Division of United Nuclear Corporation
A UNC RESOURCES Company

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December 7, 1981

Mr. S. E. Reynolds
State Engineer
New Mexico Natural Resources Department
Water Resources Division
Bataan Memorial Building
Santa Fe, New Mexico 87503

Re: QUARTERLY REPORT - UNC MINING & MILLING
Northeast Church Rock Tailings Facility
File No. 3346

Dear Mr. Reynolds:

In response to the April 2, 1981 letter from the NMSEO, and pursuant to Section 72-5-9 NMSA 1978, the following report is submitted to document the tailings disposal operations and condition of the tailings dam at the NE Church Rock site for the three month period of September, October and November 1981:

DETAILS OF MILL PRODUCTION AND TAILINGS DISPOSAL

Actual mill production for the last three months period, along with tonnages used for mine backfill and tailings solution from Borrow Pit No. 2 returned to the mill, are summarized below:

Item	Sept.	Oct.	Nov.	Total	% Diff. from Last Quarter
Ore processed (dry tons)	38,351	34,814	38,260	111,425	+5.5%
Tons of cycloned tailings sand hauled out from tailings area for mine backfill	1,674	4,929	2,139	8,742	-32.0
Tons of sand actually placed in the mine	0	1,905	2,523	4,428	-53.3%
Tailings solution returned to the mill (gallons)	9,082,000	10,589,000	7,429,000	27,100,000	+7.9%

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The tailings from the mill were conveyed as a slurry which averaged about 50% solids. Approximately 62.8% of the time, the tailings were passed through the cyclone located on the south side of the central cell. The underflow from the cyclone was discharged in the vicinity of the cyclone, as shown on the map. The cyclone overflow was discharged in the vicinity of the crescent dike. The remaining 37.2% of the time the tailings were spigotted as whole tailings in the north and middle portion of the western part of the central cell. Attached map shows the total hours tailings were discharged at various locations.

The tailings material being used for the mine backfill operation was obtained from the coarse cyclone underflow, being loaded into trucks from a staging area near the cyclone. 8742 tons of sand were trucked during this quarter.

As shown in the summary, the amount of ore processed and the tailings solution returned to the mill increased slightly. The ratio of tailings solution returned to the mill to the tonnage milled remained more or less the same compared to the last quarter. The ten 400-Series seepage extraction pumps on Section 36 were turned off on September 14, 1981, and so were the three 300-Series pumps around the tailings area on November 30, 1981. Therefore, no seepage extraction water is being returned to the borrow pits now.

Tailings fluid which naturally separates from the tailings solids during deposition was contained within the borrow pits. Borrow Pit No. 1 has been filled to about 6968' elevation with slimes and sand and a 2' increase in the elevation of the liquid and/or slimes was permitted by NMEID on November 30, 1981. Borrow Pit No. 2 is also being filled slowly with slime; the maximum permissible liquid level by NMEID in this pit is 6968'. The method of tailings disposal, direction of flow of tailings solution in the central cell, location of pumps and the cyclone remained the same as in the last quarter. The mill operated on a weekly schedule of roughly two and one-third days on.

RELATED ENGINEERING WORK

UNC proposal for construction of central cell embankment raise by 10' was approved by NMEID on September 14, 1981 and by NMSEO on September 15, 1981. The construction of the southeast evaporation ponds and the central cell embankment raise have been deferred at this time, since UNC has taken recourse to other alternatives.

The present plan, which is the culmination of past several months' studies to investigate the feasibility and economies of tailings slurry neutralization, is to neutralize all the tailings coming out of the mill, as well as the tailings liquids in the borrow pits to pH 7.0 by lime and make use of the north and south cells for neutralized tailings solid and liquid storage. This approach will significantly reduce and ultimately prevent the introduction of contaminated liquids into the aquifers underlying the tailings site. The beneficial effects will be more immediate than commencing construction of evaporation ponds. The proposal has been approved by NMEID on November 17, 1981, and UNC is in the process of answering certain questions asked by NMSEO in their November 17, 1981 letter, to get their approval.

UNC completed the repair of cracks that occurred due to drying in the downstream sandy zone at the breach repair section of the main dam on October 16, 1981. Storage of dry coarse tailings in the north cell has also been deferred since the present plan is to store neutralized tailings liquid there. The project to install the demonstration sprinkling system on the dry beaches of the south cell to control windblown dust has not been commissioned. UNC determined that while operating the sprinkler system, some accumulation of tailings liquid (maximum 2') could not be avoided in the south pond, which is dry. NMEID by their October 22, 1981 letter disapproved any storage of tailings liquid when the installation of the pipe lines was stopped. Again, since the present proposal is to use the south pond for neutralized tailings solids and liquid storage, windblown dust problems will be minimized.

