UNC MINING AND MILLING

Division of United Nuclear Corporation
A UNC RESOURCES Company

P.O. Box 3951
Albuquerque, New Mexico 87190

4801 Indian School Road, N.E.
Albuquerque, New Mexico 87110

Telephone 505/265-4421

November 14, 1979

Mr. Cubia Clayton
Bureau Chief
NM ENVIRONMENTAL IMPROVEMENT DIVISION
P. O. Box 968
Santa Fe, NM 87503

Subject: NECR TAILINGS IMPOUNDMENT

Dear Mr. Clayton:

To ensure compliance with NMEID letter dated October 23, 1979 and October 31, 1979, and the NRC Order dated October 26, 1979, the following documents are forwarded for the week of operations November 4th through November 10th, 1979.

1. Sergent, Hauskins & Beckwith weekly report to the New Mexico State Engineer.

2. Summary sheet of the freeboard levels in the northern and southern cells and the borrow pit area.

3. Analysis of water samples from monitoring wells 201 and 202.

4. Daily inspection sheets for starter dam, north and south cross dikes.

5. Evaporation and precipitation record.

6. Response to your letter to Mr. D. D. Turberville dated October 31, 1979.

Cleanup operations in the arroyo and the Rio Puerco are continuing. Should you find it necessary to discuss item 6 at greater length, UNC Mining and Milling personnel will be pleased to meet with you at your convenience.

Sincerely,

H. J. Abbiss, P.E.
Vice President
Environmental and Safety Services

Copy: Mr. Ross Scarano, NRC
Dr. John Nelson

SERGENT, HAUSKINS & BECKWITH CONSULTING SOIL AND FOUNDATION ENGINEERS

APPLIED SOIL MECHANICS • ENGINEERING GEOLOGY • MATERIALS ENGINEERING

B. DWAINE SERGENT, P.E. | JOHN B. HAUSKINS, P.E. | GEORGE H. BECKWITH, P.E.
DALE V. BEDENKOF, P.E. | ROBERT D. BOOTH, P.E. | BENNY E. McMILLAN, P.E.
BUD WOODWARD

November 14, 1979

State of New Mexico
Natural Resources Department
Water Resources Division
Bataan Memorial Building
Santa Fe, New Mexico 87503

SHB Job No. E79-1096

eccseig
esg NM
by DOC Env unc

Attention: Mr. S. E. Reynolds
State Engineer

Re: Church Rock Tailings Dam
Church Rock, New Mexico

Gentlemen:

Transmitted herewith are (1) liquid surface elevations of the north, central and southern cells as well as the borrow pit, (2) readings on the piezometers installed in the northern and southern cross dikes, (3) horizontal and vertical measurements on the survey monuments installed in the northern and southern cross dikes and the starter dam, and (4) readings on the Hall Hydrostatic Pressure Cell Piezometers (HPC-7's) installed on the downstream side of the existing starter dam. These data are for the week ending November 10, 1979.

Should any questions arise concerning the attached data, please do not hesitate to call.

Respectfully submitted,
Sergent, Hauskins & Beckwith Engineers

By Robert D. Booth
Robert D. Booth, P.E.

ROBERT D. BOOTH NEW MEXICO 5711 REGISTERED PROFESSIONAL

Copies: Addressee (1)
United Nuclear Corporation (10)

REPLY TO: 2821 GIRARD BLVD., N.E., ALBUQUERQUE, NEW MEXICO 87107

PHOENIX (602) 272-6848 | ALBUQUERQUE (505) 345-8606 | EL PASO (915) 591-8188 | TUCSON (602) 884-9333

POND LIQUID SURFACE ELEVATIONS

DATE	NORTH POND	CENTRAL POND	SOUTHERN POND	BORROW PIT
09/06/79	6956.4	6954.4	6953.4	---
09/13/79	---	---	6953.1	---
09/20/79	6955.8	6954.0	6952.7	---
09/24/79	6955.6	6954.0	6952.7	---
10/01/79	6955.3	6953.7	6952.5	---
10/08/79	---	---	6952.2	---
10/11/79	6955.0	6954.6	6952.2	---
10/17/79	6954.6	6953.4	6951.9	---
10/21/79	6954.6	6953.1	6951.8	---
10/23/79	6954.6	6953.9	6951.3	---
10/24/79	6954.6	6953.5	6951.5	---
10/25/79	6954.7	6953.4	6951.4	---
10/26/79	6954.7	6953.8	6951.7	---
10/27/79	6954.6	6955.0	6951.6	---
10/28/79	6954.6	6954.0	6951.6	---
10/29/79	6954.6	6954.3	6951.6	---
10/30/79	6954.5	6954.4	6951.7	6939.2
10/31/79	6954.5	6954.8	6951.6	6939.6
11/01/79	6954.5	6954.7	6951.6	6939.9
11/02/79	6954.5	6955.2	6951.6	6940.5
11/03/79	6954.4	6955.5	6951.5	6940.7
11/04/79	6954.4	6955.6	6951.5	6941.9
11/05/79	6954.4	6955.9	6951.6	6942.6
11/06/79	6954.3	6956.8	6951.5	6942.1
11/07/79	6954.3	6956.1	6951.5	6942.5
11/08/79	6954.5	6956.3	6951.6	6943.3
11/09/79	6954.4	6956.3	6951.6	6943.6
11/10/79	6954.5	6956.3	6951.6	6943.6

