

February 28, 2013

Attn: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Mr. Drew Persinko, Deputy Director  
Decommissioning & Uranium Recovery Licensing Directorate  
Division of Waste Management & Environmental Protection  
Office of Federal and State Materials &  
Environmental Management Programs  
Mailstop T8-F5  
Washington, DC 20555-0001

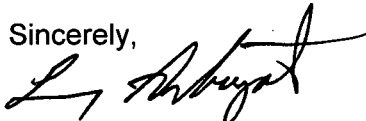
**Subject: License SUA-1314, Docket No. 40-8502  
Willow Creek Project  
Semi-Annual Effluent and Environmental Monitoring Report**

Dear Mr. Persinko:

In accordance with 10 CFR 40.65 and per license conditions 12.1 and 12.6 of Source Materials License SUA-1341, please find enclosed the Semi-Annual Effluent and Environmental Monitoring Report for the period of July 1 through December 31, 2012.

Please contact me should you have any questions regarding this report. (307) 464-1427

Sincerely,



Larry Arbogast  
Radiation Safety Officer

cc: Bill Kearney  
Tim McCullough  
Scott Schierman

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**Uranium One USA, Inc.**  
**Irigaray and Christensen Ranch Projects**

**2012 SEMI-ANNUAL EFFLUENT AND MONITORING REPORT (NRC)**

**INTRODUCTION**

In accordance with Sections 12.1 and 12.6 of the Nuclear Regulatory Commission (NRC) Source License No. SUA-1341, Uranium One USA, Inc. hereby submits the 2012 Semi-Annual Effluent and Monitoring Report. This document summarizes the required operational and environmental monitoring conducted at the Irigaray (IR) and Christensen Ranch (CR) projects from July 1, 2012 through December 31, 2012.

**1.0 Results from Employee Urinalyses.**

- 1.1** During the report period no bio-assay samples exceeded the 15 µg/l uranium action level. Samples are collected on a monthly basis from Plant operators, wellfield operators, laboratory personal, wellfield maintenance personal and Electricians at the Christensen Ranch Site. At the Irigaray Process Plant samples are collected on a monthly basis from the plant operators except during yellowcake drying operations, samples are collected once per shift every four days. Sample analysis is conducted by an outside laboratory. Review of the sample data shows that samples were submitted consistent with Reg. Guide 8.22 as referenced in license condition 10.12.

**2.0 OPERATIONAL MONITORING**

**2.1 Groundwater Volumes Injected and Recovered**

A total of 1,173,717,894 gallons was injected and 1,191,533,794 gallons was recovered during the report period.

**2.2 Injection Manifold Pressures**

Injection manifold pressures at the CR project are limited to 140 psi during wellfield operations and 168 psi during maintenance tasks, as per License Condition 11.1. License Condition 11.1 requires that the injection manifold pressures be recorded daily. Uranium One uses continuous chart recorders on the injection manifolds, which record pressure 24 hours per day. The results are tabulated in graphical format and retained as permanent record at the CR offices. There were two pressure exceedances of the 140 psi limit during the report period. The exceedances were in two module buildings in Mine Unit 8. They were caused by power bumps which Uranium One has no control of.

**3.0 ENVIRONMENTAL MONITORING**

**3.1 Regional Ranch Wells**

Quarterly groundwater samples were collected from five ranch wells near the CR project and

one ranch well near IR. The samples were analyzed for Uranium, Thorium-230, Radium-226, Lead-210 and Polonium-210. The resulting data are presented in Table 1 of Appendix 1. All analytical results for radionuclides were at or near minimum detection levels (MDL), which are consistent with historical data. Review of the analytical data indicates no upward trends were observed. Sampling was consistent with the requirements of License Condition 11.3 and Section 5.8 of the License Renewal Application.

### **3.2 Surface Water Monitoring**

Willow Creek is the only source of surface water present within and adjacent to the permit boundaries of both the IR and CR projects. Willow Creek is an ephemeral stream which was sampled on a quarterly basis. Three sample locations are designated at both project sites; upstream, downstream and within the permit boundary. The Powder River is also sampled annually at the Brubaker Ranch, which is approximately 4.5 miles downstream from its confluence with Willow Creek. Analytical data for both chemical and radionuclide parameters are provided in Table 2 of Appendix 1. All radionuclide data was at or near minimum detection levels, and no exceedances of NRC 10 CFR 20, Appendix B effluent limits occurred. Review of the analytical data does not indicate any upward trends for radionuclide or chemical parameter concentrations.

### **3.3 Spill and Leak Reports**

There were five spills during the reporting period of July 1 through December 31, 2012. Reports to the WDEQ and NRC were sent on these spills and will not be duplicated in this report.

### **3.4 Soil and Vegetation Sampling**

Annual soil and vegetation sampling results were included in the first half 2012 report and will not be added to the second half report.

