

40-8907

# UNITED NUCLEAR CORPORATION



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January 27, 2005

Mr. Gary Jonosko  
US Nuclear Regulatory Commission  
Fuel Cycle Safety & Safeguards  
Fuel Cycle Licensing Branch  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety & Safeguards  
11545 Rockville Pike  
Rockville, Maryland 20852-2738

Dear Mr. Jonosko:

Pursuant to our License SUA-1475, submitted herewith are the results of our ALARA Audit conducted on December 13, 2004.

If you have any questions, please advise.

Sincerely,

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

Larry Bush  
Manager

LB;drb

Cc: US NRC, Region IV Div. Of Radiation Safety and Safeguards  
Steve Hill, GE  
Roy Blickwedel, GE

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January 27, 2005

Mr. Jack Whitten, Chief  
US Nuclear Regulatory Commission  
Division of Radiation Safety & Safeguards  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011-4351

Dear Mr. Whitten:

Pursuant to our License SUA-1475, submitted herewith are the result of our ALARA Audit conducted on December 13, 2004.

If you have any questions, please advice.

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January 27, 2005

To: File

From: Larry Bush

Subject: ALARA Committee Meeting and Audit, December 13, 2004

The UNC Mining and Milling ALARA Committee met on December 13, 2004 to audit the result of the radiological monitoring program for the fourth quarter of 2003, and the first three quarters of data for 2004. Current Committee members are: Larry Bush, Manager, and Max Chischilly Jr., Radiation Safety Officer. The Committee reviewed Mr. Chischilly's Annual Report entitled "Environmental Monitoring Program for Inactive Status 2004," dated December 2004, and "Data Summary between the fourth quarter of 2003 to the first three quarters of 2004."

## Current Significant Findings 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 2004 as required.
3. All documentation required by our monitoring program is in order for 2004.
4. Available data for this Report is also reported as per suggested format in Regulatory Guide 4.14 (see attached Table-1).
5. The Annual landuse survey was done on 3/01/04 for 2003. Findings Include:

- 5.1 Residential homesites had increased from nine to ten on Section 10 (Indian Allotted) and from 21 to 23 on the northwest portion of the 2 mile radius (Navajo Reservation).
- 5.2 After interviewing local residents, the Circle Wash well located on Sec. 14 (Indian Allotted) is still used for livestock and domestic.
- 5.3 On 3/27/03; relocated and reposted the radioactive material caution/ warning signs from the reclaimed tailings perimeter fence line (overall total of thirty; one meter unshielded gamma ray exposure rate reading averaged 17.53  $\mu\text{r/hr}$ . near or where the rad signs were formerly posted) to the tailings interior perimeter evaporation pond and material storage area (overall total of eighteen; one meter unshielded gamma ray exposure rate reading averaged 32.17  $\mu\text{r/hr}$ . where the rad signs are now posted). Tailings perimeter fence line area is still restricted with locked gates and no trespassing signs posted.
- 5.4 From 6/09/03 to 7/31/03, four Zone 3 area test wells were drilled and installed on UNC's Sec. 36, T.17N., R.16W., NMPM. Well description and purpose is listed below:
- Test boring well and later plugged (CHHF-1).
  - Test boring and observation well (CHHF-2).
  - Pilot test and fracture well (HF-3).
  - Test boring and observation well (MWHF-3).

The above task was performed as part of UNC's exploratory studies to evaluate methods to enhance the extraction potential within the impacted area of this hydrostratigraphic unit and to prevent the seepage from migrating off site (MACTEC, December 2003).