10 Aug

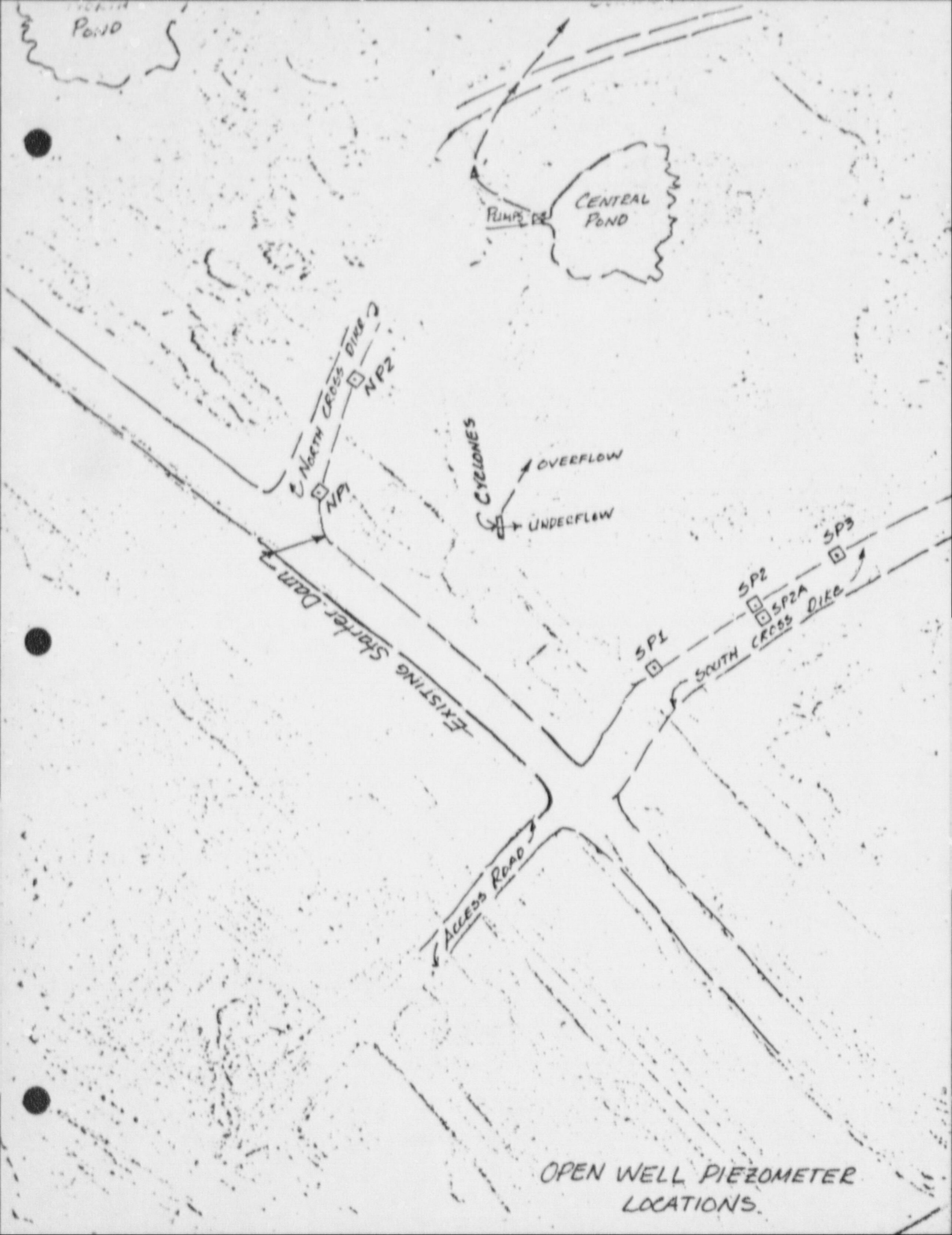
6939.2
4.4

6959
6940
19

19

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • ALBUQUERQUE • SANTA FE



OPEN WELL PIEZOMETER LOCATIONS.

OPEN WELL PIEZOMETER READINGS

PIEZOMETER READINGS

DATE	SP-1	SP-2	SP-2A	SP-3	NP-1	NP-2
*11/05/79	12'5"	10'2"	11'2"	9'6"	13'5"	20'4"
**11/06/79	12'5"	10'2"	11'2"	9'6"	13'5"	20'4"
**11/07/79	6956.0	6956.7	6956.5	6957.0	6951.8	6947.8
**11/08/79	6956.0	6956.7	6956.5	6957.0	6951.8	6947.8
**11/09/79	6956.0	6956.7	6956.5	6957.0	6951.8	6947.8
**11/10/79	6956.0	6956.7	6956.5	6957.0	6951.8	6947.8

* Depth of liquid from ground surface

** Elevation of liquid surface

Scanlon & associates, inc.

engineers and planners 79064

November 13, 1979

United Nuclear Corporation
Real Estate and Facilities Division
4801 Indian School Road
Albuquerque, New Mexico 87108

ATTN: Robert G. Patterson

Gentlemen:

Enclosed herein are the most recent results of the monitoring survey for the tailings dam at United Nuclear Corporation's Church Rock Mill site. This data contains results from monitoring run number 6. The tabulated data provides slope distance and vertical measurements to 29 monitoring stations placed on the existing tailings dam and cross dikes. Distances are taken from five primary control monuments in the dam vicinity. Section A of this report contains a tabulation of slope distances measured by field survey, Section B contains a tabulation of relative distance change from the base reference at run number 2, and Section C contains a tabulation of elevation data.

Elevations contained herein are based on spirit level measurements from known bench marks. Accuracy of elevations is plus or minus three hundredths (±0.03) of a foot. Distances shown herein are taken from electronic distance meter measurements. Run numbers 1 and 3 have distance accuracies of plus or minus four hundredths (±0.04) of a foot. All other runs have distance accuracies of plus or minus three hundredths (±0.03) of a foot.

The monitoring survey is set up to allow for periodic remeasurement of distance and elevation data. A remeasurement cycle can be completed in approximately three (3) days. We believe that the monitoring survey will be sufficient to measure any movement of the dam.

Sincerely,

SCANLON & ASSOCIATES, INC.