## **4.0 Air Monitoring**

### **4.1 Radon Gas**

Radon gas is monitored continuously at six environmental air sampling locations at or near the Irigaray Project and at five locations at or near the Christensen Ranch Project. Passive outdoor radon detectors are exchanged and analyzed quarterly by Landauer, Inc., a NVLAP accredited company. The sample analyses data are given in Table 3. No trends or abnormal results were noted and all concentrations were well below the 10 CFR Parts 20, Appendix B effluent limit for radon of 1E-10uCi/ml.

### **4.2 Dryer Stack Emissions**

Uranium One resumed operation of the Yellowcake Dryer at the Irigaray Central Processing Plant on April 30, 2012. A Dryer Stack Emission test was performed on December 4, 2012 by Western Environmental Services and Testing Services. The test showed a release rate of 0.043 lb/hr, which demonstrates compliance with the allowable particulate emission rate of 0.30 lb/hr per the WDEQ Air Quality Permit OP 254. A summary of the total emissions released is in Table 8 of Appendix 1.

### **4.3 Airborne Radionuclide's**

During dryer operations, continuous airborne radionuclide sampling is required at the five specified environmental air sampling locations at the IR project. Results of this monitoring

data can be seen in Table 4 of Appendix 1. The yellowcake dryer was in operation from July 1, 2012 through the end of the report period.

#### **4.4 Gamma Radiation Monitoring**

Gamma radiation is monitored continuously at six environmental air locations surrounding the Irigaray Project and at five locations surrounding the Christensen Ranch Project. TLDs are exchanged and analyzed quarterly by Landauer Dosimetry Services, a NVLP accredited company. The environmental dosimeter data for the Irigaray and Christensen sites are presented in Table 5. No trends or abnormal results were noted.

#### **4.5 Public Dose**

Public dose determination is the off-shift operations personnel that utilize the man-camps for Irigaray and Christensen are used to demonstrate compliance with public dose limits, as these individuals have been identified as the member of the public likely to receive the highest dose from the Willow Creek Operations. The dose determination is located in Table 9 of Appendix 1.

### **5.0 OTHER INFORMATION REQUIRED BY SECTION 12.6 - NRC LICENSE**

#### **5.1 ALARA Audit**

The 2012 As Low As Reasonably Achievable (ALARA) audit was held on February 19, 2013 by Krista Wenzel (CHP). The ALARA report was not received at the time the 2<sup>nd</sup> Half Semi-Annual Effluent Report for 2012 was submitted. The ALARA report will be submitted under separate cover upon receipt.

#### **5.2 Land Use Survey**

The primary use of surrounding lands at both IR and CR projects continues to be rural sheep and cattle ranching. Livestock actively graze these lands, but fencing prevents access to the evaporation ponds, plant sites and wellfields.

The secondary use of surrounding lands continues to be petroleum production from wells dispersed throughout the region. The closest oil well at the CR project is located approximately one third of a mile west of the CR plant. The closest oil well at the IR site is located approximately one half mile east of the PU 9 wellfield. To our knowledge, no new oil wells have been drilled in close proximity to either project during 2012.

Over the past several years (2001 - 2012) some additional interest has developed in the immediate areas of the IR and CR projects in the development of coal bed methane (CBM) gas. Several CBM wells were drilled within a half-mile of CR MU 5 & 6 during 2012. At present these wells are in production.

The nearest residence to the IR site is 4 miles to the north (the Brubaker ranch) and the nearest residence to CR is the John Christensen ranch located 3 miles southeast of the CR plant site. Both are ranch housing with a population of 6 or less. One new residence has been added at the Christensen ranch site. This is the man camp for the CR operators to stay in during off shift hours.

### **5.3 Second Half of 2012 Site Inspections**

**5.3.1** During the report period no O.S.H.A. inspections were held.

**5.3.2** During the report period the NRC held two inspections. On September 11-13 and October 23, 2012. The purpose of the inspections was a follow up review of the pressurized yellowcake drum event that took place on June 23, 2012. A Confirmatory Action Letter (CAL) was issued by the NRC on July 5, 2012. After NRC review of Uranium One's corrective actions the (CAL) was closed by NRC as noted in letter dated December 5, 2012.

**5.3.3** Two inspections were held by the WDEQ during the report period. First on September 10, 2012 and on December 18, 2012. No violations were received.

### **5.4 Second Half 2012 SERP Summary**

Uranium One's Safety and Environmental Review Panel (SERP) [NRC License Condition 9.4 (C)] conducted one review during the second half of 2012. A summary of the SERPs is located in Table 7 of Appendix 1

### **5.5 Daily Walk –Through Inspections**

Daily walk – through inspections are conducted at the Irigaray and Christensen Ranch locations. A summary of the daily inspections by week are located in Table 6 of Appendix 1.