- 5.5 On 8/18/03; two contracted fenceline workers commenced the task of replacing the tailings perimeter old existing barb wire fenceline with new 47" field fence, 7 ' steel t-post and barb wire. Replacement started approximately 900' westerly from SW Section 36 Corner, to the NE Section 2 Corner, to the SE Section 2 Corner, and end approximately 450' westerly from the SE Section 2 Corner. This project also included retightening and restrengthening the entire south perimeter fenceline and other task as needed. The project was under taken to further enhance the prevention of livestock entry into the reclaimed tailings area, and all fenceline replacement and repair work as well as other needed task was completed on 12/19/03.
- 5.6 A minor flood event had occurred on 7/31/03 and a major event had occurred on 9/09/03 which damaged and downed the newly installed fenceline in the northern portion of tailings perimeter. However, replacement and repair work was done as soon as possible.
- 5.7 Other past event, as part of the PB Well Project (on UNC's Section 36) include the drilling/installment and plugging of the well MWHC-1 on 6/26/02. This well was geophysically logged and core sample studied.
6. Presently, our environmental monitoring program is at a greatly reduced level and the reported items in the Environmental Monitoring Summary Data (pg. 8 of 10) are solely based on the available data only. The only required radiation monitoring program will be under an RWP (Radiation Work Permit), and no RWP was issued during this annual period.
7. The active radiation monitoring instruments are routinely calibrated and 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. 7 of 10).

8. From 6/8/04 to 7/21/04, sixteen Zone 3 area test wells and one Southwest Alluvium Monitor well were drilled and installed on UNC's Sec. 36 and 2; T.17N., R.16W., NMPM and Indian Allotted land on Section 10, T.16N., R.16W., NMPM. Well description and purpose are listed below.
  - Test boring well and later plugged (RW-11C to RW-17C).
  - Pilot test, fracture and extraction well (RW-11 to RW-17).
  - Zone 3 piezometer and plume monitoring well (Z3M-1 and Z3M-2)
  - Southwest Alluvium monitor well (SBL-1)

The above RW wells are part of an on going, extended pilot program to evaluate the use of hydrofracturing as a way to enhance the remedy for cut off and containment of the migrating Zone 3 seepage impact water.

9. Continual monthly monitoring on well NBL-1, 504-B, PB-2, PB-3, and PB-4 to track and locate the northern most migration extent of the seepage impacted water or plume in Zone 3.

Past Significant Events:

1. The mill site was release from our license SUA-1475 as a restricted area by Amendment # 21 in 1995.
2. The final tailings reclamation was completed in 1995. The last of 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 the 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 5.71 pci/m<sup>2</sup>sec., which is less than the allowable of 20.0 pci/m<sup>2</sup>sec.

EMP  
Rev. 2

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 Chischilly Jr. 1/28/02. Max Chischilly Jr. 1-20-03 Max Chischilly Jr. 1/17/05*

*Max Chischilly Jr. 1/29/01 M. Chischilly 1/22/99*

*Max Chischilly Jr. 1/20/00 Max Chischilly Jr. 1-20-04*

*E. Marks 1/19/95 E. Marks 1/20/97*

*E. Marks 1/20/96 E. Marks 1/22/98*

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.

*E. Muecke*  
1/19/95

*ED Muecke*  
1/20/97

1/20/96 *E. Muecke* 1/22/98 *E. Muecke*

*May Chinchilly J.* 1/17/05

*M. Chinchilly* 1/22/99

*May Chinchilly* 1/20/00

*May Chinchilly* 1/29/01

*May Chinchilly J.* 1/28/02

*May Chinchilly J.* 1/20/03

*May Chinchilly J.* 1-20-04

**ENVIRONMENTAL MONITORING SUMMARY DATA  
FOR 4<sup>TH</sup> - QUARTER 2003 TO 3<sup>RD</sup> - QUARTER 2004**

<b>Environmental Monitoring:</b>	<b>Required Analysis:</b>	<b>Highest Result Obtained:</b>	<b>Allowable:</b>
1. Quarterly Ground Water GW-Well: (NOTE: Available data is on GW-3 Well)	U-Nat ( $\frac{\text{mg}}{\text{l}}$ )	0.104 (dissolved or total)	0.30 (NRC) 5.0 (EPA)
	Th-230 ( $\frac{\text{pci}}{\text{l}}$ )	0.20 (dissolved or total)	5.0 (NRC)
	RA-226 ( $\frac{\text{pci}}{\text{l}}$ )	0.30 (dissolved or total)	5.0 with RA-228 (NRC & EPA)
	PB-210 ( $\frac{\text{pci}}{\text{l}}$ )	1.0 (dissolved or total)	1.0 (NRC)
	PH (units)	6.81	6 - 9 (NMED)
2. Surface Alpha:	All Materials or Equipment released, will meet the requirements for unrestricted use.		Removable is $1000 \frac{\text{dpm}}{100 \text{ cm}^2}$  Fixed Average is $5000 \frac{\text{dpm}}{100 \text{ cm}^2}$  where area is not greater than $1\text{m}^2$  Gamma is 40 ur/hr
3. Monthly Inspection:	Livestock entry into the reclaimed tailings area, had occurred on 9-24-04. Access was gained by the bulls damaging and forcing an opening in the fenceline. One radiation warning sign was blown off the metal post by high winds on 4-30-04. Immediate corrective action was taken to remediate these problems which include the repairing of fenceline, resecuring and reposting the warning sign and all other months checked okay.		Check List: *Fences *Air Monitoring (RWP only) *Rad. Warning Signs *Locked Gates