Clifford E. Anderson
New Mexico P.E. & L.S. #6472

cc: Sergent, Hauskins & Beckwith
U.N.C. Church Rock Mill

PLEASE REPLY TO:

☐ SANTA FE, NEW MEXICO 87502 — P.O. BOX 4577, 1302 OSAGE AVENUE — TELEPHONE: (505) 983-3323

☒ ALBUQUERQUE, NEW MEXICO 87110 — 8008 PENNSYLVANIA CIRCLE NE — TELEPHONE: (505) 265-6941

☐ ARTESIA, NEW MEXICO 88210 — 510 WEST TEXAS — TELEPHONE: (505) 748-1010

UNC TAILINGS DAM

CHURCH ROCK

Scale: 1" = 525'

SECTION A

Slope Distances

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79064

INSTRUMENT STATION "A"

RUN NO.	1	2	3	4	5	6	
INSTRUMENT	HP-3805	HP-3808	*	HP-3808A	HP-3808A	HP-3808A	
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-1-79	11-6-79	
TIME	2:35 P.M.	10:30 AM	*	4:30 P.M.	5:10 P.M.	10:45 A.M.	
H.M.	4.99'	4.35'	*	4.35'	4.36'	4:36'	
WEATHER	P.Cldy 0-5	Clr.,0-10	*	*	Clr. 0-5	Clr. 0-3	
TEMP.	*	66°F	*	*	40°F	56°F	
PRESS.	7025.10	7000	*	7025.10	7025.10	7025.10	
CORR.	*	*	*	*	57 ppm	65 ppm	
	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.
"O"	*	4012.272	*	4012.270	4012.281	4012.298	
S8	1491.49	1491.480	*	1491.501	1491.503	1491.514	
S9	1308.09	1308.081	*	1308.099	1308.123	1308.115	
S10	1130.16	1130.135	*	1130.150	1130.177	1130.163	
S11	960.68	960.648	*	960.666	960.694	960.680	
S12	807.59	807.554	*	807.579	807.563	807.588	
"M"	*	2096.941	*	2096.940	2096.927	2096.945	

* NO MEASUREMENT

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

INSTRUMENT STATION "M"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79064

RUN NO.	1	2	3	4	5	6	
INSTRUMENT	HP-3805	HP-3808	*	HP-3808A	HP-3808A	HP-3808A	
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
TIME	4:00 P.M.	12:00 P.M.	*	3:30 P.M.	2:30 P.M.	11:30 A.M.	
H.M.	5.42'	4.63'	*	4.63'	4.63'	4.63'	
WEATHER	P.Cldy.5-15	Clr.Wm.0-10	*	*		Clr. 0-3	
TEMP.	*	72°F.	*	*	48°	60°F	
PRESS.	6990.72	6900'	*	6990.72	6990.72	6990.72	
CORR.	*	68ppm	*	*	60 ppm	65 ppm	
	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.
"C"	*	*	*	2054.627	2054.650	2054.641	
"I"	*	2150.228	*	MONITOR STA. "I"		HAS BEEN	LOST
S8	1353.27	1353.278	*	1353.298	1353.309	1353.317	
S9	1453.46	1453.494	*	1453.527	1453.527	1453.526	
S10	1571.90	1571.923	*	1571.943	1571.933	1571.946	
S11	1706.91	1706.932	*	1706.945	1706.942	1706.944	
S12	1853.37	1853.415	*	1853.465	1853.481	1853.495	
"A"	*	2096.810	*	2096.816	2096.807	2096.812	

* NO MEASUREMENT

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

INSTRUMENT STATION "N"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79064

RUN NO.	1	2	3	4	5	6	
INSTRUMENT	HP-3805	HP-3808	HP-3805	HP-3808A	HP-3808A	HP-3808A	
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
TIME	11:00 AM	3:30 PM	11:30 AM	1:00 PM	1:30 P.M.	1:00 P.M.	
H.M.	5.33'	4.58'	4.58'	4.58'	4.58'	4.58'	
WEATHER	Cl,Wm,0-5	Cl,Wm 0-15	Cldy 20-45	*		Clr. 0-3	
TEMP.	*	78°F	57°F	*	48°	60°F	
PRESS.	6996.27	6960'	6996'	6996.27	6996.27	6996.27	
CORR.	*	71 ppm	60 ppm	*	60 ppm	65 ppm	
	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.
"P"	*	1580.233	1580.202	1580.234	1580.223	1580.217	
N1	1332.96	1332.966	*	1332.966	1332.978	1332.916	
N2	1286.52	1286.523	*	1286.520	1286.527	1286.504	
N3	1281.70	1281.687	*	1281.701	1281.692	1281.667	
N4	1306.56	1306.565	*	1306.577	1306.572	1306.552	
N5	1362.64	1362.648	*	1362.658	1362.657	1362.630	
SD1	1290.10	1290.092	1290.078	1290.086	1290.097	1290.068	
SD2	1203.63	1203.639	1203.636	1203.649	1203.653	1203.647	
SD3	1052.72	1052.698	1052.666	1052.635	1052.635	1052.633	
SD4	933.96	933.958	933.952	933.968	933.966	933.966	
SD5	849.14	849.129	849.094	849.114	849.119	849.119	
ND1	1183.95	1183.925	1183.922	1183.937	1183.944	1183.931	
ND2	1099.10	1099.086	1099.088	1099.106	1099.096	1099.089	
ND3	935.91	935.904	935.898	*	935.921	935.909	
"O"	*	933.896	933.892	933.903	933.901	933.903	