Three other projects were completed during this quarter as follows: Seeding of the Section 36 area where 400-Series wells were drilled was completed in September; the commercial power line was extended in October 1981, to cover various parts of the tailings area; drilling of the new 500-Series wells was completed on November 25, 1981. These wells are planned to identify the extent of seepage, stratigraphic zone-wise around the tailings impoundment area, and thus will enable UNC to design and install a complete seepage control program. The work to seal off certain composite wells to stop communication between aquifers, which may cause additional contamination to the lower zone, is currently in progress. This is to comply with NMEID's letter of July 10, 1981. Final seepage extraction wells of the 500-Series will be drilled in the next quarter, and it is anticipated that the final seepage control plan will be in effect toward the end of next quarter. A request was made by UNC on November 19, 1981 to the NMEID for their approval to modify the water level and water quality monitoring program. This was approved on November 30, 1981. The weekly reporting frequency was also changed to monthly.

CONDITION OF THE TAILINGS DAMS

The stability of the north and south cross dikes and the main dam had remained essentially unchanged during the recent quarterly reporting period. The cross section geometry for the cross dikes and the main dam at the critical locations passing through NP-2, SP-2A and HP-1841, where previous stability analyses (quarter ending May 1981) were performed, remained unchanged, as determined by recent surveying. The changes in the piezometric surfaces affecting the stability of these structures at the cross section locations are summarized below:

PIEZOMETRIC SURFACE ELEVATIONS (FEET)

	Piezometer No.	Previous Period 5/22/81	Current Period 11/30/81	Difference
North Cross Dike	NP-2	6956.71	6956.98	+0.27
South Cross Dike	SP-2A	6964.91	6964.51	-0.40
Main Dam	HP-1841	6951.67	6952.10	+0.43

Changes in the critical factor of safety resulting from the miniscule changes in the phreatic surface, as noted above, will be very very minor. Therefore, there was no need to perfomm stability analysis and it is concluded that the critical factors of safety for the three structures will be very similar to those reported in the previous quarter, as noted below:

MINIMUM FACTOR OF SAFETY

Structure	Static Loading	Pseudo-Static Loading (g=0.1)
North Cross Dike	3.3	2.2
South Cross Dike	5.6	2.7
Main Dam	2.1	1.5

Tailings deposition during the quarter progressed from the central part of the central cell toward the Borrow Pit No. 1. The level of the slimes and liquid in this pit now exceeds 6968.0' and more and more slimes are flowing into the Borrow Pit No. 2, where the liquid now stands at 6966.0' elevation. The Wells 107, 108, 326, 327, 328, 14-D, and Piezometer B1 and B2 are inaccessible and surrounded by tailings. As mentioned earlier, the minor shrinkage cracks on the downstream sandy zone in the breach repair area of

the main dam were recently repaired, and a report was sent to the NMSEO. No other cracks, nor any unusual condition was noticed during this quarter. Compliance has been maintained with all the directives of the NMEID and NMSEO pertaining to the tailings disposal operation, dam safety, ponding of liquid, free board, liquid level in borrow pits, etc.

The plots of the recorded settlement for the monuments along the north and south cross dikes and the main dam are enclosed. Though settlement is still in progress, it is my opinion that the primary settlement has already taken place and the recent settlements are very slow and small.

DISPOSAL PLAN FOR THE NEXT QUARTER

It should be noted that the mill is operating on an extension until the Discharge Plan is approved by the NMEID. It is anticipated that tailings deposition will continue in the central cell area, gradually filling up the central portion and the Borrow Pit No. 1.

A low ground pressure Kamatsu dozer is currently in use, which has been very helpful in spreading out the deposited tailings and leveling up the tailings mounds to make room for the cyclone underflow sand without moving the cyclone. The dozer is also used to push aside some of the coarse cyclone underflow tailings for better dewatering before being loaded into trucks for mine backfilling operation.

Very soon UNC will start neutralizing the tailings fluid stored in the borrow pits. The neutralization of the tailings slurry and use of the north and south pond for storage of neutralized solids and liquids will follow as soon as the NMSEO's requirements are satisfied and approval is granted.

This report has attempted to document the significant aspects of tailings disposal operations, engineering works and general conditions of the tailings impoundment area at the UNC NE Churchrock site during the fall quarter of 1981.

If you should require any further documentation of these operations, or have any comment, please do not hesitate to contact me.

