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LOST CREEK ISR, LLC

February 23, 2018

40-9068

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

Re: Response to RAI on 2017-2018 Surety
Lost Creek ISR SUA-1598

Dear Mr. Saxton,

In reply to your inquiry on January 10, 2018 regarding the Lost Creek ISR Surety update for the 2017-2018 operating year Lost Creek ISR, LLC (LCI) provides the following response:

RAI:

***Description of Deficiency* (abridged)**

The 2017-2018 surety estimate does not include a line item with detailed information or an explanation of estimated costs for remediation of radioactive contamination in onsite subsurface material.

Basis for Request

Criterion 9(b)(2) of 10 CFR Part 40, Appendix A states that each cost estimate must contain "[a]n estimate of the amount of radioactive contamination in onsite subsurface material."

Formulation of RAI

The surety estimate should provide costs for cleanup of the subsurface radioactive contamination. For the historical spills, please provide, at a minimum, the area of impacted soils, the soil sampling results, estimated background soil levels for that spill area, the depth of the impacted soils, and, unit and totals costs for any cleanup. If a historical spill does not warrant remediation, then please list the cost for that unplanned release as "$0.0".

NMSS01

LCI REPLY:

A summary of the evaluation of areas potentially impacted by unplanned releases ("spill") was prepared based on an investigation completed for spills. Concentrations of radionuclides, natural uranium and radium-226, were determined in the soil through sampling and laboratory analysis in order to determine if cleanup was to occur during operations or if it could be deferred to decommissioning. These concentrations were compared to the "initial ALARA target cleanup criterion" for members of the public detailed in Technical Report Section 4.2.5.6 and summarized herein as requested in the RAI. Several areas that may have been impacted by spills would require cleanup during decommissioning according to this ultra-conservative approach. The initial evaluation of spills was intended to determine whether a spill should be cleaned up promptly based on worker exposure and is not necessarily consistent with the regulatory-based decommissioning standards that would be applied if decommissioning cleanup, based on public exposure standards, were to occur. For example, the criterion in 10 CFR 40 Appendix A criterion 6(6) would likely be used as an industry-wide accepted method of evaluating cleanup at Lost Creek. The two methods may or may not provide similar results and additional assessment would be needed.

Moreover, as described in Technical Report Section 6.5, the need for decommissioning soil cleanup would be evaluated differently than what was used for the enclosed surety cost calculation and, therefore, the method will likely be revised to be consist with regulation, agency guidance, and with industry standard. As stated in the aforementioned Criterion 9(b)(2), the amount of radioactive contamination may be estimated and could be calculated based on the actual concentrations of constituents in the deposited (i.e. spilled) liquid and applying it to the volume of soil impacted to obtain a concentration in soil. Using this methodology on the worst-case scenario, the estimated concentrations of uranium and Ra-226 in soil were significantly less than the actual soil analysis which would, in effect, nullify the requirement for cleanup for all of the documented spills thus far. Therefore, results from directly measuring concentrations in soil may be skewed high based on the potential existence of naturally occurring radioactive material and therefore very conservative. As stated in the TR Section 6.5.1 "*Elevated radiation levels resulting from the prior exploration activities and from naturally-occurring conditions will be used in the calculation of appropriate cleanup levels.*" Elevated background radiation levels have not been accounted for in the soil analysis and as TR Section 4.2.5.6 states, "*...should spills occur, LC ISR, LLC will collect additional soil samples outside the spill margins to further characterize the soil radionuclide concentrations so that when combined with the radionuclide analysis of the spill content, accurate cleanup levels can be established to meet the decommissioning "Radium Benchmark Dose" of 10 CFR 40, Appendix A, Criterion 6."* This sampling outside spill areas for additional localized background determination has not yet been conducted but will be as appropriate in the future.

Nonetheless, the most conservative evaluation of spills was conducted (**Attachment A**) and the resulting cleanup cost was provided for addition to the surety. The NRC should add the total cost to the surety and a detailed assessment of soil cleanup costs will be included in all future surety submittals which will include a more appropriate, regulatory- and industry-consistent method of evaluating surety cost for decommissioning cleanup.

