UNITED NUCLEAR
CORPORATION
MINING AND MILLING DIVISION

July 24, 1978

Mr. Joseph Pierce
Environmental Improvement Division
Water Quality Section
P. O. Box 968
Santa Fe, N. M. 87503

Re: Experimental Heap Leach Pads —
Ambrosia Lake

Dear Mr. Pierce:

The following application for discharge plan approval is submitted pursuant to the New Mexico Water Quality Control Commission regulations, subsection 3-106C for United Nuclear Corporation's experimental heap leach pads at Ambrosia Lake:

1. Quantity, quality and flow characteristic of the discharge

United Nuclear Corporation is intending to construct an experimental heap leach facility at Ambrosia Lake to test the feasibility of extracting uranium from mine ores that contain uranium in concentrations too low to mill economically. The experimental pads are designed to use water pumped from UNC's Section 27 mine to leach uranium from the ore, to collect this leach water beneath the pads and to route this water to the IX Plant in the Old Phillips Mill. Under the existing ion exchange system at the Old Phillips Mill, water is pumped through underground pipes from the Section 27 mine to the Old Phillips Mill for uranium extraction and recycled to the mine for further elution of uranium. The proposed experimental heap leach facility would merely create a loop in the system for additional uranium extraction. No release of water to groundwaters is planned or anticipated through the use of the proposed experimental facility. Any seepage from the experimental pad into groundwater is not anticipated and should be non-existent due to the double containment system under the pad. This system is illustrated in Section 'B-B' on the enclosed drawing No. AMB-1-01-01-D, and consists of six mil thick polyethylene plastic sheeting under which is a permaprime sealant layer sprayed on the leveled ground beneath the plastic sheeting.

The objective of constructing an experimental heap leach pad is to obtain data for the design and operation of a full scale heap leaching operation. The flow rates of water applied to the top of the

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ore pile, the percolation rates through the pile, the collection rates beneath the pile, the changes in water quality as percolation occurs, and the economic feasibility of the entire operation are all parameters to be measured and evaluated through the construction and operation of the experimental facility. Thus UNC can only estimate parameters associated with the project operations. These parameters include:

Input water quality

Uranium	11 mg/L
Ra-226	13 pCi/L
Flow rates	<100 gal/min.

Output water quality

To be monitored: seepage rate 0 gal/min.; <<500 mg/L.

2. Location of discharge of any bodies of water, water courses, or water discharge sites within one-mile radius and existing or proposed monitoring wells

The experimental heap leach pads will be placed on Section 27, T14N, R9W, adjacent to UNC's Section 27 mine in Ambrosia Lake. See Figure 1. No effluent is anticipated from the experimental pads. Within a one-mile radius from the pads is located the evaporation ditch-pond used to contain the periodic overflows from the Old Phillips Mill IX, the Ann Lee mine water holding pond, the inactive Old Phillips tailings pile, and the inactive "Voight tank" pond. No other water courses or bodies of water exist in the area.

As indicated on the enclosed drawing, three groundwater monitoring wells will be air drilled or cable tool drilled outside the permaprime sealant to detect any possible seepage from the ponds. Each well will be drilled through the alluvium beneath the ponds approximately 40 feet, and then approximately three feet into the Mancos. The bottom few feet of each well can be packed with gravel if deemed appropriate for the collection of groundwater. On top of the Mancos the groundwater flows towards the north, specifically N30°E. Thus, to intercept any seepage from the pads, one well will be located to the north of the long dimension of the pads, a second well to the east of the pads and a third well to the west of the pads. The exact number of feet from the outside of the berm around the pads to the wells will be established during construction.

3. Depth to and TDS of groundwater most likely affected by the discharge

Any seepage from the experimental heap leach pads will enter the alluvium beneath the pond and could reach groundwater located at the 40 foot deep interface between the bottom of the alluvium and the top of the Mancos shale.

Upon approval of this plan, the three proposed monitoring wells will be drilled and the TDS of the water monitored prior to the beginning of leach operations.

