Rn-222			3.00E-10	1.00E-08	0.0
AS-5 FOWLER RANCH Air Station Downwind (HUP) Nearest Residence (Background not deducted)		1st Quarter	U-Nat			1.00E-16	9.00E-14
	Th-230				1.00E-16	3.00E-14	0.0
	Ra-226				1.00E-16	9.00E-13	0.0
	Pb-210				2.00E-15	6.00E-13	0.0
	2nd Quarter	U-Nat			1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222			3.00E-10	1.00E-08	0.0
	AS-6 REYNOLDS SATELLITE	NOT CONSTRUCTED					

\*ND = Non-detect at the reporting limit  
\*NA = Not Applicable

**TABLE 2**  
**AIR SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - NB**  
**1st and 2nd Quarters 2016**

SAMPLE LOCATION	SAMPLE PERIOD	RADIONUCLIDE (µCi/ml)	CONCENTRATION (µCi/ml)	ERROR EST. +/- (µCi/ml)	L.L.D. (µCi/ml)	EFF. CONC. LIMIT (µCi/ml)	% EFF. CONC. LIMIT %
<b>NB8</b>							
Pfister Ranch	1st Quarter	U-Nat	1.70E-16	NA	1.00E-16	9.00E-14	0.2
Air Station		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
Nearest Residence		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
(Background not deducted)		Pb-210	6.10E-15	8.50E-16	2.00E-15	6.00E-13	1.0
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	1.10E-09	7.00E-11	3.00E-10	1.00E-08	11.0
<b>NB9</b>							
West Airstation	1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14	0.0
Air Station		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
Upwind		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
(Background not deducted)		Pb-210	1.30E-14	1.50E-15	2.00E-15	6.00E-13	2.2
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	7.00E-10	5.00E-11	3.00E-10	1.00E-08	7.0
<b>NB11</b>							
North Butte	1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14	0.0
Air Station		Th-230	5.10E-16	1.6E-16	1.00E-16	3.00E-14	0.0
North Side of Licenced Area		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
(Background not deducted)		Pb-210	1.40E-14	1.20E-15	2.00E-15	6.00E-13	2.3
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	7.00E-10	5.00E-11	3.00E-10	1.00E-08	7.0
<b>NB12</b>							
North East Airstation	1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14	0.0
Air Station		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
Downwind		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
(Background not deducted)		Pb-210	1.30E-14	1.40E-15	2.00E-15	6.00E-13	2.2
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	8.00E-10	6.00E-11	3.00E-10	1.00E-08	8.0
<b>NB13</b>							
Anedarko Road	1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14	0.0
Air Station		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
Downwind		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
(Background not deducted)		Pb-210	1.40E-14	1.70E-15	2.00E-15	6.00E-13	2.3
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	5.50E-09	1.70E-10	3.00E-10	1.00E-08	55.0
<b>Satellite Pad Operations Mancamp</b>							
Air Station	1st Quarter	U-Nat	ND	NA	1.00E-16	9.00E-14	0.0
Mancamp		Th-230	ND	NA	1.00E-16	3.00E-14	0.0
(Background not deducted)		Ra-226	ND	NA	1.00E-16	9.00E-13	0.0
		Pb-210	1.80E-14	1.50E-15	2.00E-15	6.00E-13	3.0
	2nd Quarter	U-Nat	NOT AVAILABLE		1.00E-16	9.00E-14	0.0
		Th-230			1.00E-16	3.00E-14	0.0
		Ra-226			1.00E-16	9.00E-13	0.0
		Pb-210			2.00E-15	6.00E-13	0.0
	All Period	Rn-222	7.00E-10	5.00E-11	3.00E-10	1.00E-08	7.0
<b>Christensen Rd</b>							
Environmental Station	All Period	Rn-222	9.00E-10	6E-11	3.00E-10	1.00E-08	9.0
Fence Line							
<b>Frac Tanks</b>							
Environmental Station	All Period	Rn-222	1.10E-09	7E-11	3.00E-10	1.00E-08	11.0
FenceLine							