Respectfully submitted,

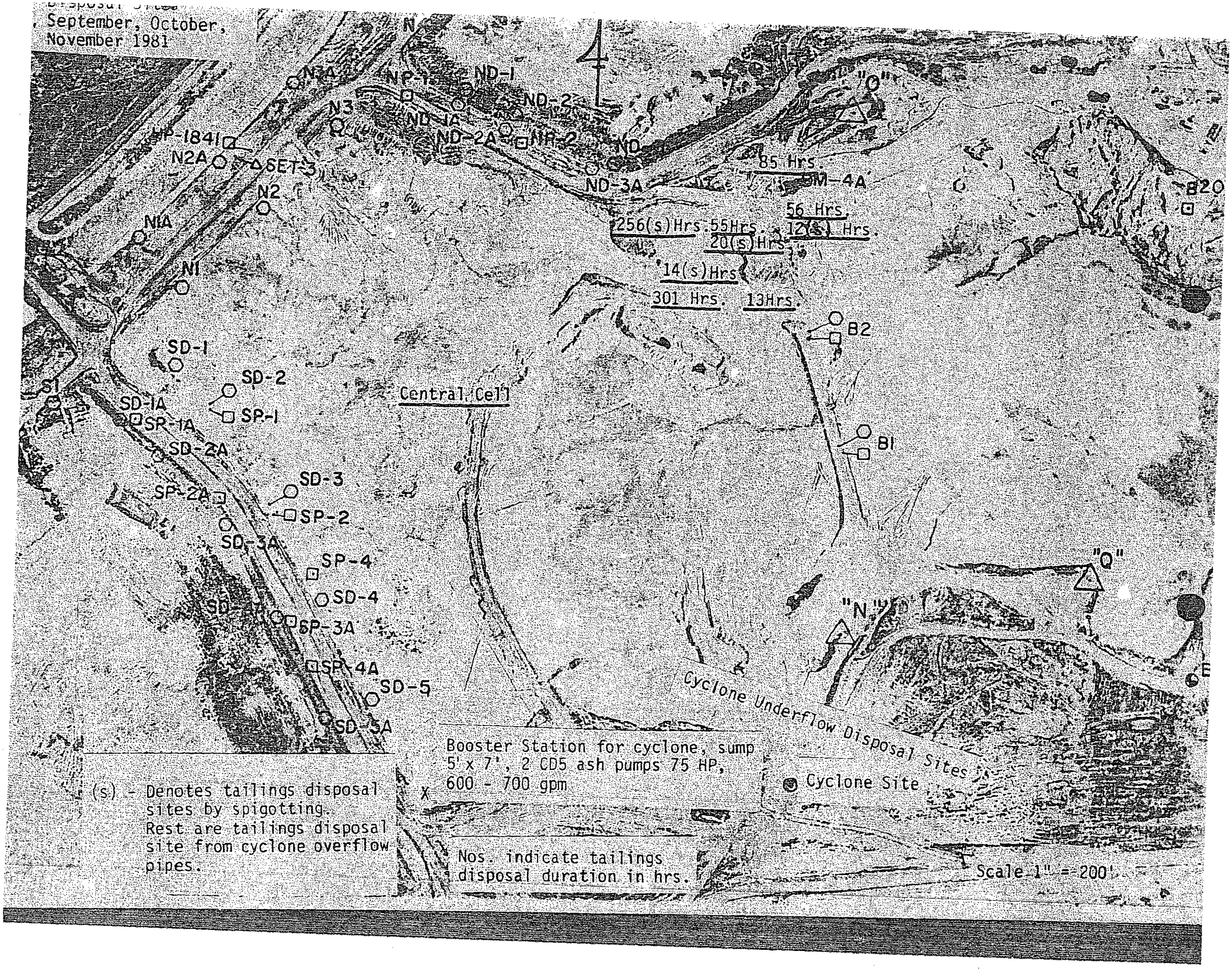
Satya Deb Misra

Satya Deb Misra, P.E.
Senior Engineer

SATYA DEB MISRA NEW MEXICO 1621 REGISTERED PROFESSIONAL ENGINEER

cc: Mr. Thomas Baca, Director, NMEID
Mr. Thomas M. Hill, Director
UNC Tailings Management

Enclosures


September, October,
November 1981
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N
N2A
NP-1
ND-1
ND-2
N3
ND-1A
ND-2A
NP-2
ND
HP-184
N2A
SET-3
N2
N1A
N1
ND-3A
85 Hrs.
M-4A
B2
56 Hrs.
256(s) Hrs.
55Hrs.
12(s) Hrs.
20(s) Hrs.
14(s) Hrs.
301 Hrs.
13Hrs.
B2
SD-1
SD-2
Central Cell
SD-1A
SP-1
SP-1A
SD-2A
B1
SD-3
SP-2A
SP-2
SD-3A
SP-4
SD-4
SD-4A
SP-3A
SP-4A
SD-5
SD-5A
"O"
"N"
Cyclone Underflow Disposal Sites
Booster Station for cyclone, sump
5' x 7', 2 CD5 ash pumps 75 HP,
600 - 700 gpm
Cyclone Site
(s) - Denotes tailings disposal
sites by spigotting.
Rest are tailings disposal
site from cyclone overflow
pipes.
Nos. indicate tailings
disposal duration in hrs.
Scale 1" = 200'