4. Flooding potential of the site

An annual rainfall of 13.83 inches per year was projected from consecutive 15-year averages of annual rainfall. A maximum probable storm of 20 inches is likewise projected. Due to the flat nature of the terrain around the experimental heap leach pads and the berm constructed around the pads, little effect on the pads is anticipated from flooding.

5. Location and design of sites and methods for sampling and measurement or calculation of flow

The location of the experimental heap leach pads has been presented under Item 2 above. The design of the pads has been presented in drawing No. AMB-1-01-01-D. Proposed parameters to be monitored monthly are U, Ra, Mo, Se, and V.

Should significant seepage occur from the pads these elements have the greatest potential to affect groundwaters beneath the pads. Thus, the monitoring program has been specifically designed to detect seepage from the pad which, if present, will provide useful data for the design of full scale heap leach pads.

The wells will be sampled using standard bailing techniques.

As the proposed project is designed to be operated for less than one year and is designed to provide operational data for future heap leach operations, a monthly monitoring frequency is proposed. If full scale heap leach operations become attractive in the future, the groundwater monitoring data collected during the duration of this experimental operation will serve as a basis for the selection of a sampling schedule applicable to a full scale project should it develop.

6. Depth to and lithographic description of rock underlying the alluvium

Directly beneath the 40 feet of alluvium lies Mancos shale. This material is a limey medium gray to black marine shale interbedded infrequently with platey laminated light gray to grayish yellow to white limestone and gypsum. The Mancos is approximately 520 feet thick under the discharge point. Below the Mancos is the Dakota Formation. This 80 foot thick layer of continental and marginal marine sandstone is uniformly fine grained well-sorted gray to pure

white, with some interbedded siltstone and coal. Beneath the Dakota is the 70 foot thick Brushy Basin member of the Morrison Formation and then the Westwater Canyon member of the Morrison Formation.

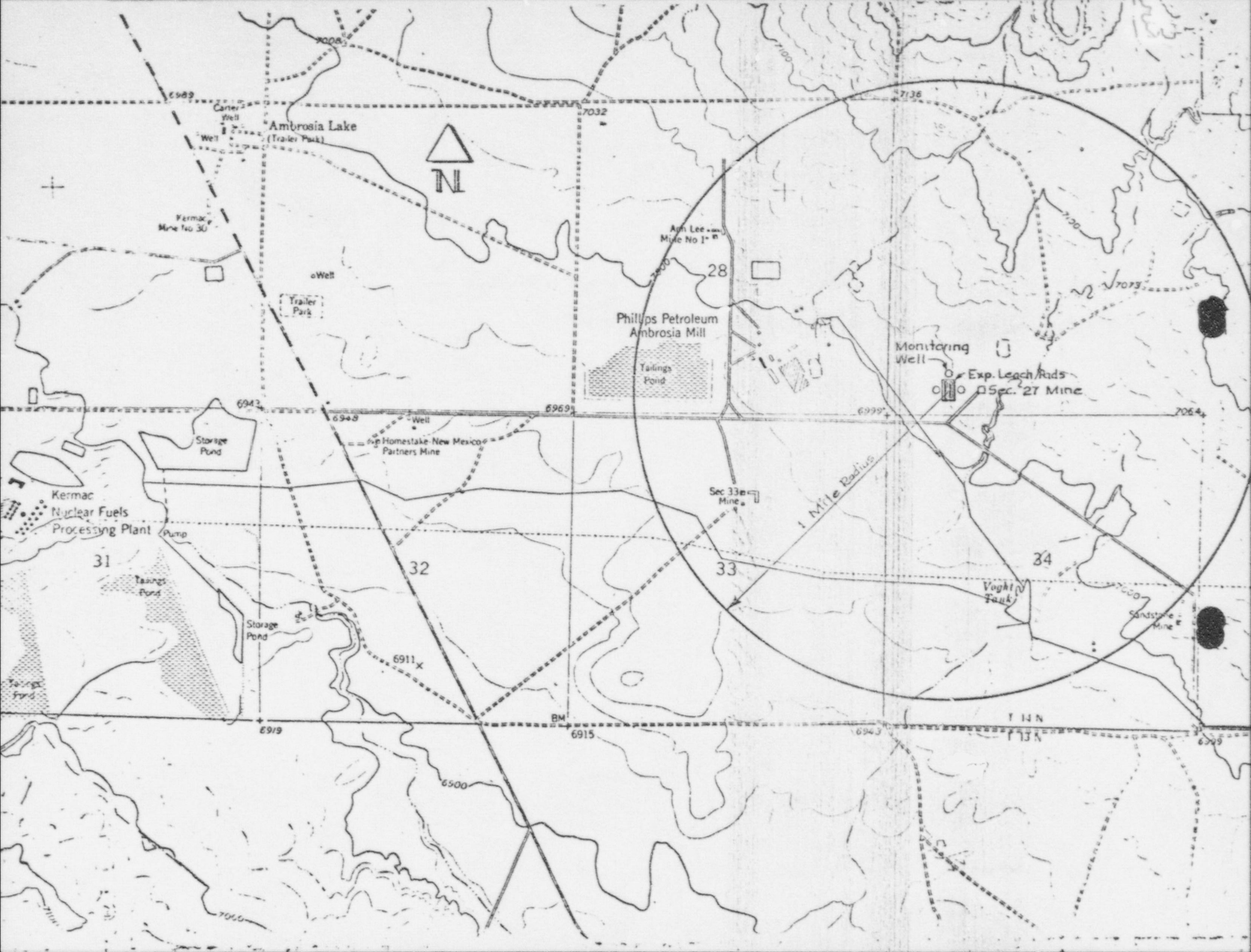
7. Any additional information that may be necessary to demonstrate that approval of the discharge plan will not result in either concentrations in excess of the standards of Section 3-103 or the presence of toxic pollutants at any place of withdrawal of water for present or reasonably foreseeable future use. Detailed information on site geologic and hydrologic conditions may be required for a technical evaluation of the applicant's proposed discharge plan.