Sincerely,

Michael D. Gaither
Manager EHS and Regulatory Affairs
Ur-Energy USA, Inc

Attachments: **Attachment A: Spill Cleanup Summary**

Cc: Deputy Director, Division of Decommissioning
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U.S. Nuclear Regulatory Commission
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John Saxton, NRC (via e-mail)
Nancy Williams, WDEQ-LQD, Lander (via e-mail)
Theresa Horne, Ur-Energy, Littleton (via e-mail)

ATTACHMENT A: Spill Cleanup Summary
Lost Creek ISR Project
SUA-1598

SPILL ID	DATE	VOL (gal)	AREA (acres)	Soil Analysis Data				Soil Background*		Net Soil Concentrations (minus bkg)				Cleanup Depth (cm)	Cleanup Depth (ft)	Cleanup Volume (cu yds)
				Top 5 cm		5 to 15 cm		0-15cm	0-15cm	Top 5 cm		5 to 15 cm				
				Soil Unat (mg/kg)	Soil Ra-226 (pCi/g)	Soil Unat (mg/kg)	Soil Ra-226 (pCi/g)	Soil Unat (mg/kg)	Soil Ra-226 (pCi/g)	Soil Unat (mg/kg)	Soil Ra-226 (pCi/g)	Soil Unat (mg/kg)	Soil Ra-226 (pCi/g)			
1I314	**8/2/2013**	**2200**	**0.08**	---	---	---	---	4.4	6.0	---	---	---	---	---	---	---
1I039A	**8/4/2013**	**24458**	**0.01**	---	---	---	---	4.4	6.0	---	---	---	---	---	---	---
1I103	**11/12/2013**	**3360**	**0.57**	5.2	6.2	4.7	5.1	4.4	6.0	0.9	0.2	0.4	-0.9	---	---	0
1I234A	**11/23/2013**	**840**	**0.07**	17.6	4.6	6.4	3.7	4.4	6.0	13.3	-1.4	2.1	-2.3	---	---	0
1I100	**1/18/2014**	**736**	**0.12**	6.5	7.7	3.6	3.2	4.4	6.0	2.2	1.7	-0.8	-2.8	---	---	0
1I246	**1/18/2014**	**680**	**0.15**	5.7	18.6	5.6	1.9	4.4	6.0	1.4	12.6	1.3	-4.1	5	0.167	40
DW-4	**2/25/2014**	**1400**	**0.11**	2730	10	153	3.5	4.4	6.0	2725.7	4.0	148.7	-2.5	Remediated		0
Ponds Area	**3/20/2014**	**1900**	**0.07**	---	---	---	---	4.4	6.0	---	---	---	---	---	---	---
1P026	**3/25/2014**	**6000**	**0.01**	---	---	---	---	4.4	6.0	---	---	---	---	---	---	---
1I182	**3/25/2014**	**600**	**0.03**	---	---	---	---	4.4	6.0	---	---	---	---	---	---	---
HH1-5 VS	**3/29/2014**	**10040**	**0.05**	19.2	2.1	6.3	1.7	4.4	6.0	14.9	-3.9	2.0	-4.3	0	0	0
1P026	**5/30/2014**	**900**	**0.01**	27.1	2	24.9	1.8	4.4	6.0	22.8	-4.0	20.6	-4.2	0	0	0
HH1-3 Line	**6/3/2014**	**57000**	**1.42**	6.3	3.7	7.7	1.5	4.4	6.0	2.0	-2.3	3.4	-4.5	0	0	0
1I306	**7/13/2014**	**1260**	**0.04**	3.6	1.7	2.9	1.8	4.4	6.0	-0.8	-4.3	-1.5	-4.2	0	0	0
1I166	**9/14/2014**	**370**	**0.02**	10.1	2.6	9.4	2.9	4.4	6.0	5.8	-3.4	5.1	-3.1	0	0	0
1I172	**11/20/2014**	**700**	**0.04**	7.1	7.5	5.9	3.6	4.4	6.0	2.8	1.5	1.6	-2.4	0	0	0
HH1-7	**12/12/2014**	**5520**	**0.245**	7.8	2.5	8.9	2.2	4.4	6.0	3.5	-3.5	4.6	-3.8	0	0	0
1I304	**12/12/2014**	**2835**	**0.245**	5.7	5.6	8.1	3.7	4.4	6.0	1.4	-0.4	3.8	-2.3	0	0	0
1I256P	**12/16/2014**	**900**	**0.12**	17.9	66.5	17.8	6	4.4	6.0	13.6	60.5	13.5	0.0	5	0.167	32
1I402	**1/13/2015**	**817**	**0.16**	8.4	3.3	5.2	2.4	4.4	6.0	4.1	-2.7	0.9	-3.6	0	0	0
DW-WW Line	**3/5/2015**	**13395**	**0.09**	9.3	2.1	7.4	2	4.4	6.0	5.0	-3.9	3.1	-4.0	0	0	0
HH1-8 Trunk	**3/11/2015**	**813**	**0.15**	4.8	3.5	2.4	2.5	4.4	6.0	0.5	-2.5	-2.0	-3.5	0	0	0
1I060	**4/8/2015**	**960**	**0.04**	8.4	2.5	9.9	4.5	4.4	6.0	4.1	-3.5	5.6	-1.5	0	0	0
HH1-11 Trunk	**10/17/2015**	**139**	**0.03**	2.1	1.6	3	1.3	4.4	6.0	-2.3	-4.4	-1.4	-4.7	0	0	0
DW-3	12/15/2015	20	0.002	156	7.5	57.3	9.8	4.4	6.0	151.7	1.5	53.0	3.8	Remediated		0
1P237A	6/13/2016	103	0.06	9.5	10.8	10.6	10.3	4.4	6.0	5.2	4.8	6.3	4.3	15	0.5	48
HH1-10 VS	**7/20/2016**	**12390**	**0.0**	---	---	---	---	4.4	6.0	---	---	---	---	0	0	0
HH1-5	**12/22/2016**	**582**	**0.07**	2	1.1	3	1.8	4.4	6.0	-2.4	-4.9	-1.4	-4.2	0	0	0
1I365	**1/9/2017**	**3654**	**0.21**	5.3	33.9	5.1	12.9	4.4	6.0	1.0	27.9	0.7	6.9	15	0.5	169
1I256P	2/3/2017	314	0.13	31.3	65.8	3.3	34.6	4.4	6.0	27.0	59.8	-1.0	28.6	15	0.5	105
HH1-8 VS	**2/6/2017**	**0 (3200)**	**0.0**	6.0	5.0	ND(1)	2.9	4.4	6.0	1.7	-1.0	---	-3.1	0	0	0
HH1-6 VS	4/3/2017	188		7.0	3.1	7	2.1	4.4	6.0	2.7	-2.9	2.7	-3.9	0	0	0
1P299A(I)	5/5/2017	137	0.01	18.8	37.4	3.3	9.8	4.4	6.0	14.5	31.4	-1.1	3.8	15	0.5	8
1I407	**5/22/2017**	**1100**	**0.02**	5.9	16.6	7.0	4.8	4.4	6.0	1.5	10.6	2.6	-1.2	5	0.167	5
1I630A	5/22/2017	48	0.003	2.1	14.4	2.4	14.3	4.4	6.0	-2.2	8.4	-1.9	8.3	15	0.5	2
1I425	5/24/2017	62	0.001	8.2	79.4	8.2	248	4.4	6.0	3.9	73.4	3.9	242.0	15	0.5	1
1I588	5/24/2017	26	0.001	2.2	1.6	1.9	2.4	4.4	6.0	-2.2	-4.4	-2.5	-3.6	0	0	0
DDW-4	8/1/2017	347	0.02	59	4.2	22	0.9	4.4	6.0	54.7	-1.8	17.7	-5.1	0	0	0
1I477	8/5/2017	67	0.01	3.0	3.6	3.0	6.6	4.4	6.0	-1.4	-2.4	-1.4	0.6	0	0	0
HH1-6	**8/18/2017**	**188000**	**0.55**	11	21	6	11.9	4.4	6.0	6.7	15.0	1.7	5.9	15	0.5	444
HH1-10	**9/5/2017**	**10000**	**0.84**	3	8.2	3	9.6	4.4	6.0	-1.4	2.2	-1.4	3.6	15	0.5	678
HH2-2 VS	10/3/2017	40	0.001	57.7	1.1	22.5	3.5	4.4	6.0	53.4	-4.9	18.2	-2.5	0	0	0
1I291	12/28/2017	23	0.05	Pend	Pend	Pend	Pend	4.4	6.0	Pend	Pend	Pend	Pend	---	---	---
								*Average of values from TR Table 2.9-1							Total:	1533

