

# UNITED NUCLEAR CORPORATION



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January 30, 2014

Mr. Jack E. Whitten, Chief  
US Nuclear Regulatory Commission, Region IV  
Division of Nuclear Materials Safety Branch B  
612 East Lamar Blvd, Suite 400  
Arlington, TX 76011-4125

Dear Mr. Whitten:

Pursuant to our License SUA-1475, submitted herewith are the results of our Annual ALARA Audit conducted on December 16, 2013.

If you have any questions, please advise.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Bush", written over a white rectangular area.

Larry Bush  
Manager

Cc: Joe Davis, GE  
Roy Blickwedel, GE  
Andrew Persinko, USNRC  
Yolande Norman, US NRC

Docket No. 040-08907



To: File January 30, 2014

From: Max Chischilly Jr., RSO

Subject: ALARA Committee Meeting and Audit conducted on December 16, 2013

The UNC Mining and Milling ALARA Committee met on December 16, 2013 to audit the result of the radiological monitoring program for the fourth quarter of 2012 and the first three quarters of data for 2013. Current committee members are: Larry Bush, Manager, and Max Chischilly Jr., Radiation Safety Officer. The Committee reviewed Mr. Chischilly's Annual Report entitled "Environmental and Personnel Monitoring Program for Inactive Status Report from 4<sup>th</sup> Qr. 2012 to 3<sup>rd</sup> Qr. 2013.

Significant Finding and Event:

1. No radiation exposure was recorded for United Nuclear Corp. (UNC) employees, contractors, and the public due to our current site status conditions.
2. Training and refresher training of employees on radiation protection and safety was done in 2013 as required.
3. All documentation and monitoring required by our radiation protection program and NRC License was in order for 2013.
4. Available GW-3 well data for this Report is also reported as per suggested format in Regulatory Guide 4.14 (see attached Table-1 on pg. 8 of 8).
5. The annual land use survey was done on 3-27-13 for 2012 (see report for findings).
6. The environmental monitoring program is limited and the reported items in the Environmental Monitoring Summary Data (pg. 4 of 8) are solely based on available data. The only required radiation-monitoring program will be under an RWP (Radiation Work Permit), in pg. 5 of 8 of this report.
7. The active radiation monitoring instruments are routinely calibrated and the Personnel Radiation Monitoring program under RWP is still in effect, but is in a standby status awaiting the final pond closure reclamation activity (see also pg. 5 of 8).



8. Continual monthly and/or quarterly monitoring is ongoing for well NBL-1, NBL-2, PB-2, PB-3, PB-4, RW-A and NW well series (1 thru 5), well MW-6 and MW-7 to track the northern most migration extent of the seepage impacted water or plume in Zone 3. As of April 11, 2013 well NBL-1 is no longer monitored for monthly plume and quarterly performance due to the well going dry.
9. Continual pumping/extraction is ongoing in the Zone 3 seepage impacted water area for well RW-11, RW-16, RW- 17, RW-A, PB-2, NW-2 and NW-4. The pumped water is discharged into the tailings North Evaporation Pond. Also, well PB-2 pumping was discontinued on August 13, 2013 due to decreasing water volume and producing only 0.007 gallons per minute.
10. Mr. Robert Evans (NRC Inspector) identified no violations or deviations on a routine NRC inspection conducted on July 18, 2013.
11. In compliance to NRC Source Material License NO. SUA-1475, condition no. 21 a Radiation Work Permit (RWP) was issued November 4, 2013 to address radiation protection on non-routine field activities on mill tailings impoundment during the Northeast Church Rock Mine Site Removal Action Pre-Design Studies (PDS) Sampling and Analysis Plan project. This RWP supplemented a Radiation Protection Plan (Appendix A to Health and Safety Plan) prepared by MWH October 25, 2013. Final summary on high radiological monitoring results will be reported during the next Annual Alara Audit since some results are still pending at this reporting period (see pg. 6 of 8 and 7 of 8 for available data).
12. Based on the routine annual ALARA committee meeting and audit on December 16, 2013; the program has met the requirement under 10 CFR Part 20, Subpart G -- Radiation Protection Programs, Sec. 20.1101 ( c ).



Past Significant Events:

1. The Mill Site was released from a restricted to unrestricted area by License # SUA-1475 Amendment # 21 in 1995.
2. The final tailings reclamation was completed in 1995. The last of the drainage channels were completed in 1996. The reclamation of evaporation ponds is being delayed until the ground water Corrective Action Plan is deemed completed by the NRC and EPA.
3. The radon cap covers was completed in 1996 with exception of the lined evaporation ponds.
4. The report submitted January 03, 1997 and on January 13, 1998 on Radon Emanation Testing of UNC's Church Rock Tailings Site shows the average Radon Flux to be 5.67 pci/m<sup>2</sup>sec., which is less than the allowable of 20.0 pci/m<sup>2</sup>sec.