\*ND = Non-detect at the reporting limit  
\*NA = Not Applicable

TABLE 3

DIRECT RADIATION (GAMMA) MEASUREMENT DATA  
 ENVIRONMENTAL MONITORING SITES - SRH  
 1st & 2nd QUARTERS 2016

SAMPLE LOCATION	SAMPLE PERIOD	EXPOSURE RATE (mR/qtr)
<b>AS-1</b>		
<b>DAVE'S WATER WELL</b>		
Air Station	1st Quarter	35
Background Site	2nd Quarter	44
<b>AS-2</b>		
<b>FENCE LINE</b>		
Air Station	1st Quarter	42
Restricted Area Boundary	2nd Quarter	50
<b>AS-3</b>		
<b>VOLLMAN'S RANCH</b>		
Air Station	1st Quarter	35
Downwind Nearest Residence	2nd Quarter	40
<b>AS-4</b>		
<b>HUP RESTRICTED AREA</b>		
Air Station	1st Quarter	MONITORING DISCONTINUED WILL RESUME MONITORING WHEN THE HIGHLAND CPF BECOMES OPERATIONAL
HUP Overlook	2nd Quarter	
<b>AS-5</b>		
<b>FOWLER RANCH</b>		
Air Station	1st Quarter	MONITORING DISCONTINUED WILL RESUME MONITORING WHEN THE HIGHLAND CPF BECOMES OPERATIONAL
Downwind of HUP Nearest Residence	2nd Quarter	
<b>AS-6</b>		
<b>REYNOLDS SATELLITE</b>		
	NOT CONSTRUCTED	
<b>CONTROL</b>		
	1st Quarter	30
	2nd Quarter	43

Background has not been deducted  
 From any readings



TABLE 3

**DIRECT RADIATION (GAMMA) MEASUREMENT DATA  
ENVIRONMENTAL MONITORING SITES - NB  
1st & 2nd QUARTERS 2016**

SAMPLE LOCATION	SAMPLE PERIOD	EXPOSURE RATE (mR/qtr)
<b>NB8</b>		
<b>Phister Ranch</b>		
Air Station	1st Quarter	37
Nearest Residence	2nd Quarter	41
<b>NB9</b>		
<b>West Air Station</b>		
Air Station	1st Quarter	34
Upwind	2nd Quarter	36
Background		
<b>NB11</b>		
<b>North Butte</b>		
Air Station	1st Quarter	36
Downwind	2nd Quarter	42
North Side of Licenced Area		
<b>NB12</b>		
<b>North East Air Station</b>		
Air Station	1st Quarter	37
Downwind	2nd Quarter	41
<b>NB13</b>		
<b>Anedarko Road</b>		
Air Station	1st Quarter	38
Downwind	2nd Quarter	39
<b>Satellite Pad</b>		
Air Station	1st Quarter	35
	2nd Quarter	37
<b>Environmental Station</b>		
<b>Frac Tanks</b>		
Fence Line	1st Quarter	36
Upwind	2nd Quarter	38
Background		
<b>Environmental Station</b>		
<b>Christensen Rd.</b>		
Fence Line	1st Quarter	37
Downwind	2nd Quarter	42
<b>CONTROL</b>		
	1st Quarter	35
	2nd Quarter	40

Background has not been deducted  
From any readings

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>SW-1</b> Stock Pond Section 3 T35N, R74W	1st Quarter	U-Nat Ra-226	0.0296			2.0E-08	3.0E-07	6.7
				0.17	1.20E-01	1.7E-10	6.0E-08	0.3
	2nd Quarter	U-Nat Ra-226	0.0184			1.2E-08	3.0E-07	4.2
				0.15	1.10E-01	1.5E-10	6.0E-08	0.3
<b>SW-2</b> Stock Pond Section 2 T35N, R74W	1st Quarter	U-Nat Ra-226	DRY			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0
	2nd Quarter	U-Nat Ra-226	DRY			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0
<b>SW-3</b> Stock Pond Section 35 T36N, R74W	1st Quarter	U-Nat Ra-226	0.0372			2.5E-08	3.0E-07	8.4
				0.73	1.70E-01	7.3E-10	6.0E-08	1.2
	2nd Quarter	U-Nat Ra-226	DRY			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0
<b>SW-4</b> Stock Pond Section 36 T36N, R74W	1st Quarter	U-Nat Ra-226	DRY			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0
	2nd Quarter	U-Nat Ra-226	ND			NA	3.0E-07	NA
				0.35	1.60E-01	3.5E-10	6.0E-08	0.6
<b>SW-5</b> Stock Pond Section 21 T36N, R73W	1st Quarter	U-Nat Ra-226	0.0018			1.2E-09	3.0E-07	0.4
				0.54	2.00E-01	5.4E-10	6.0E-08	0.9
	2nd Quarter	U-Nat Ra-226	0.0023			1.6E-09	3.0E-07	0.5
				0.43	1.60E-01	4.3E-10	6.0E-08	0.7