# **APPENDIX 1**

## **Data Tables 1-9**

# **APPENDIX 2**

## **ALARA AUDIT**



**Table 1**

Page 1 of 1

Uranium One USA, Inc. - Irigaray and Christensen Ranch Projects

2012 Semi-Annual Effluent Report

Sample Type: Regional Groundwater (Ranch Wells) -Quarterly Samples

Sample Location: Christensen Ranch House #3		
	2012	
	3rd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	9.6E-9 (µCi/ml)	1.1E-8 (µCi/ml)
Thorium-230	N/D	N/D
Radium-226	1.8E-9	1.5E-9 (µCi/ml)
Lead-210	N/D	1.5E-9 (µCi/ml)
Polonium-210	N/D	N/D

Sample Location: Christensen Middle Artesian		
	2012	
	3rd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	1.1E-8 (µCi/ml)	1.0E-8 (µCi/ml)
Thorium-230	N/D	N/D
Radium-226	4.0E-10 (µCi/ml)	3.0E-10 (µCi/ml)
Lead-210	2.6E-9 (µCi/ml)	2.7E-9 (µCi/ml)
Polonium-210	N/D	N/D

Sample Location: Christensen Ellendale #4		
	2012	
	3rd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	1.4E-9 (µCi/ml)	4.7E-10 (µCi/ml)
Thorium-230	N/D	N/D
Radium-226	4.0E-9 (µCi/ml)	3.0E-10 (µCi/ml)
Lead-210	N/D	2.6E-9
Polonium-210	N/D	N/D

Sample Location: Christensen Del Gulch Lower #13		
	2012	
	3rd quarter September 27, 2012	4th quarter November 8, 2012
Uranium	2.6E-09	3.0E-10
Thorium-230	N/D	N/D
Radium-226	4.0E-10	4.0E-10
Lead-210	1.9E-09	1.8E-09
Polonium-210	N/D	1.4E-09

Sample Location: Christensen Willow Corral #32		
	2012	
	3rd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	5.0E-10 (µCi/ml)	4.0E-10
Thorium-230	N/D	N/D
Radium-226	3E-10 (µCi/ml)	N/D
Lead-210	N/D	1.1E-9 (µCi/ml)
Polonium-210	N/D	N/D

Sample Location: Christensen First Artesian Well #1		
	2012	
	2nd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	3.0E-10 (µCi/ml)	3.0E-10 (µCi/ml)
Thorium-230	N/D	N/D
Radium-226	N/D	N/D
Lead-210	N/D	1.3E-9 (µCi/ml)
Polonium-210	N/D	N/D

Sample Location: Irigaray Willow # 2		
	2012	
	3rd quarter August 30, 2012	4th quarter November 8, 2012
Uranium	3.0E-10	N/D
Thorium-230	N/D	N/D
Radium-226	N/D	N/D
Lead-210	0.0	N/D
Polonium-210	N/D	N/D

**LLD's**

Uranium	2.0E-10 µCi/ml
Thorium-230	2.0E-10 µCi/ml
Radium-226	2.0E-10 µCi/ml
Lead-210	1.0E-9 µCi/ml
Polonium-210	1.0E-9 µCi/ml

N/D = NON DETECTABLE

**Table 2**  
**Uranium One USA, Irigaray and Chr:stensen Ranch Projects**  
**2012 Semi-Annual Effluent and Enviromental Monitoring Report**  
**Sample Type: Surface Water (Quaterly Samples)**

	Date	Uranium (µCi/ml)	Thorium 230 (µCi/ml)	Radium 226 (µCi/ml)	Lead 210 (µCi/ml)	Polonium 210 (µCi/ml)	Total Alkalinity (mg/L)	Chloride (mg/L)	TDS (mg/L)	Specific Conductivity (umhos/cm)	Sulfate (mg/L)	pH (s.u.)	Arsenic (mg/L)	Selenium (mg/L)	Estimated Flow Rate:
<b>Willow Creek IR-9 Downstream</b>	3RD Quarter 2012	No sample was taken - all dry													
	4TH Quarter 2012	No sample was taken - all dry													
<b>Willow Creek IR-14 Upstream</b>	3RD Quarter 2012														
	4TH Quarter 2012	No sample was taken - all dry													
<b>Willow Creek IR-17 Mine Site</b>	3RD Quarter 2012	No sample was taken - all dry													
	4TH Quarter 2012	No sample was taken - all dry													
LLD		2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	
	3RD Quarter 2012	No sample was taken - froze solid													
	4TH Quarter 2012	No sample was taken - froze solid													
		2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	
<b>Estimated Flow Rate:</b>															
Low = <5cfs															
Medium = 5 - 50 cfs															
High = > 50 cfs															
<b>(Sample is taken Annually)</b>															
		2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	

**Table 2**  
**Uranium One USA, Trigaray and Christensen Ranch Projects**  
**2012 Semi-Annual Effluent and Environmental Monitoring Report**  
**Sample Type: Surface Water (Quarterly Samples)**