UNC MINING AND MILLING  
ENVIRONMENTAL SURVEILLANCE

Monitoring Program

- \* 1. The Radiation Safety Officer (RSO) inspects the restricted areas monthly.
- \* 2. Air sampling is continuously done at four locations; one located upwind of the tailings impoundment, two located downwind of the tailings impoundment, and one background sampling location (see EMP-2).
- \* 3. Gamma exposure is continuously monitored with TLDs at the same four locations as the air sampling. The TLDs are changed out and analyzed semi-annually (See Procedure EMP-3).
- \* 4. Ambient radon is continuously monitored with radon detectors at the same sites as air sampling. The detectors are changed out and analyzed quarterly and reported semi-annually (see Procedure EMP-4).
- \* 5. Groundwater samples are collected and analyzed quarterly at two locations near tailings, and one domestic water well at the mill site (see Procedures EMP-5 and EMP-5a).
- 6. Equipment being sold or for other purposes, leaving the restricted area is surveyed for compliance with guidelines for release to unrestricted use (see Procedure EMP-8A).
- \* 7. An Effluent Report will be submitted semi-annually within 60 days of each six-month period. All of the Environmental Monitoring Program data is included in this report, with the exception of the equipment surveys (see EMP-9).

Note: The above (\*) marked items are deleted as per NRC approved License amendment 29 dated 6-18-99 deleting condition's #16, #22, and #28.

Additional Note: Item #1 procedure is continued on 10-19-99, to show and maintain the integrity of the restricted tailings area. Effluent Report under Item #7 is reported when pertinent data is available.

*Max Chisnelly Jr. 1/19/11 Max Chisnelly Jr. 1/20/12 Max Chisnelly Jr. 1/17/09 Max Chisnelly Jr. 1/9/10*  
*Max Chisnelly Jr. 1/28/02 Max Chisnelly Jr. 1-20-03 Max Chisnelly Jr. 1/17/05*  
*Max Chisnelly Jr. 1/29/01 M. Chisnelly 1/22/99 Max Chisnelly Jr. 1/24/06*  
*Max Chisnelly Jr. 1/20/00 Max Chisnelly Jr. 1-20-04 Max Chisnelly Jr. 1/25/07*  
*Max Chisnelly Jr. 1/21/13 E. M. ... 1/22/11 Max Chisnelly Jr. 1/28/08*  
*E. M. ... 1/19/95 E. M. ... 1/22/98 Max Chisnelly Jr. 1/23/14*



UNC MINING AND MILLING  
PERSONNEL RADIATION PROTECTION PROGRAM

External Exposure Monitoring

1. Employees working within the tailings area wear a TLD badge which is changed out and analyzed semi-annually. (See Procedure PMP-2).

Internal Exposure Monitoring

2. Self-monitoring Alpha survey is done by employees working within the tailings area daily prior to leaving the area with occasional spot checks by the RSO or the Radiation Technician (see Procedure PMP-4).
3. Bioassays are done on employees working within the tailings area semi-annually (See Procedure PMP-5).
4. Continuous air samples are taken in the general tailings working area of employees for the purpose of calculating exposures (see Procedure PMP-6).
5. Surface surveys of eating areas, change room benches, and labs are done monthly.
6. TLD, bioassays and air samples will also be done under the RWP program (see Procedure PMP-9).
7. Instrumentation and calibration (see Procedure PMP-10).

\*NOTE Rev. 4, PMP

Personnel Radiation Monitoring, 1 through 6, to be done as needed under an RWP.

*May Chisnelly, Jr. 1/9/10*  
*May Chisnelly, Jr. 1/7/09*  
*May Chisnelly, Jr. 1/28/08*  
*E. Mearns*  
*1/19/95*  
  
*1/20/96* *E. Mearns*  
*May Chisnelly, Jr. 1/23/14*  
  
*May Chisnelly, Jr. 1/19/11*  
*May Chisnelly, Jr. 1/25/07*  
*ED Mearns*  
*1/20/97*  
  
*1/22/98* *E. Mearns*  
*May Chisnelly, Jr. 1/20/12*  
*May Chisnelly, Jr. 1/21/13*  
  
*May Chisnelly, Jr. 1/24/06*  
*May Chisnelly, Jr. 1/17/05*  
*M. Chisnelly 1/22/99*  
*May Chisnelly 1/20/00*  
  
*May Chisnelly 1/29/01*  
*May Chisnelly, Jr. 1/28/02*  
*May Chisnelly, Jr. 1/20/03*  
*May Chisnelly, Jr. 1-20-04*