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>SW-6</b> Stock Pond Section 22 T36N, R73W	1st Quarter	U-Nat Ra-226	ND			NA 1.8E-10	3.0E-07 6.0E-08	NA 0.3
	2nd Quarter	U-Nat Ra-226	0.0004	0.50	1.60E-01	2.7E-10 5.0E-10	3.0E-07 6.0E-08	0.1 0.8
<b>SW-7</b> Stock Pond Section 22 T36N, R73W	1st Quarter	U-Nat Ra-226	DRY			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	0.0009	0.60	6.10E-01	6.1E-10 6.0E-10	3.0E-07 6.0E-08	0.2 1.0
<b>SW-8</b> Stock Pond Section 18 T36N, R72W	1st Quarter	U-Nat Ra-226	0.0020	0.47	1.70E-01	1.4E-09 4.7E-10	3.0E-07 6.0E-08	0.5 0.8
	2nd Quarter	U-Nat Ra-226	0.0007	0.72	2.10E-01	4.7E-10 7.2E-10	3.0E-07 6.0E-08	0.2 1.2
<b>SW-9</b> Stock Pond Section 18 T36N, R72W	1st Quarter	U-Nat Ra-226	0.0015	0.12	1.30E-01	1.0E-09 1.2E-10	3.0E-07 6.0E-08	0.3 0.2
	2nd Quarter	U-Nat Ra-226	0.0013	0.10	1.30E-01	8.8E-10 1.0E-10	3.0E-07 6.0E-08	0.3 0.2
<b>SW-10</b> Stock Pond Section 19 T36N, R72W	1st Quarter	U-Nat Ra-226	DRY			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	0.0036	2.30	5.20E-01	2.4E-09 2.3E-09	3.0E-07 6.0E-08	0.8 3.8

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>GW-1</b> Windmill Section 1 T35N, R74W	1st Quarter	U-Nat Ra-226	0.0288			1.9E-08	3.0E-07	6.5
				1.00	2.90E-01	1.0E-09	6.0E-08	1.7
	2nd Quarter	U-Nat Ra-226	0.0325			2.2E-08	3.0E-07	7.3
				0.95	2.00E-01	9.5E-10	6.0E-08	1.6
<b>GW-2</b> Solar Well Section 35 T36N, R74W	1st Quarter	U-Nat Ra-226	0.0365			2.5E-08	3.0E-07	8.2
				0.73	1.70E-01	7.3E-10	6.0E-08	1.2
	2nd Quarter	U-Nat Ra-226	0.0340			2.3E-08	3.0E-07	7.7
				0.76	1.90E-01	7.6E-10	6.0E-08	1.3
<b>GW-3</b> Windmill Section 27 T36N, R74W	1st Quarter	U-Nat Ra-226	0.1740			1.2E-07	3.0E-07	39.3
				1.50		1.5E-09	6.0E-08	2.5
	2nd Quarter	U-Nat Ra-226	0.1610		3.60E-01	1.1E-07	3.0E-07	36.3
				1.50	3.60E-01	1.5E-09	6.0E-08	2.5
<b>GW-4</b> Windmill Section 23 T36N, R74W	1st Quarter	U-Nat Ra-226	0.0736			5.0E-08	3.0E-07	16.6
				1.00	1.90E-01	1.0E-09	6.0E-08	1.7
	2nd Quarter	U-Nat Ra-226	0.1110			7.5E-08	3.0E-07	25.0
				0.57	1.70E-01	5.7E-10	6.0E-08	1.0
<b>GW-5</b> Windmill Section 30 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00	3.0E-07	0.0
						0.0E+00	6.0E-08	0.0

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>GW-6</b> Windmill Section 28 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-8</b> Windmill Section 23 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-9</b> Windmill Section 14 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-10</b> Water Well Section 14 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-11</b> Water Well Section 11 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	0.0010	0.49	1.60E-01	6.8E-10 4.9E-10	3.0E-07 6.0E-08	0.2 0.8