		Date	Uranium (µCi/ml)	Thorium 230 (µCi/ml)	Radium 226 (µCi/ml)	Lead 210 (µCi/ml)	Polonium 210 (µCi/ml)	Total Alkalinity (mg/L)	Chloride (mg/L)	TDS (mg/L)	Specific Conductivity (µmhos/cm)	Sulfate (mg/L)	pH (s.u.)	Arsenic (mg/L)	Selenium (mg/L)	Estimated Flow Rate:
<b>Willow Creek GS-01 Downstream</b>		3rd Quarter 2012	No sample was taken - all dry													
		4th Quarter 2012	No sample was taken - all dry													
LLD			2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	
<b>Willow Creek CG-05 Upstream</b>		3rd Quarter 2012	No sample was taken - all dry													
		4th Quarter 2012	No sample was taken - all dry													
LLD			2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	
<b>Willow Creek GS-03 Mine Site</b>		3rd Quarter 2012	No sample was taken - all dry													
		4th Quarter 2012	No sample was taken - all dry													
LLD			2.0E-10	2.0E-10	2.0E-10	1.0E-09	1.0E-09	5	1	10	5	1	0.1	0.005	0.005	

**Estimated Flow Rate:**

Low = <5cfs

Medium = 5 - 50 cfs

High = > 50 cfs

**Table 3**

URANIUM ONE USA Inc. - Irigaray and Christensen Projects

2012 Semi-Annual Effluent and Monitoring Report

Sample Type: Environmental Radon Gas

<b>Location</b>	<b>1st Quarter 2012 uCi/ml</b>	<b>2nd Quarter 2012 uCi/ml</b>	<b>3rd Quarter 2012 uCi/ml</b>	<b>4th Quarter 2012 uCi/ml</b>	<b>Location Average 2012 uCi/ml</b>
<b>IRIGARAY PROJECT</b>					
IR-1 (Downwind of Restricted Area)	1.00E-09	4.00E-10	6.00E-10	1.00E-09	7.50E-10
IR-3 (Upwind of Restricted Area)	9.00E-10	9.00E-10	8.00E-10	1.00E-09	9.00E-10
IR-4 (North Road)	9.00E-10	9.00E-10	8.00E-10	1.00E-09	9.00E-10
IR-5 (Irigaray Ranch)	7.00E-10	5.00E-10	2.00E-10	8.00E-10	5.50E-10
IR-6 (Rigdge Road - S.E. - Background)	1.00E-09	9.00E-10	7.00E-10	1.00E-09	9.00E-10
IR-13 (IR Employee House Trailer)	9.00E-10	6.00E-10	9.00E-10	9.00E-10	8.25E-10
(IR-13 / nearest residence)	9.00E-10	6.00E-10	9.00E-10	9.00E-10	8.25E-10
<b>CHRISTENSEN PROJECT</b>					
AS-1 (Table Mountain - Background)	9.00E-10	4.00E-10	7.00E-10	9.00E-10	7.25E-10
AS-5A (CR Plant Upwind S.E.)	8.00E-10	7.00E-10	5.00E-10	3.00E-10	5.75E-10
AS-5B (CR Plant Downwind N.W)	4.00E-10	8.00E-10	7.00E-10	5.00E-10	6.00E-10
AS-6 (Christensen Ranch)	7.00E-10	9.00E-10	6.00E-10	1.00E-09	8.00E-10
AS-7 (CR Employee House Trailer)	7.00E-11	6.00E-10	7.00E-10	8.00E-10	5.43E-10
(AS-7 / nearest residence)	5.00E-10	6.00E-10	7.00E-10	8.00E-10	6.50E-10

LLD = 0.3 pCi/l

**Table 4**

URANIUM ONE USA, Inc. - Irigaray and Christensen Projects

2012 Semi-Annual Effluent and Monitoring Report

Sample Type: Environmental Air Particulate (3rd Quarter 2012)

Environmental Airborn Radionuclides (Weekly Composite) Start date 6/28/2012, End date 10/1/2012

	Uranium uCi/ml	Th-230 uCi/ml	Ra-226 uCi/ml	Pb-210 uCi/ml
IR-1 Downwind	6.60E-15	N/D	2.20E-16	2.40E-14
%of Pt, App. B Effluent Limit	0.34%		0.02%	4.00%
IR-3 Upwind	1.30E-14	1.10E-16	1.40E-16	2.60E-14
%of Pt, App. B Effluent Limit	0.67%	0.01%	0.02%	4.33%
IR-5 Brubaker Ranch	2.80E-15	N/D	2.90E-16	2.20E-14
%of Pt, App. B Effluent Limit	0.14%		0.03%	3.67%
IR-6 Background	2.50E-15	1.40E-16	3.90E-16	2.90E-14
%of Pt, App. B Effluent Limit	0.13%	0.01%	0.04%	4.83%
IR-13 Employee House Trailer	3.40E-15	1.10E-16	2.20E-16	1.60E-14
%of Pt, App. B Effluent Limit	0.17%	0.01%	0.02%	2.67%