This plan has been discussed in telephone calls with Maxine Goad and Bruce Gallaher of the NMEID in an attempt to provide the needed information for approval. To date no additional information has been requested or required.

Sincerely yours,

N. F. Savignac
Manager, Environmental Services

NFS:olk
Enc. 2


Ambrosia Lake
(Trailer Park)
Carter Well
Well
Kermac Mine No 30
Well
Trailer Park
Ann Lee Mine No 1
28
Phillips Petroleum
Ambrosia Mill
Tailings Pond
Monitoring Well
Exp. Leach Pads
Sec. 27 Mine
1 Mile Radius
Well
Homestake-New Mexico Partners Mine
Storage Pond
Sec 33 Mine
Kermac
Nuclear Fuels
Processing Plant
Pump
31
32
33
34
Tailings Pond
Storage Pond
Voght Tank
Sandstone Mine
BM
6915
6919
6911
6500
T 19 N
T 18 N

J.J. Vismaraga

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Grants, New Mexico

Mill

Copy to: Church Rock

	Haulage	Face	1st week WL	2nd Week WL	3rd Week WL	4th Week WL	Comments
	Col No- 1 2 3 Top		.01				
	Col No- 1-2-3 Bottom		.01				
	Yellow Cake TANK		.02				
	Bottom Part of Mill		.02				
	WARE House		.0			-	
	Maintenace Shop		.0				
	Office		.0				
	Guard House		.0				

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United Nuclear Corporation
New Mexico Operations

Mine Mill
Date 4/4/78

cc: Mine Dept.
Mine Environ. Engr.
Ventilation Foreman

UNDERGROUND GAMMA RADIATION SURVEY

Time	Location	Approx. U308 Grade %	Gamma Radiation mR/hr.		Remarks
			Drift Center	1.0 to face/rib	
11:45 AM	Col. 1-2-3 Top		.15		
11:50	Col. 1-2-3 Bottom		.20		
12:00	Yellow Cake Tank		.10		
12:05 PM	Bottom Part of Mill		.30		
12:10	Ware House		.05		
12:15	Maintenance Shop		.05		
12:25	Office		.05		
12:30	Guard House		.05	= .16 MPC	

11/29/77

Instrument Used: Ludlum Geiger Counter
Model 2

Survey by: J.J. Visarraga

RSJ/bjm