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>GW-12</b> Water Well Section 7 T36N, R72W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-13</b> Water Well Section 9 T36N, R72W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-14</b> Water Well Section 10 T36N, R72W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	0.0150	1.00	2.70E-01	1.0E-08 1.0E-09	3.0E-07 6.0E-08	3.4 1.7
<b>GW-15</b> Water Well Section 15 T36N, R72W	1st Quarter	U-Nat Ra-226	0.0208	0.92	1.90E-01	1.4E-08 9.2E-10	3.0E-07 6.0E-08	4.7 1.5
	2nd Quarter	U-Nat Ra-226	0.0193	1.10	2.90E-01	1.3E-08 1.1E-09	3.0E-07 6.0E-08	4.4 1.8
<b>GW-16</b> Water Well Section 11 T36N, R72W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>GW-17</b> Water Well Section 8 T36N, R72W	1st Quarter	U-Nat Ra-226	0.0032			2.2E-09 6.9E-10	3.0E-07 6.0E-08	0.7 1.2
	2nd Quarter	U-Nat Ra-226	0.0032	0.69	1.50E-01	2.2E-09 5.1E-10	3.0E-07 6.0E-08	0.7 0.9
<b>GW-18</b> Water Well Section 2 T36N, R72W	1st Quarter	U-Nat Ra-226	0.0181			1.2E-08 1.3E-09	3.0E-07 6.0E-08	4.1 2.2
	2nd Quarter	U-Nat Ra-226	0.0169	1.30	3.20E-01	1.1E-08 1.2E-09	3.0E-07 6.0E-08	3.8 2.0
<b>GW-20</b> Water Well Section 27 T36N, R73W	1st Quarter	U-Nat Ra-226	ND			NA 1.3E-10	3.0E-07 6.0E-08	NA 0.2
	2nd Quarter	U-Nat Ra-226	ND	0.13	1.10E-01	NA 3.1E-10	3.0E-07 6.0E-08	NA 0.5
<b>GW-21</b> Water Well Section 17 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>GW-31</b> Water Well Section 24 T36N, R74W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - SRH**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>EFF. CONC. LIMIT (µCi/ml)</b>	<b>% EFF. CONC. LIMIT</b>
<b>GW-32</b> Water Well Section 19 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	0.0998	1.70	4.00E-01	6.8E-08 1.7E-09	3.0E-07 6.0E-08	22.5 2.8
<b>GW-33</b> Water Well Section 21 T36N, R73W	1st Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
	2nd Quarter	U-Nat Ra-226	NOT RUNNING			0.0E+00 0.0E+00	3.0E-07 6.0E-08	0.0 0.0
<b>Sage Creek</b> Creek Section 12 T35N, R73W	1st Quarter	U-Nat Ra-226	0.1300	0.07	1.20E-01	8.8E-08 7.0E-11	3.0E-07 6.0E-08	29.3 0.1
	2nd Quarter	U-Nat Ra-226	0.0879	0.06	1.00E-01	6.0E-08 6.0E-11	3.0E-07 6.0E-08	19.8 0.1



TABLE 4  
WATER SAMPLING DATA  
ENVIRONMENTAL MONITORING SITES - NB  
1st and 2nd Quarters 2016

SAMPLE LOCATION	SAMPLE DATE	RADIONUCLIDE	CONCENTRATION (mg/L)	CONCENTRATION (pCi/L)	ERROR EST. +/- (pCi/L)	CONCENTRATION (µCi/ml)	EFF. CONC. LIMIT (µCi/ml)	% EFF. CONC. LIMIT
NBSWS1 Surface Water Section 25 T43N, R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	0.0
		Ra-226				0.0E+00	6.0E-08	0.0
NBSWS2 Surface Water Section 26 T43N, R77W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
NB12 Impoundment Section 25 T43N, R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	0.0
		Ra-226				0.0E+00	6.0E-08	0.0
NB16 Impoundment Section 24 T44N, R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	0.0032			2.2E-09	3.0E-07	0.7
		Ra-226		0.20	1.00E-01	2.0E-10	6.0E-08	0.3
NBSU1 Upstream Section 18 T45N, R75W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA

**TABLE 4**  
**WATER SAMPLING DATA**  
**ENVIRONMENTAL MONITORING SITES - NB**  
**1st and 2nd Quarters 2016**

<b>SAMPLE LOCATION</b>	<b>SAMPLE DATE</b>	<b>RADIONUCLIDE</b>	<b>CONCENTRATION (mg/L)</b>	<b>CONCENTRATION (pCi/L)</b>	<b>ERROR EST. +/- (pCi/L)</b>	<b>CONCENTRATION (µCi/ml)</b>	<b>LIMIT (µCi/ml)</b>	<b>LIMIT</b>
<b>NBSU2</b> Upstream Section 13 T45N,R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
<b>NBSD1</b> DownStream Section 19 T44N, R75W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
<b>NBSD2</b> Downstream Section 24 T44N, R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
<b>NBSD3</b> Downstream Section 19 T44N, R75W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
<b>NBSU4</b> Upstream Section 24 T44N, R76W	1st Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA
	2nd Quarter	U-Nat	DRY			0.0E+00	3.0E-07	NA
		Ra-226				0.0E+00	6.0E-08	NA

**TABLE 5**

**SATELLITE NO. 1  
 LAND APPLICATION FACILITY (IRRIGATOR NO. 1)  
 MONTHLY IRRIGATION FLUID DATA  
 1st and 2nd Quarters 2016**

**IRRIGATION CYCLE**

<b>DATE SAMPLED</b>	<b>Jan-16</b>	<b>Feb-16</b>	<b>Mar-16</b>	<b>Apr-16</b>	<b>May-16</b>	<b>Jun-16</b>
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**VOLUME (AF)**

<b>MAJOR IONS (mg/L)</b>	Reporting Limit
Calcium	1.0
Magnesium	1.0
Sodium	1.0
Potassium	1.0
Bicarbonate	1.0
Sulfate	1.0
Chloride	1.0

**IRRIGATOR DID NOT OPERATE ALL REPORTING PERIOD**

**NON-METALS**

TDS @ 180° C (mg/L)	10.0
pH (standard units)	0.010
SAR	0.01

**TRACE METALS (mg/L)**

Arsenic	0.001
Barium	0.10
Boron	0.10
Selenium	0.001

**RADIOMETRIC**

U-nat (uCi/mL)	2.03E-10
Ra-226 (uCi/mL)	2.00E-10
Ra Err. Est. +/-	

TABLE 6

SATELLITE NO. 2  
 LAND APPLICATION FACILITY (IRRIGATOR NO. 2)  
 MONTHLY IRRIGATION FLUID DATA  
 1st and 2nd Quarters 2016

IRRIGATION CYCLE

DATE SAMPLED	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
VOLUME (AF)						17.8
<b>MAJOR IONS (mg/L)</b>	<b>Reporting Limit</b>					
Calcium	1.0					237
Magnesium	1.0					117
Sodium	1.0					89
Potassium	1.0					29
Bicarbonate	5.0					194
Sulfate	2.0					663
Chloride	1.0					240
	<b>IRRIGATOR DID NOT OPERATE</b>					
<b>NON-METALS</b>						
TDS @ 180° C (mg/L)	17.0					1660
pH (standard units)	0.010					8.07
SAR	0.1					1.2
<b>TRACE METALS (mg/L)</b>						
Arsenic	0.001					ND
Barium	0.1					ND
Boron	0.1					0.17
Selenium	0.001					0.014
<b>RADIOMETRIC</b>						
U-nat (uCi/mL)	2.03E-10					3.20E-10
Ra-226 (uCi/mL)	2.00E-10					1.50E-09
Ra Err. Est. +/- (uCi/mL)						4.00E-10

**TABLE 7**

**SELENIUM PLANT  
RADIUM TREATMENT SYSTEM DISCHARGE - SRH  
MONTHLY RADIUM GRAB SAMPLES  
1st and 2nd Quarters 2016**

<b>SAMPLE DATE</b>	<b>Jan-16</b>	<b>Feb-16</b>	<b>Mar-16</b>	<b>Apr-16</b>	<b>May-16</b>	<b>Jun-16</b>
<b>RADIOMETRIC</b>						
Ra-226 ( $\mu\text{Ci/mL}$ )	3.10E-09	1.60E-09	1.10E-09	8.00E-09	1.10E-09	2.40E-09
Ra Err. Est. +/-	6.80E-10	4.00E-10	2.70E-10	1.60E-09	3.60E-10	5.30E-10
<b>Eff. Con. Limit</b>	<b>6.00E-08</b>					