* NO MEASUREMENT

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

INSTRUMENT STATION "O"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79064

RUN NO.	1	2	3	4	5	6	
INSTRUMENT	HP-3805	HP-3808	HP-3805	HP-3808A	HP-3808A	HP-3808A	
DATE	8-15-79	9-18-79	10-20-79	10-26-79	11-2-79	11-6-79	
TIME	8:20 AM	2:30 PM	1:15PM	10:45 AM	9:15 AM	3:30 P.M.	
H.M.	5.55'	4.76'	4.76'	4.76'	4.76'	4.76'	
WEATHER	Rain 0-5	Cl, Wm0-10	Cldy 20-45	Cl., 5-15	Cl., 0-5	Cldy. 5-15	
TEMP.	64°F	78°F	60°F	60°F	40°F	57°F	
PRESS.	7007.76	6980	7008'	7007.76	7007.76	7007.76	
CORR.	*	6980	60 ppm	67 ppm	56 ppm	63 ppm	
	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.
"N"	934.01	934.011	933.996	934.016	934.009	934.013	
N1	1229.77	1229.761	*	1229.750	1229.755	1229.771	
N2	1061.80	1061.802	*	1061.801	1061.787	1061.801	
N3	914.26	914.250	*	914.237	914.252	914.254	
N4	788.76	788.729	*	788.712	788.737	788.732	
N5	700.87	700.835	*	700.842	700.844	700.839	
N6	661.92	661.875	*	661.881	661.891	661.885	
N7	683.22	683.191	*	683.194	683.208	683.204	
N8	757.38	757.347	*	757.345	757.363	757.357	
N9	758.32	758.289	*	758.292	758.302	758.293	
N10	761.83	761.800	*	761.804	761.815	761.806	
N11	817.52	817.498	*	817.502	817.507	817.490	
N12	861.14	861.120	*	861.119	861.121	861.109	
N13	918.35	918.335	*	918.333	918.347	918.326	
N14	977.68	977.672	*	977.678	977.695	977.683	
N15	1032.75	1032.741	*	1032.744	1032.753	1032.745	
N16	1068.29	1068.282	*	1068.283	1068.287	1068.286	
SD1	1286.04	1286.044	1286.006	1286.022	1286.014	1286.026	
SD2	1256.80	1256.808	1256.784	1256.803	1256.793	1256.816	
SD3	1249.18	1249.167	1249.084	1249.066	1249.072	1249.093	
SD4	1283.33	1283.270	1283.270	1283.289	1283.275	1283.312	
SD5	1351.29	1351.283	1351.250	1351.259	1351.269	1351.273	
ND1	689.03	689.000	688.996	688.993	689.002	689.008	
ND2	598.30	598.257	598.252	598.258	598.266	598.265	
ND3	428.34	428.277	428.276	428.270	428.284	428.288	
"P"	1032.86	1032.911	1032.882	1032.909	1032.907	1032.903	

* NO MEASUREMENT

8008 PENNSYLVANIA CIRCLE, N.E.
ALBUQUERQUE, NM 87110

INSTRUMENT STATION "P"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79064

RUN NO.	1	2	3	4	5	6	
INSTRUMENT	HP-3805	HP-3808	*	HP-3808A	HP-3808A	HP-3808A	
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
TIME	8:00 AM	1:15: PM	*	11:00 AM	12:30 PM	4:30 P.M.	
H.M.	5.41'	4.37'	*	4.37'	4:37'	4.37'	
WEATHER	Pt Cldy 0-5	Cl,WM 0-5	*	*		Cldy. 0-5	
TEMP.	70°F	76°F	*	*	43°F	55°F	
PRESS.	7048.26	7020	*	7048.26'	7048.26	7048.26	
CORR.	*	72 ppm	*	*	57 ppm	63 ppm	
	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.	SLOPE DIST.
"N"	*	1580.495	*	1580.498	1580.495	1580.492	
N6	1509.61	1509.554	*	1509.553	1509.557	1509.561	
N7	1399.13	1399.075	*	1399.071	1399.079	1399.082	
N8	1308.77	1308.721	*	1308.730	1308.724	1308.735	
N9	1142.25	1142.196	*	1142.198	1142.195	1142.205	
N10	959.64	959.552	*	959.556	959.554	959.565	
N11	786.06	785.950	*	785.963	785.953	785.955	
N12	703.83	703.712	*	703.722	703.718	703.721	
N13	631.16	631.029	*	631.035	631.027	631.035	
N14	561.86	561.711	*	561.732	561.725	561.734	
N15	492.50	492.325	*	492.336	492.335	492.330	
N16	412.50	412.296	*	412.310	412.312	412.311	
"O"	*	1033.229	*	1033.22	1033.228	1033.237	

* NO MEASUREMENT

SECTION B

Relative Distance Change

Geotechnical Associates, Inc.
8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

MONITOR STATION RELATIVE CHANGE

INSTRUMENT STATION "A"

CLIENT U.N.C. MILLING

PROJECT TAILINGS DAM

LOCATION CHURCH ROCK, NM

JOB NO. 79084

RUN NO.	1	2	3	4	5	6	7
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-1-79	11-6-79	
MONITOR I.D. NUMBER		BASE REFERENCE DISTANCE	**	RELATIVE	CHANGE	(F T.)	
"O"	*	4012.272	*	-0.002	+0.009	+0.026	
S8		1491.480	*	+0.021	+0.023	+0.034	
S9		1308.081	*	+0.018	+0.042	+0.034	
S10		1130.135	*	-0.025	+0.042	+0.028	
S11		960.648	*	+0.018	+0.046	+0.032	
S12		807.554	*	+0.025	+0.009	+0.034	
"M"		2096.941	*	-0.001	-0.014	+0.004	

* NO MEASUREMENT TAKEN

** PLUS INDICATES DISTANCE AWAY FROM INSTRUMENT LOCATION. MINUS INDICATES DISTANCE TOWARD INSTRUMENT LOCATION.

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

MONITOR STATION RELATIVE CHANGE
INSTRUMENT STATION "M"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO 79034

RUN NO.	1	2	3	4	5	6	7
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
MONITOR I.D. NUMBER		BASE REFERENCE DISTANCE	**	RELATIVE	CHANGE		(F T.)
"O"	*	*	*	2054.627 REF	+0.023	+0.014	
"I"		2150.228	*	MONITOR STA. "I" HAS BEEN LOST			
S8		1353.278	*	+0.020	+0.031	+0 039	
S9		1453.494	*	+0.033	+0.033	+0.032	
S10		1571.923	*	+0.020	+0.010	+0.023	
S11		1706.932	*	+0.013	+0.010	+0.012	
S12		1853.415	*	+0.050	+0.066	+0.080	
"A"		2096.810	*	+0.006	-0.003	+0.002	