N/D =Non Detectable

10 CFR Pt. 20, App. B, Effluent Limits (uCi/ml)

Uranium = 1.95E-12 (50%D &amp; 50%W)

Th-230 = 3.0E-14 (Y)

Ra-226 = 9.0E-13 (W)

Pb- 210 = 6.0E-13 (D)

Lab LLD's

Uranium = 1.0E--16

Th-230 = 1.0E-16

Ra-226 = 1.0E-16

Pb-210 = 2.0E-15

**Table 4**

URANIUM ONE USA, Inc. - Irigaray and Christensen Projects

2012 Semi-Annual Effluent and Monitoring Report

Sample Type: Environmental Air Particulate (4th Quarter 2012)

Environmental Airborn Radionuclides (Weekly Composite) Start date 10/1/2012, End date 1/2/2013

	Uranium uCi/ml	Th-230 uCi/ml	Ra-226 uCi/ml	Pb-210 uCi/ml
IR-1 Downwind	9.00E-15	2.40E-16	3.30E-16	7.80E-15
%of Pt, App. B Effluent Limit	0.46%	0.01%	0.04%	1.30%
IR-3 Upwind	9.50E-15	1.10E-16	2.70E-16	8.90E-15
%of Pt, App. B Effluent Limit	0.49%	0.01%	0.03%	1.48%
IR-5 Brubaker Ranch	3.10E-15	1.20E-16	2.40E-16	1.10E-14
%of Pt, App. B Effluent Limit	0.16%	0.01%	0.03%	1.83%
IR-6 Background	3.10E-15	1.60E-16	2.90E-16	1.10E-14
%of Pt, App. B Effluent Limit	0.16%	0.01%	0.03%	1.83%
IR-13 Employee House Trailer	5.10E-15	1.50E-16	3.40E-16	7.80E-15
%of Pt, App. B Effluent Limit	0.26%	0.01%	0.04%	1.30%

N/D =Non Detectable

10 CFR Pt. 20, App. B, Effluent Limits (uCi/ml)

Uranium = 1.95E-12 (50%D &amp; 50%W)

Th-230 = 3.0E-14 (Y)

Ra-226 = 9.0E-13 (W)

Pb-210 = 6.0E-13 (D)

Lab LLD's

Uranium = 1.0E--16

Th-230 = 1.0E-16

Ra-226 = 1.0E-16

Pb-210 = 2.0E-15

**Table 5**

URANIUM ONE USA, Inc. - Irigaray and Christensen Projects

2012 Semi-Annual Effluent and Monitoring Report

Sample Type: Environmental Gamma Radiation

Location	1st Quarter 2012 mrem/quarter	2nd Quarter 2012 mrem/quarter	3rd Quarter 2012 mrem/quarter	4th Quarter 2012 mrem/quarter	Location Average mrem/quarter
<b>IRIGARAY PROJECT</b>					
IR-1 (Downwind of Restricted Area)	5.9	11.5	10.9	11.3	9.9
IR-3 (Upwind of Restricted Area)	23.4	35.7	24	33.7	29.2
IR-4 (North Road)	5.8	8.3	8.8	8.7	7.9
IR-5 (Irigaray Ranch)	1.4	3.8	5.9	3.5	3.7
IR-6 (Ridge Road S.E. - Background)	5.7	10.2	7.6	10.9	8.6
IR-13 (I.R. Employee House Trailer) (nearest residence)	7.4	7.2	13.5	7.1	8.8
Quarterly Average	8.3	12.8	11.8	12.5	11.4
<b>CHRISTENSEN PROJECT</b>					
AS-1 (Table Mountain - Background)	7.2	6.4	9.7	6.3	7.4
AS-5A(CR Plant Upwind S.E. )	6.8	10.1	15.7	13.5	11.5
AS-5B (CR Plant Downwind N.W. )	6.6	10.1	9.2	9.4	8.8
AS-6 (Christensen Ranch )	9.2	13.5	14	12.3	12.3
AS-7 (C.R. Employee House Trailer) (nearest residence)	2.6	2.1	3.6	2	2.6
Quarterly Average	6.5	8.4	10.4	8.7	8.5

**Table 6**

URANIUM ONE USA, Inc. - Irigaray and Christensen Ranch Projects  
2012 Semi-Annual Effluent and Monitoring Report  
Summary of Daily Walk-through Inspections of Radiation Control Practices being implemented appropriately