ENVIRONMENTAL MONITORING SUMMARY DATA  
FROM 4TH QUARTER 2012 TO 3RD QUARTER 2013

Environmental Monitoring	Required Analysis:	Highest Result Obtained:	Allowable:
1. Quarterly Ground Water GW-Wells: (NOTE: Available data is on GW-3 well)	U-Nat (mg/l)	0.311 (dissolved or total)	0.30 (NRC) 5.0 (EPA)
	TH-230 (pci/1)	0.10 (dissolved or total)	5.0 (NRC)
	RA-226 (pci/1)	0.140 (dissolved or total)	5.0 with RA-228 (NRC & EPA)
	PB-210 (pci/1)	0.90 (dissolved or total)	1.0 (NRC)
	PH (units)	6.44 (lowest)	6-9 (NMED)
2. Surface Alpha and Gamma: ( NOTE: Release Alpha limit during the RWP Project was a. 20 dpm/100 cm2 (removable) b. 100 dpm/100 cm2 (Fixed avg) for material, equipment and personnel)	Any Material or Equipment released, will meet the requirements for unrestricted use		a. Removable is 1000 dpm/100 cm2 b. Fixed Average is 5000 dpm/100 cm2 where area is no greater than 1m2 c. Gamma is 40 ur/hr
*3. Grab Air Sample	Gross Alpha (uci/ml)	9.40 E-15 (Downwind)	
*4. Area TLD	Gamma (mrem/yr.)	5.7 (Downwind)	25 (clean-up Std.) 100 (TEDE Annual Limit)

\*Note: Item #3 and #4 were re-implemented under RWP to Pre-Design Studies (PDS) project on 11-4-13.

5. Monthly Inspection Findings:

a. Break in had occurred on 9-6-13 into the tailing area by individuals salvaging for metal / aluminum items during after hours (small misc. uncontaminated steel fittings were taken from the pond storage shack). Local law enforcement officer investigated the incident and entry was gained by cutting a chained lock which was immediately replaced.

b. Perimeter fence line repair work was done on 9-12-13 after an evening flood event on 9-10-13. Continual surveillance is on going to keep out livestock and unauthorized entry.

c. All other months checked OK.



PERSONNEL MONITORING SUMMARY DATA  
FROM 4TH QUARTER 2012 TO 3RD QUARTER 2013

Personnel Monitoring Items:	Required Analysis:	Highest Result Obtained:	Allowable:
1. Semi-Annual or as Needed personnel TLD (DDE)	Gamma (rem/yr)	Pending	0.500 (Action Level)
2. Semi-annual or as needed bioassay	Total Uranium (ug/l)	< 5 (see below)	15-35 (Action Level)
3. Grab Air sample	Gross Alpha (uci/l)	1.23 E-13 (Field)	6E-11 (DAC)
(Also note: Action level is 10% of an applicable dose limit)	TH-230 (uci/ml)		6E-12 (DAC)
	RA-226 (uci/ml)		3E-10 (DAC)
	PB-210 (uci/ml)		1E-10 (DAC)
	RN-222 (uci/ml) (-Daughter)	Pending	4E-6 (DAC)
	U-Nat (uci/ml)		2E-11(DAC)

Personnel Exposure:

4. Estimated Annual Total Effective Dose Equivalent (TEDE):	TEDE (rem)	Pending	5.0 (MAX.)
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NOTE: The above items are only required under an RWP as needed (see PMP, Rev. 4 on Page 5 of 8). All Field workers entry and exist bioassay urinalysis results are not detected (ND) at the reporting limit (5 ug/l), and lab workers exit results are still pending due to incomplete job task at this reporting period.



# TABLE -- 1

## QUARTERLY LIQUID SAMPLES

Date/Qu.	Location	Type	Radionuclide	Concentration		Error Est.	LLD
				Mg/l	µci/ml		
4th-Qu. 2012	GW-3	Ground	U-Nat (dissolved) or total		2.11E-07		2.00E-10
to 3rd-Qu. 2013		Water Well	Th-230 (dissolved) or total		1.00E-10	1.00E-10	2.00E-10
<u>Highest Result</u>							
UNC Field Data:							
			PH (STD. Units) = 6.44				
			Cond. (µ MHOS) = 5,220				
			Water Depth (Ft.) = 54.82				
			Temp. (°C) = 19.6				
			Ra-266 (dissolved) or total		1.40E-10	9.00E-11	2.00E-10
			Pb-210 (dissolved) or total		9.00E-10	8.00E-10	1.00E-09
			Po-210 (dissolved) or total		Not Monitored		1.00E-09

COMMENTS:

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