* NO MEASUREMENT TAKEN

** PLUS INDICATES DISTANCE AWAY FROM INSTRUMENT LOCATION. MINUS INDICATES DISTANCE TOWARD INSTRUMENT LOCATION.

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

MONITOR STATION RELATIVE CHANGE
INSTRUMENT STATION "N"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79084

RUN NO.	1	2	3	4	5	6	7
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
MONITOR I.D. NUMBER		BASE REFERENCE DISTANCE	**	RELATIVE	CHANGE		(FT.)
"P"		1580.233	-0.031	+0.001	-0.010	-0.016	
N1		1332.966	*	0.000	+0.012	-0.050	
N2		1286.523	*	-0.003	+0.004	-0.019	
N3		1281.687	*	+0.014	+0.005	-0.020	
N4		1306.565	*	+0.012	+0.007	-0.013	
N5		1362.648	*	+0.010	+0.009	-0.018	
SD1		1290.092	-0.014	-0.006	+0.005	-0.024	
SD2		1203.639	-0.003	+0.010	+0.014	+0.008	
SD3		1052.698	-0.032	-0.063	-0.063	-0.065	
SD4		933.958	-0.006	+0.010	+0.008	+0.008	
SD5		849.129	-0.035	-0.015	-0.010	-0.010	
ND1		1183.925	-0.003	+0.012	+0.019	+0.006	
ND2		1099.086	+0.002	+0.020	+0.010	+0.003	
ND3		935.904	-0.006	*	+0.017	+0.005	
"O"		933.896	-0.004	+0.007	+0.005	+0.007	

* NO MEASUREMENT TAKEN

** PLUS INDICATES DISTANCE AWAY FROM INSTRUMENT LOCATION. MINUS INDICATES DISTANCE TOWARD INSTRUMENT LOCATION.

Dames & Moore
8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

MONITOR STATION RELATIVE CHANGE
INSTRUMENT STATION "O"

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 7908A

RUN NO.	1	2	3	4	5	6	7
DATE	8-15-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
MONITOR I.D. NUMBER		BASE REFERENCE DISTANCE	** RELATIVE CHANGE (FT.)				
"N"		934.011	-0.015	+0.005	-0.002	+0.002	
N1		1229.761	*	-0.011	-0.006	+0.010	
N2		1061.802	*	-0.001	-0.015	-0.001	
N3		914.250	*	-0.013	+0.002	+0.004	
N4		788.729	*	-0.017	+0.008	+0.003	
N5		700.835	*	+0.007	+0.009	+0.004	
N6		661.875	*	+0.006	+0.016	+0.010	
N7		683.191	*	+0.003	+0.017	+0.013	
N8		757.347	*	+0.002	+0.016	+0.010	
N9		759.289	*	+0.003	+0.013	+0.004	
N10		761.800	*	+0.004	+0.015	+0.006	
N11		817.498	*	+0.004	+0.009	-0.008	
N12		861.120	*	-0.001	+0.001	-0.011	
N13		918.335	*	-0.002	+0.012	-0.009	
N14		977.672	*	+0.006	+0.023	+0.011	
N15		1032.741	*	+0.003	+0.012	+0.004	
N16		1286.044	*	+0.001	+0.005	+0.004	
SD1		1286.044	-0.038	-0.022	-0.030	-0.018	
SD2		1256.808	-0.024	-0.005	-0.015	+0.008	
SD3		1249.167	-0.083	-0.101	-0.095	-0.074	
SD4		1283.270	0.000	+0.019	+0.005	+0.042	
SD5		1351.283	-0.033	-0.024	-0.014	-0.010	
ND1		689.000	-0.004	-0.007	+0.002	+0.008	
ND2		598.257	-0.005	+0.001	+0.009	+0.008	
ND3		428.277	-0.001	-0.007	+0.007	+0.011	
"P"		1032.911	-0.029	-0.002	-0.004	-0.008	

* NO MEASUREMENT TAKEN

** PLUS INDICATES DISTANCE AWAY FROM INSTRUMENT LOCATION. MINUS INDICATES DISTANCE TOWARD INSTRUMENT LOCATION.

Sergent, Hauskins & Beckwith, Inc.
Engineers - Geologists - Hydrologists
8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79094

MONITOR STATION RELATIVE CHANGE

INSTRUMENT STATION "P"

RUN NO.	1	2	3	4	5	6	7
DATE	8-16-79	9-18-79	10-20-79	10-27-79	11-2-79	11-6-79	
MONITOR I.D. NUMBER		BASE REFERENCE DISTANCE	* *	RELATIVE	CHANGE	(FT.)	
"N"	*	1580.495	*	+0.003	0.000	-0.003	
N6		1509.554	*	-0.001	+0.003	+0.007	
N7		1399.075	*	-0.004	+0.004	+0.007	
N8		1308.721	*	+0.009	+0.003	+0.014	
N9		1142.196	*	+0.002	-0.001	+0.009	
N10		959.552	*	[illegible]0.004	+0.002	+0.013	
N11		785.950	*	+0.013	+0.003	+0.005	
N12		703.712	*	+0.010	+0.006	+0.009	
N13		631.029	*	+0.006	-0.002	+0.006	
N14		561.711	*	+0.021	+0.014	+0.023	
N15		492.325	*	+0.011	+0.010	+0.005	
N16		412.296	*	+0.014	+0.016	+0.015	
"O"	*	1033.229	*	-0.006	-0.001	+0.008	

* NO MEASUREMENT TAKEN

* * PLUS INDICATES DISTANCE AWAY FROM INSTRUMENT LOCATION. MINUS INDICATES DISTANCE TOWARD INSTRUMENT LOCATION.