Irigaray Site				Christensen Site			
Date: Week	YES	NO	COMMENTS	Date: Week	YES	NO	COMMENTS
7/1/2012	X			7/1/2012	X		
7/8/2012	X			7/8/2012	X		
7/15/2012	X			7/15/2012	X		
7/22/2012	X			7/22/2012	X		
7/29/2012	X			7/29/2012	X		
8/5/2012	X			8/5/2012	X		
8/12/2012	X			8/12/2012	X		
8/19/2012	X			8/19/2012	X		
8/26/2012	X			8/26/2012	X		
9/2/2012	X			9/2/2012	X		
9/9/2012	X			9/9/2012	X		
9/16/2012	X			9/16/2012	X		
9/23/2012	X			9/23/2012	X		
9/30/2012	X			9/30/2012	X		
10/7/2012	X			10/7/2012	X		
10/14/2012	X			10/14/2012	X		
10/21/2012	X			10/21/2012	X		
10/28/2012	X			10/28/2012	X		
11/4/2012	X			11/4/2012	X		
11/11/2012	X			11/11/2012	X		
11/18/2012	X			11/18/2012	X		
11/25/2012	X			11/25/2012	X		
12/2/2012	X			12/2/2012	X		
12/9/2012	X			12/9/2012	X		
12/16/2012	X			12/16/2012	X		
12/23/2012	X			12/23/2012	X		
12/30/2012	X			12/30/2012	X		



## Table 7

### Irigarary and Christensen Ranch Projects Summary of SERP Actions

Year	Description	Revisions to License Application Text
2012 SERP 12-01	The purpose of SERP 12-01 is to evaluate and approve the Northeast Area of Mine Unit 8, Modules 81 and 82 for operations. Pursuant to License Condition 9.4 as specified in Source Materials License SUA-1341, Amendment 20 dated August 2, 2011, Uranium One may evaluate and implement certain changes in licensed operations without applying for an amendment to the NRC license. In the case of a new wellfield, the SERP will follow Standard Operating Procedures PBL-1, "Performance Based Licensing – NRC License", Revision R4 dated November 3, 2010 and PBL-2, Performance-Based License Condition: Review and Evaluation of New Wellfields", Revision R3 dated November 3, 2010 as part of the review process for the proposed action.	None
2012 SERP 12-01A	The purpose of this evaluation by the Uranium One Safety and Environmental Review Panel (SERP) is to review and approve the Northwest and Southeast Area of Mine Unit 8, Modules 83, 84, 85, 86 and 88 for operations. Please note that the SERP for the Northeast Area of Mine Unit 8 was conducted on January 27, 2012 and WDEQ/LQD approval for this action was received on January 4, 2012. NRC approval to begin lixiviant injection in Mine Unit 8 was received on January 24, 2012.	None
2012 SERP 12-02	The purpose of this evaluation by the Uranium One Safety and Environmental Review Panel (SERP) is to review the proposed organizational structure changes for the Willow Creek Project as related to Radioactive Materials License SUA-1341.	Revised Section 5 Corporate Organization and Administrative Procedures pages 5-1 through 5-4a of the Approved License Renewal Application.  Revision to Figure 5-1 Organizational Chart page 5-4.

## Table 7

### Irigarary and Christensen Ranch Projects Summary of SERP Actions

2012 SERP 12-03	The purpose of SERP 12-03 is to evaluate and approve the resumption of wellfield (production) operations at Mine Unit 5, Module 52. Discussions were held with the Willow Creek, NRC Project Manager, Ron Litton in regards to the possibility of resuming production activities at Mine Unit 5 in September of 2011 and as recently as February 2012. NRC is in agreement that resumption of production activities in Mine Unit 5 is an action that can be conducted by the Willow Creek SERP Committee and would not require a License Amendment.	None
2012 SERP 12-04	The purpose of this evaluation by the Uranium One SERP is to review the test or experiment regarding the use of a pod filter bag system as a replacement to current sand filter system at the Christensen Ranch Satellite plant.	None
2012 SERP 12-05	The purpose of this evaluation by the Uranium One Safety and Environmental Review Panel (SERP) is to review the proposed organizational structure changes for the Willow Creek Project as related to Radioactive Materials License SUA-1341.	Revised Section 5 Corporate Organization and Administrative Procedures pages 5-1 through 5-3 of the Approved License Renewal Application.  Revision to Figure 5-1 Organizational Chart page 5-4.
2012 SERP12-06	The purpose of this evaluation by the Uranium One Safety and Environmental Review Panel (SERP) is to review and approve changes to operations resulting from the expansion to the Christensen Ranch Satellite Facility. Please note that the SERP for this action is that operations of the expansion is limited by SUA 1341, License Condition 10.5 until the NRC amendment allowing the flow to increase to 9000 gallons per minute (gpm) is received.	None. With the approval of flow increase amendment appropriate pages and figures in LRA have been submitted as part of the amendment request.

## Table 7

### Irigarary and Christensen Ranch Projects Summary of SERP Actions

2012 SERP12-07	VOID Not Conducted	None.
2012 SERP12-08	The purpose of SERP 12-01 is to evaluate and approve Mine Unit 10A, Modules 10-1and 10-2 for operations.	None.