**TABLE 8A**

**SATELLITE NO. 1  
LAND APPLICATION FACILITY (IRRIGATOR NO. 1)  
ANNUAL SOIL WATER DATA  
1st and 2nd Quarters 2016**

<b>SAMPLE SITE</b>	<b>2'</b>	<b>4'</b>	<b>6'</b>
	<b>NW¼</b>	<b>NW¼</b>	<b>NW¼</b>
	<b>NE¼</b>	<b>NE¼</b>	<b>NE¼</b>
	<b>SW¼</b>	<b>SW¼</b>	<b>SW¼</b>
	<b>SE¼</b>	<b>SE¼</b>	<b>SE¼</b>
	<b>Lysimeter Composite</b>	<b>Lysimeter Composite</b>	<b>Lysimeter Composite</b>

**SAMPLE DATE**

	<b>LABORATORY</b>
<b>MAJOR IONS (mg/L)</b>	<b>REP. LIMIT</b>
Bicarbonate	1.0
Sulfate	1.0
Chloride	1.0

Irrigator did not run  
No sample water available to  
report

<b>NON-METALS</b>	
Cond (umho/cm)	1.0
pH (standard units)	0.010

<b>TRACE METALS (mg/L)</b>	
Boron	0.10
Selenium	0.001

<b>RADIOMETRIC</b>	
U-nat: (mg/L)	0.0003
Ra-226: (pCi/L)	0.2
Ra Err. Est. +/-	
U-nat: (uCi/mL)	2.03E-10
Ra-226: (uCi/mL)	2.00E-10
Ra Err. Est. +/-	

**TABLE 8B**

**SATELLITE NO. 2  
LAND APPLICATION FACILITY (IRRIGATOR NO. 2)  
ANNUAL SOIL WATER DATA  
1st and 2nd Quarters 2016**

<b>SAMPLE SITE</b>	<b>2'</b>	<b>4'</b>	<b>6'</b>
	<b>NW¼</b>	<b>NW¼</b>	<b>NW¼</b>
	<b>NE¼</b>	<b>NE¼</b>	<b>NE¼</b>
	<b>SW¼</b>	<b>SW¼</b>	<b>SW¼</b>
	<b>SE¼</b>	<b>SE¼</b>	<b>SE¼</b>
	<b>Lysimeter Composite</b>	<b>Lysimeter Composite</b>	<b>Lysimeter Composite</b>
<b>SAMPLE DATE</b>			
<b>MAJOR IONS (mg/L)</b>	<b>LABORATORY REP. LIMIT</b>		
Bicarbonate	1.0		
Sulfate	1.0		
Chloride	1.0		
<b>NON-METALS</b>		<b>Lysimeter replaced May 2014 No sample water available to report</b>	
Cond (umho/cm)	1.0		
pH (standard units)	0.010		
<b>TRACE METALS (mg/L)</b>			
Boron	0.10		
Selenium	0.001		
<b>RADIOMETRIC</b>			
U-nat: (mg/L)	0.0003		
Ra-226: (pCi/L)	0.2		
Ra Err. Est. +/-			
U-nat: (uCi/mL)	2.03E-10		
Ra-226: (uCi/mL)	2.00E-10		
Ra Err. Est. +/-			

TABLE 9

SATELLITE NO. 2  
 PURGE STORAGE RESERVOIR (PSR-2)  
 SHALLOW MONITORING WELLS  
 WATER LEVEL AND WATER QUALITY DATA  
 1st and 2nd Quarters 2016

SAMPLE SITE	Shallow Well		Shallow Well		
	(No. 1 South)		(No. 2 East)		
<b>SAMPLE DATE</b>		3/16/16	5/19/16		5/19/16
<b>WATER LEVEL (DTW)</b>	Laboratory Reporting Limit	13.5	13.3	12	13.1
<b>MAJOR IONS (mg/L)</b>					
Bicarbonate	5.0		382		439
Sulfate	8.0		1830		2210
Chloride	2.0		495		579
<b>NON-METALS</b>					
Cond (µmho/cm)	5.0		4510		5490
pH (standard units)	0.01		7.69		7.44
<b>TRACE METALS (mg/L)</b>					
Boron	0.050		ND		ND
Selenium	0.001		0.80		0.089
<b>RADIOMETRIC</b>					
U-nat (uCi/mL)	6.77E-10		3.60E-10		9.88E-11
Ra-226 (uCi/mL)	2.00E-10		2.00E-09		1.50E-09
Ra-226 Err. Est. +/- (uCi/mL)			4.70E-10		3.70E-10