SECTION C

Elevations

8008 PENNSYLVANIA CIRCLE, NE
ALBUQUERQUE, NM 87110

CLIENT U.N.C. MILLING
PROJECT TAILINGS DAM
LOCATION CHURCH ROCK, NM
JOB NO. 79004

MONITOR STATION ELEVATIONS

RUN NO.	1	2	3	4	5	6	7
DATE	8-17-79	9-17-79	10-20-79	10-27-79	11-1-79	11-5-79	
MONITOR ID NUMBER	ELEVATION						
N1	6968.967	6968.973	6968.943	6968.950	6968.947	6968.943	
N2	69.260	69.266	69.230	69.240	69.230	6969.227	
N3	68.830	68.837	68.806	68.817	68.803	6968.800	
N4	67.960	67.964	*	67.940	67.930	6967.930	
N5	69.360	69.373	*	69.357	69.350	6969.350	
N6	69.370	69.380	*	69.359	69.347	6969.350	
N7	69.887	69.900	*	69.883	69.876	6969.877	
N8	69.990	69.000	*	68.980	68.977	6968.973	
N9	70.427	70.433	*	70.403	70.406	6970.403	
N10	69.047	69.060	*	69.023	69.026	6969.020	
N11	68.057	68.070	*	68.036	68.046	6968.047	
N12	67.630	67.637	*	67.603	67.610	6967.607	
N13	68.103	68.117	*	68.086	68.087	6968.083	
N14	68.580	68.580	*	68. 39	68.550	6968.543	
N15	68.090	68.103	*	68.073	68.080	6968.080	
N16	68.910	68.927	*	68.896	68.907	6968.903	
ND1	68.217	68.201	68.146	68.160	68.146	6968.143	
ND2	68.413	68.401	68.336	68.350	68.356	6968.340	
ND3	72.886	72.911	72.860	72.873	72.880	6972.870	
SD1	68.580	68.563	68.493	68.500	68.490	6968.483	
SD2	69.960	69.926	69.866	69.870	69.867	6969.863	
SD3	69.160	69.116	68.976	68.986	68.980	6968.980	
SD4	67.913	67.823	67.693	67.709	67.693	6967.700	
SD5	6968.723	6968.710	6968.636	68.650	68.647	6968.650	
S8	6964.980	64.955	*	64.940	64.940	6964.940	
S9	6964.610	64.561	*	64.516	64.514	6964.510	
S10	6963.690	63.668	*	63.656	63.660	6963.660	
S11	6964.090	64.048	*	64.026	64.030	6964.033	
S12	6964.417	64.348	*	64.303	64.304	6964.293	
NORTH POND	*	*	6954.6	6954.66	6954.47	6954.33	
INDICATOR BOARD #1 NORTH POND			*	*	*	6954.37	
CENTER POND		*	6953.1	6953.71	6954.86	6955.80	
INDICATOR BOARD #1 CENTER POND			*	*	*	6955.9	
SOUTH POND		*	6951.8	6951.81	6951.65	6951.53	
INDICATOR BOARD #1 SOUTH POND				*		6951.1	
BORROW PIT	*	*	*	*	*	6942.12	
INDICATOR BOARD #1 - BORROW PIT				*	*	6942.15	

* NO MEASUREMENT

LOCATION OF HALL HYDROSTATIC PRESSURE CELLS (HPC-7)

Piezometer Number	Location
PS-1	Not Yet Installed
PS-2	Not Yet Installed
PS-3	25' L of CL Sta. 13+00
PS-4	100' L of CL Sta. 13+00
PS-5	100' L of CL Sta. 19+00
PS-6	25' L of CL Sta. 19+00
PS-7	25' L of CL Sta. 24+50
PS-8	25' L of CL Sta. 30+50
PS-9	25' L of CL Sta. 39+00
PS-10	100' L of CL Sta. 45+00
PS-11	25' L of CL Sta. 45+00
PS-12	25' L of CL Sta. 50+00
PS-13	100' L of CL Sta. 56+60
PS-14	100' L of CL Sta. 56+60

Gus

PIEZOMETRIC READINGS

Date: 11-9-79

Console # 78

TAILINGS DAM EMBANKMENT

Observer: R.D. Wooten - D. Armstrong

Piezometer Numbers	PS-1	PS-2	PS-3	PS-4	PS-5	PS-6	PS-7	PS-8	PS-9	PS-10	PS-11	PS-12	PS-13	PS-14
Serial Number	2251	2253	2247	2250	2254	2260	2261	2264	2268	2269	2270	2271	2279	2300
Gauge Reading			22	48	28	26	7	12	13	15	14	17	14	17
Indicated Pressure (PSI)			1.3	2.9	1.7	1.6	0.4	0.7	0.8	0.9	0.8	1.0	0.8	1.0
Δ P (PSI)	Not Installed	Not Installed	2.1	2.9	1.9	1.6	0.4	0.6	0.6	0.5	0.9	1.0	1.1	0.9
Actual Pressure (PSI)			0	0	0	0	0	0.1	0	0	0	0	0	0.1
Pressure Cell Elevation (FT)			6927.5	6922.5	6923.6	6928.6	6929.0	6935.4	6947.6	6959.6	6962.6	6957.0	6962.0	6965.0
Piezometric Pressure (FT)			0	0	0	0	0	0.2	0	0	0	0	0	0.2
Piezometric Elevation (FT)			6927.5	6922.5	6923.6	6928.6	6929.0	6935.6	6947.6	6959.6	6962.6	6957.0	6962.0	6965.2