**PERSONNEL MONITORING SUMMARY DATA  
FOR 4<sup>TH</sup> – QUARTER 2003 TO 3<sup>RD</sup> – QUARTER 2004**

<b>Personnel Monitoring Items:</b>	<b>Required Analysis:</b>	<b>Highest Result Obtained:</b>	<b>Allowable:</b>
1. Semi-Annual or as needed personnel TLD (DDE):	Gamma ( $\frac{\text{rem}}{\text{yr}}$ )	NM	0.500(Active Level)
2. Semi-Annual or as needed Bioassay:	Total Uranium ( $\frac{\text{ug}}{\text{l}}$ )	NM	15-35(Active Level)
3. Bi-Weekly or Quarterly air sample	Gross Alpha ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$6E^{-11}$ (DAC)
(Also Note: Action Level is 10% of an application doses limit)	Th-230(uci)/ml	NM	$6E^{-12}$ (DAC)
	RA-226( $\frac{\text{uci}}{\text{ml}}$ )	NM	$3E^{-10}$
	PB-210( $\frac{\text{uci}}{\text{ml}}$ )	NM	$1E^{-10}$ (DAC)
	RN-222( $\frac{\text{uci}}{\text{ml}}$ )	NM	$4E^{-6}$ (DAC)
	(-Daughter)		
	U-Nat( $\frac{\text{uci}}{\text{ml}}$ )	NM	$2E^{-11}$ (DAC)
<b>Personnel Exposure:</b>			
4. Estimated Annual Total Effective Dose Equivalent (TEDE):	TEDE(rem)	NM	5.0(MAX.) 2.0(Action Level)

NOTE: The above items are only required under an RWP as needed (see PMP, REV. 4). And no RWP was issued during this reporting period.

NM-Not Monitored

TABLE - 1  
QUARTERLY LIQUID SAMPLES

PAGE 10 OF 10

<u>Date/Qr.</u>	<u>Location</u>	<u>Type</u>	<u>Radionuclide</u>	<u>Concentration</u>		<u>Error Est.</u> <u>μcl/ml</u>	<u>LLD</u> <u>μcl/ml</u>
				<u>Mg/l</u>	<u>μcl/ml</u>		
<u>4TH-QR. 2003</u>	<u>GW-3</u>	<u>GROUND</u>	U-Nat (dissolved) or total		<u>7.04E<sup>-08</sup></u>		<u>2.00E-10</u>
<u>TO 3RD-QR.</u>		<u>WATER WELL</u>					
<u>2004 HIGHEST RESULT</u>			Th-230 (dissolved) or total		<u>2.00E<sup>-10</sup></u>		<u>2.00E-10</u>
UNC Field Data:	PH (STD. Units) = 6.81		Ra-266 (dissolved) or total		<u>3.00E<sup>-10</sup></u>	<u>3.00E<sup>-10</sup></u>	<u>2.00E-10</u>
	Cond. (μ MHOS) = 5,820						
	Water Depth (Ft.) = 50.55		Pb-210 (dissolved) or total		<u>1.00E<sup>-9</sup></u>		<u>1.00E-09</u>
	Temp. (°C) = 17.7						
			Po-210 (dissolved) or total				<u>1.00E-09</u>

COMMENTS: GW-4 is not producing enough water to pump since the 4TH-QR. of 1999.

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