**Table 8**

URANIUM ONE USA, Inc. - Irigaray and Christensen Projects  
 2012 Semi-Annual Effluent and Monitoring Report  
 Sample Type: Dryer Stack Emissions Test

**SUMMARY OF STACK EMISSIONS SURVEY RESULTS**  
**Irigaray Dryer and Packaging Circuit**

Survey month and year	Total Particulates lbs/hour (% limit)	U3O8 Emissions lbs / hour	Unat. Concentration uCi / ml	Th-230 Concentration uCi / ml	Ra-226 Concentration uCi / ml	Pb-210 Concentration uCi / ml
December 1994	0.074 (25%)	0.0047	3.06 E-10	6.7 E-13	7.75 E-13	2.33 E-12
March 1995	0.149 (50%)	0.0106	7.53 E-10	3.9 E-12	3.86 E-12	3.93 E-12
September 1995	0.167 (52%)	0.005	3.37 E-10	1.5 E-12	9.17 E-13	8.7 E-13
March 1996	0.056 (19%)	0.0041	2.92 E-10	1.13 E-12	1.51 E-13	1.13 E-12
September 1996	0.029 (10%)	0.0035	2.04 E-10	1.68 E-13	1.52 E-12	1.10 E-12
May 1997	0.057 (19%)	0.007	4.28 E-10	1.34 E-12	6.71 E-13	1.73 E-12
October 1997	0.065 (22%)	0.0123	6.80 E-10	1.88 E-12	1.86 E-12	4.23 E-13
May 1998	0.084 (28%)	0.0118	6.18 E-10	2.50 E-12	9.12 E-13	* NA
October 1998	0.035 (12%)	0.0063	3.08 E-10	1.21 E-12	1.54 E-12	2.94 E-11
June 1999	0.070 (23%)	0.0163	9.33 E-10	6.70 E-13	9.46 E-14	7.82 E-11
December 1999	0.014 (5%)	0.0107	6.67 E-10	9.01 E-14	1.53 E-13	2.73 E-12
May 2000	0.052 (17%)	0.0073	5.73 E-10	3.30 E-12	3.10 E-13	3.76 E-11
November 2001	0.071 (24%)	0.0082	6.36 E-10	< 1.42 E-12	< 6.51 E-13	< 4.35 E-13
January 2005	0.054 (18%)	0.0033	2.46E-10	1.19E-13	6.92E-14	2.91E-12
November 2011	0.041 (14%)	0.0087	8.80E-10	4.07E-12	2.37E-12	6.08E-11
June 2012	0.038 (13%)	0.0086	6.21E-10	<4.88E-10	<5.65E-10	4.09E-10
December 2012	0.043 (14%)	0.0041	2.41 E-10	4.69 E-13	3.46E-12	2.83E-11
	<b>Permit Limit 0.30</b>					

**COMMENTS:**

\* Pb-210 was not determined in May 98, because the sample was destroyed by the lab before the analysis was completed.

# 2012 EMPLOYEE MAN CAMP ENVIRONMENTAL RADON DOSE ASSIGNMENT

Table 9

IR-13 Irigaray Site					AS-7 Christensen Site				
QTR./YEAR	Man Camp Radon uCi/mL	Bkg uCi/mL	Net uCi/mL	Annual Dose Mrem	QTR./YEAR	Man Camp Radon uCi/mL	Bkg. uCi/mL	Net uCi/mL	Annual Dose Mrem
1st Qtr.	9.0E-10	1.2E-09	0.0E+00		1st Qtr.	5.0E-10	9.0E-10	0.0E+00	
2nd Qtr.	6.0E-10	4.0E-10	2.0E-10		2nd Qtr.	6.0E-10	4.0E-10	2.0E-10	
3rd Qtr.	9.0E-10	7.0E-10	2.0E-10		3rd Qtr.	7.0E-10	7.0E-10	0.0E+00	
4th Qtr.	9.0E-10	1.3E-09	0.0E+00		4th Qtr.	8.0E-10	9.0E-10	0.0E+00	
Yearly. Ave.	8.3E-10	9.0E-10	0.0E+00	0	Yearly. Ave.	5.4E-10	5.7E-10	0.0E+00	0
2012 TOTAL				0 mrem	2012 TOTAL				0

Background for Christensen Site is AS-1 (Table Mountain)

(Rn-222 dtrs present = 1 E-10 µCi/ml = 50 mr/yr)

Background for Irigaray is IR-6 (Ridge Road SE)

Dose assignment was based on 36 hours per week of offshift time spent in mancamp over a 13 week period per quarter. [36 hrs. X 13 weeks = 468 hours/quarter] [1872 hours/year]

Dose assessment concentrations in 10 CFR 20, Appendix B, Table 2 Effluent Concentrations are equivalent to a 50 mrem dose if inhaled or injected continuously over a period of 1 year

Therefore the following equation to determine potential dose at the mancamp is applicable

24 hr/d x 7 d/wk = 168 hr/wk

168 hr/wk x 52 wk/yr = 8736 hrs/yr

1872 hrs/yr at the mancamp in 2011 1872 hr/yr/8736 hrs/yr = 0.2143 x 100 = **21.43% of time spent as time receiving a Public Dose**