Indicated Pressure = Gauge Reading x 0.06

Piezometric Pressure = Actual Pressure x 2.307

Δ P - Taken from Calibration Graph

TEMP 5°C

REMARKS: _____

FREE BORED GAUGE RECORD
DAILY SUMMARY

	SHIFT	SOUTH		CENTRAL		PIT	NORTH		SURVEILLANCE MAN
		1	2	3	4	5	6	7	
OCT 26	1								
	2								
	3	52.8	52.5	<59.0	54.0	40.0	55.7	55.7	Bourguiver
27	1	51.8	51.5	<57.0	54.8	<40.0	54.7	54.7	Romero
	2	52.7	52.6	<50.0	49.9	40.7	54.6	54.6	Levato
	3	51.8	51.6	58.0	55.0	40.6	54.6	54.7	Bourguiver
28	1	51.8	51.6	<58.0	54.3	40.6	54.6	54.7	Romero
	2	51.7	51.6	<50.0	54.0	40.5	54.6	54.6	Levato
	3	51.7	51.5	<50.0	54.0	<40.5	54.6	54.7	Bourguiver
29	1	51.7	51.5	<50.0	54.7	<40.5	54.6	54.7	Romero
	2	51.6	51.6	<59.0	54.3	<40.5	54.5	54.5	Levato
	3	51.6	51.3	<57.0	54.7	40.5	54.6	54.6	Bourguiver
30	1	51.7	51.3	<59.0	54.7	40.6	54.6	54.5	McLellan
	2	51.6	51.6	<59.0	46.5	<40.5	55.6	55.6	Levato
	3	51.6	51.3	<59.0	55.0	<40.5	54.4	54.6	Bourguiver
31	1	51.7	51.3	<59.0	55.2	<40.5	54.4	54.5	Bourguiver
	2	50.6	50.6	<58.0	55.0	<40.5	54.5	54.5	Levato
	3	51.6	51.3	<58.0	54.8	<40.5	54.5	54.5	Bourguiver
NOV 1	1	51.5	51.3	<58.0	55.7	<40.5	54.5	54.5	McLellan
	2	51.6	51.6	<58.0	54.8	<40.5	54.5	54.5	Levato
	3	51.6	51.6	<58.0	54.6	<40.5	54.5	54.5	Romero
2	1	51.6	51.6	<58.0	55.3	<40.5	54.4	54.5	McLellan
	2	51.5	51.5	<58.0	55.5	<40.6	54.3	54.5	Levato
	3	51.5	51.5	<58.0	55.0	39.5	54.3	54.4	Romero
3	1	51.5	52.4	<58.0	52.8	40.7	54.3	54.4	McLellan
	2	51.6	51.2	<58.0	55.5	40.7	54.3	54.4	Bourguiver
	3	51.6	NR	<58.0	56.0	40.7	54.3	54.4	Romero
4	1	51.5	51.2	<58.0	55.4	41.9	54.3	54.4	McLellan
	2	51.4	51.2	<58.0	55.6	41.0	54.3	54.4	Bourguiver
	3	51.4	51.2	<58.0	55.4	41.2	54.3	54.4	Romero
5	1	51.4	51.2	<58.0	55.3	41.4	54.3	54.4	McLellan
	2	51.4	51.2	<58.0	55.1	41.6	<54.3	54.4	McLellan
	3	51.4	51.1	<58.0	56.0	41.8	54.3	54.4	Romero
6.	1	51.4	51.4	<58.0	55.7	42.0	54.3	54.4	Levato
	2	51.4	51.4	<58.0	56.0	42.2	54.3	54.6	Bourguiver
	3	51.4	51.1	<58.0	56.0	42.4	54.3	54.6	Romero

Note — The first two digits of all elevations shown is 6900 ft.

FREE BOARD GAGE RECORD

DAILY SUMMARIES

1979 Date	Shift	South 1	South 2	Central 3	Central 4	Pit 5	North 6	North 7		Surveillance Man
Nov 7	1	<51.4	51.1	<58.0	56.0	42.6	54.5	54.4		Lovato
	2	51.4	51.2	<58.0	56.0	42.6	54.2	54.3		Berquiver
	3	51.4	51.2	<58.0	56.4	42.7	54.2	54.3		Romero
8	1	51.5	51.3	<58.0	56.4	43.0	54.2	54.4		Lovato
	2	51.6	51.2	<58.0	56.2	43.4	54.4	54.6		Berquiver
	3	51.5	51.2	<58.	56.4	43.	54.4	54.5		McLellan
9	1	51.5	51.3	<58.0	56.3	43.6	54.4	54.6		Lovato
	2	51.6	51.3	NR	56.3	43.6	54.4	54.5	Station No.3 Gage down	Berquiver
	3	51.5	51.2	NR	56.4	43.6	54.3	54.3	to extend sand beach.	McClellan
10	1	51.5	51.2	NR	56.4	43.6	54.4	54.5		I. Todd
	2	51.5	51.2	NR	56.4	43.5	54.4	54.5		Romero
	3	51.5	51.2	NR	56.4	43.2	54.4	54.5		James

MONITOR WELL ANALYSIS REPORT

Sample Identification/ Sampling Date	Well-201 (11-9-79)	Well-202 (11-9-79)
Chloride (mg/l)	80.9	70
Conductivity (μmhos/cm)	3800 @ 20°C	4550 @ 19°C
Salinity (parts/thousand)	2	3
pH 25°C	4.23	4.17
Sulfate (mg/l)	5974.5	6256.3
Total Dissolved Solids (mg/l)	9218	10928

UNC MINING AND MILLING

UNC RESOURCES Company
Church Rock Operations
PO Drawer 90
Gallup, New Mexico 87301
Telephone 505 722-8851

Memorandum

DATE: 4 Nov 79

CC: Bob Booth (SH&B)
Mill File 2.02.10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: G A Swanquist

Time: From 12 am A.M./P.M. / TO 12 am A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark:

General Comments: Solids building up near tailings transfer pump - Modifying inlet to cope with slimes build up

UNC MINING AND MILLING

Division of United Nuclear Corporation
A UNC RESOURCES Company

Church Rock Operations
PO Drawer QQ

Gallup, New Mexico 87301
Telephone 505 722-6651

Memorandum

DATE: November 5, 1979

CC: Bob Booth (SMP)
Mill File 10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: C. E. Oliver

Time: From 12:13 ~~A.M.~~/P.M. TO 12:33 ~~A.M.~~/P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark: ____________

General Comments: ____________

UNC RESOURCES

MEMORANDUM

DATE: 6 x 6 x 79

CC: Bob Booth (SH&B)
Mill File 2.02.10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: G. A. Swanquist