ATTACHMENT A: Spill Cleanup Summary
Lost Creek ISR Project
SUA-1598

Spill Soil Removal per CY

Equipment

Backhoe

$788 / week × 1 week / 5 days × 1 days / 889 cy = $ 0.18

Fuel

$10.07 / hour × 8 hrs / 1 day × 1 days / 889 cy = $ 0.09

Labor

Backhoe Operation

$27.64 / man hr × 8 man hrs / 1 day × 1 days / 889 cy = $ 0.25

SPILL REMOVAL $ PER CY OF SOIL =$ 0.52

Spill Reclamation *[MISC REC Tab]*

Soil Sampling and Monitoring		
Number of Soil Samples	(1 sample per spill per 200 cy)	14
$/Sample		$93
Subtotal Soil Sampling and Monitoring Costs		$1,302
Removal and Loading		
Volume of Soil (cy)		1533
Soil Removal and Loading Unit Cost ($/cy)		0.52
Subtotal Liner Removal and Loading Costs		$797
Transportation and Disposal		
Volume of Soil (cy)		1,533
Transportation and Disposal Unit Cost ($/cy) *[T&D Tab]*		$260
Subtotal Liner Transportation and Disposal Costs		$398,963
Subtotal Spill Reclamation Costs		**$401,062**
29% Contingency		$116,308
TOTAL		$517,370