- (negative values) indicate = Non-Detectable (less than background)

# 2012 EMPLOYEE MAN CAMP TRAILER ENVIRONMENTAL GAMMA DOSE ASSIGNMENT

IR-13 Irigaray Site					AS-7 Christensen Site				
QTR./YEAR	Man Camp mR	Bkg mR	NET mR	ANNUAL DOSE Mrem	QTR./YEAR	Man Camp mR	Bkg mR	NET mR	ANNUAL DOSE Mrem
1st Qtr./2012	7.2	5.7	1.5		1st Qtr./2012	2.6	7.2	0.0	
2nd Qtr./2012	7.2	10.2	0.0		2nd Qtr./2012	2.1	6.4	0.0	
3rd Qtr./2012	13.5	7.6	5.9		3rd Qtr./2012	3.6	9.7	0.0	
4th Qtr./2012	7.1	10.9	0.0		4th Qtr./2012	2	6.3	0.0	
Yearly Ave.	8.8	8.6	0.2	0.2	Yearly Ave.	2.6	7.4	0.0	0
2012 TOTAL				0.2	2012 TOTAL				0

Background for Christensen site is AS-1 (Table Mountain) ,Background for the Irigaray site is IR-6 (Ridge Road)

Dose assignment was based on 36 hours per week spent in mancamp over a 13 week period per quarter. [36 hrs. X 13 weeks = 468 hours/quarter] [1872 hours/year]

N/D = Non-Detectable (less than background)

**2012 EMPLOYEE MAN CAMP PUBLIC ENVIRONMENTAL AIRBORNE RADIONUCLIDE DOSE ASSIGNMENT**

1st Quarter 2012		IR-13 Irigaray Site			2nd Quarter 2012		IR-13 Irigaray Site		
Sample Period	Radionuclide	Air Conc. uCi/mL	Bkg uCi/mL	Net uCi/mL	Sample Period	Radionuclide	Air Conc. uCi/mL	Bkg uCi/mL	Net uCi/mL
Dryer off, No sample	Unat			0.0E+00	4/26/12 thru 6/28/2012	Unat	3.5E-15	2.9E-15	6.0E-16
Dryer off, No sample	Th-230			0.0E+00	4/26/12 thru 6/28/2012	Th-230	1.5E-16	2.2E-16	0.0E+00
Dryer off, No sample	Ra-226			0.0E+00	4/26/12 thru 6/28/2012	Ra-226	2.2E-16	2.5E-16	0.0E+00
Dryer off, No sample	Pb-210			0.0E+00	4/26/12 thru 6/28/2012	Pb-210	1.6E-14	1.7E-14	0.0E+00

3rd Quarter 2012		IR-13 Irigaray Site			4th Quarter 2012		IR-13 Irigaray Site		
Sample Period	Radionuclide	Air Conc. uCi/mL	Bkg uCi/mL	Net uCi/mL	Sample Period	Radionuclide	Air Conc. uCi/mL	Bkg uCi/mL	Net uCi/mL
6/28/12 thru 10/1/2012	Unat	3.4E-15	2.5E-15	9.0E-16	10/1/12 thru 1/2/2013	Unat	5.1E-15	3.1E-15	2.0E-15
6/28/12 thru 10/1/2012	Th-230	1.1E-16	1.4E-16	0.0E+00	10/1/12 thru 1/2/2013	Th-230	1.5E-16	1.6E-16	0.E+00
6/28/12 thru 10/1/2012	Ra-226	2.2E-16	3.9E-16	0.0E+00	10/1/12 thru 1/2/2013	Ra-226	3.4E-16	2.9E-16	5.0E-17
6/28/12 thru 10/1/2012	Pb-210	1.6E-16	2.9E-14	0.0E+00	10/1/12 thru 1/2/2013	Pb-210	7.8E-15	1.1E-14	0.0E+00

2012 Conc uCi/ml	10 CFR Effluent Limit	% Effluent Conc.	DOSE Mrem
8.8E-16	2.0E-12	0.04	0.01
0.0E+00	3.0E-14	0.00	0.00
1.3E-17	9.0E-13	0.00	0.00
0.0E+00	6.0E-13	0.00	0.00
<b>2012 TOTAL</b>			<b>0.01</b>

There is no environmental airborne radionuclide sampling performed at the Christensen Satellite Facility as only release is radon.

Dose in the above table is shown as 100% of time as Public Dose exposure. Being used to demonstrate compliance with 40 CFR 190 limit of 10 mrem excluding radon.

When in actuality time spent at man camp as member of Public is as follows:

Dose assignment was based on 36 hours per week of offshift time spent in mancamp over a 13 week period per quarter. [36 hrs. X 13 weeks = 468 hours/quarter] [1872 hours/year]

Dryer Operations were performed during the 2nd, 3rd and 4th Quarters in 2012.