Time: From 7:30 A.M./P.M. TO 4:30 A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark: _____

General Comments: Started to deposite clay material over North West face of borrow pit rock outcrops to seal rock face and prevent possible seepage

UNC [illegible] ING AND MILLING

UNC RESOURCES Company — Church Rock Operations — P.O. Drawer QQ — Gallup, New Mexico 87301 — Telephone 505 722-6651

Memorandum

DATE: 7 Nov 79

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

CC: Bob Booth (SH&B)
Mill File 2.02.10

Inspection Conducted by: G A Swanquist

Time: From 9:30 am A.M./P.M. TO 1:00 pm A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark:

General Comments: Finished clay soil lining of rock out crop @ borrow pit

UNC RESOURCES

Memorandum

DATE: 2 Nov 79

CC: Bob Booth (SH&B)
Mill File 2.02.10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: G Swanquist

Time: From 4:00 A.M./P.M. TO 5 pm A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark:

General Comments: About ½" rain last 24 hrs as of 11 am — Extremely muddy — Instructed surveillance men not to go to South end of dam — too slick and dangerous.

Depositing road with machinery on North side of central dike to extend beach.

Having safety shut down — 15

Shut down grinding @ 6 pm

UNC RESOURCES

Memorandum

DATE: 7 Nov 79

CC: Bob Booth (SH&B)
Mill File 2.02.10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: G A Swanquist

Time: From 2pm A.M./P.M. TO 3pm A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark:

General Comments: Read Newlin, and staff Construction equipment extending beach on North side of central cross dike

Appox 10am to 11am Tailings site inspection by Dept State Engineer Dan Lopez accompanied by T. Abbiss, Bob Booth, Chuck Wolff and G. Swanquist & Tom Blevins

Area stil muddy—

UNC MINING AND MILLING

UNC RESOURCES

DATE: 10 Nov 79

CC: Bob Booth (SHAB)
Mill File 2.02.10

TO: D. D. Turberville, J. Abbiss, T. M. Kilroy

FROM: G. A. Swanquist

SUBJECT: Daily Inspection - Starter Dam, North & South Cross Dikes

Inspection Conducted by: G A Swanquist

Time: From 1:30 pm A.M./P.M. TO 4:30 pm A.M./P.M.

Check as applicable

	1. Seepage		2. Cracks		3. Settlement	
	YES	NO	YES	NO	YES	NO
1. Starter Dam		✓		✓		✓
2. North Cross Dike		✓		✓		✓
3. South Cross Dike		✓		✓		✓

Description and qualifying statement to each "Yes" mark:

General Comments: Work to extend sand beach progressing ok - should finish by tomorrow noon

EVAPORATION AND PRECIPITATION RECORD

DATE	1 READING BEGINNING	2 READING ADDED	3 READING ENDING	4 INDICATED EVAPORATION	5 PRECIP- itation	6 TRUE EVAPOR	7 NUMBER OF DAYS	8 EVAPO PER DAY
10-26	3.936							
11-5		2.989						
11-12			4.505	2.326	.745	3.074	16	.192

ALL READINGS IN INCHES

Method of Calculation:

#4 Indicated evaporation- 1 + 2 - 3 = 4

#6 True evaporation- 4 + 5 = 6

UNC MINING AND MILLING

Division of United Nuclear Corporation
A UNC RESOURCES Company

Church Rock Operations
P.O. Drawer QQ

Gallup, New Mexico 87301
Telephone 505/722-6651

Memorandum

DATE: November 12, 1979

CC: T. M. Kilroy

TO: H. J. Abbiss

FROM: G. A. Swanquist

SUBJECT: New Mexico Environmental Improvement Division letter dated October 31, 1979, signed by Mr. Cubia Clayton: five numbered items on Page 2.

Compliance with the items listed on Page 2 of this letter will be difficult. Each item will require some form of instrumentation. The accuracy of this instrumentation is a critical consideration. At best, under ideal conditions, we may approach $\pm$5% aggregate system accuracy. This $\pm$5% discrepancy in measurement could be misinterpreted as representing seepage in the borrow pit. Recognizing this, the design and implementation of any instrumentation used to meet these measurement requirements must be critically evaluated.

In response to the individual items listed on Page 2 of the letter:

1. The measurement of the water discharged to the pit will have to be done with a recording flowrater installed near the discharge of the transfer pump.
2. In order to measure the quantity of solids discharged, a nuclear gauge density meter should be installed so that the solids quantity can be calculated.

3. The volume of water in storage can be calculated by planimeter measurements; however, the accuracy is approximate.

4. Precipitation measurements have been taken for the past several months. Records are now being kept on a weekly basis. It will be most difficult, perhaps impossible, to have an accurate measurement of the total volume of fluid added to the pit. The outline of the run-off area is inexact. If we assume no infiltration or evaporation in this run-off area, this compounds the inaccuracy of measurement.

5. Evaporation measurements are being taken; however, thermal differences between the ponds and the references, add potential inaccuracies to these measurements.

Finally, to calculate volumes on 0.10 ft. increments, assumes a greater accuracy than we have within our present surveying capabilities. It will be virtually impossible to achieve this degree of accuracy mainly due to the irregularities of the terrain.

I believe that the $\pm$5% figure of accuracy stated previously is extremely optimistic for this aggregate system. We need a good discussion with our consultants relating to what we can do and what we cannot do. Bob Booth and perhaps, Earl B. Hall in the instrumentation area will be of assistance in this task. Gail Billings could have some input in this matter as well.

It will be extremely difficult to arrive at a materials balance with an accountable balance that could not be misinterpreted as seepage. To compound our problems, the proposed system of sprinkling for enhancement of evaporation must also be considered. With the long leadtimes of instrumentation availability, 6 to 8 weeks minimum, installation, and a break-in period, we may approach the end of this interim operating period. Additionally, the costs for such an instrumentation system will not be insignificant. These could easily exceed $10,000.00. I believe it imperative that all these issues be discussed.

Acid Spray
Radioactivity
In Aerosol