Log No. 62782
Rec. 19
Well No. .....
Permit No. .....
Do not fill in

WELL LOG AND REPORT TO THE STATE ENGINEER OF NEVADA

PLEASE COMPLETE THIS FORM IN ITS ENTIRETY

Owner: Nuclear Engineering Co. Inc. Driller: Lewis C. Cook

Address: 65 Ray Street, Pleasanton, Calif. Address: Box 244 Lathrop Wells, Nev. Lic. No. 279

Location of well: ....¼....¼ Sec...., T....N/S, R....E, in Nye County

or 600' South N¼ Corner of Section 35, Township 13S, Range 47 E, MDB&M

Water will be used for: Test Purpose Total depth of well: 575'

Size of drilled hole: 10-5/8" Weight of casing per linear foot: .....

Thickness of casing: 10 Gage Temp. of water: .....

Diameter and length of casing: 8" O.D. 573'
(Casing 12" in diameter and under give inside diameter; casing 12" in diameter give outside diameter.)

If flowing well give flow in c.f.s. or g.p.m. and pressure: .....

If nonflowing well give depth of standing water from surface: 315'

If flowing well describe control works: .....
(Type and size of valve, etc.)

Date of commencement of well: May 22, 1961 Date of completion of well: June 27, 1961

Type of well rig: Rotary

LOG OF FORMATIONS

From feet	To feet	Thickness feet	Type of material
0.0	2	2'	Sandy Loam
2	33	31	Boulders Sand & Large Gravel
33	45	12	Small gravel & Sand
45	134	89	Boulders, Large gravel & Brown sandy clay
134	147	13	Boulders
147	148	1	Brown clay
148	156	8	Boulders & Large gravel
156	161	5	Brown clay shale
161	235	74	Boulders, Sandy red & orange clay streaks. Cored from 181' to 206½', recovered approximately 17' core.
235	265	30	Boulders & Large gravel
265	302	37	Brown clay. Cored from 275' to 280', recovered 5' core.
302	308	8	White bentonic clay
308	322	14	Brown bentontic clay

(OVER)

Water-bearing Formation, Casing Perforations, Etc.

Chief aquifer (water-bearing formation)
from 472 to 488 ft.
553 561

Other aquifers: .....

First water at 472 feet.

Casing perforated
from 453' to 493' ft.
513' 573'

Size of perforations
3/16 X 3"

919

COPY

COPY

SAMPLES FROM NUCLEAR ENGINEERING COMPANY WELL (CON'T)

	546 FEET.	CUTTINGS CONSIST OF ABOUT EQUAL AMOUNTS OF LIGHT AND DARK VOLCANIC ROCK, SCHIST AND QUARTZITE.
2:	548 FEET.	GRAVELS IN LIGHT-BROWN CALY. VOLCANICS, SCHIST AND WELL - ROUNDED PEBBLES.
	552 FEET.	CUTTINGS OF LIGHT AND DARK COLORED VOLCANIC ROCKS, SCHIST AND QUARTZITE.
	555 FEET.	REDDISH-COLORED CLAY WITH GRAVELS OF SCHIST AND SOME VOLCANICS.
	565 FEET.	SCHIST AND QUARTZITE PREDOMINATE, WITH SOME VOLCANICS.
	674 FEET.	MOSTLY SERICITIC SCHISTOSE ROCK. EITHER LARGE BOULDERS OR POSSIBLY BASEMENT ROCK.

PERMEABILITY

IN GENERAL, THE MATERIALS REFERRED TO IN THE LOG AND SAMPLE DESCRIPTION AS GRAVEL AND SAND ARE PERMEABLE AND TRANSMIT WATER READILY; THE MATERIALS DESCRIBED AS CLAY, OR CONTAINING APPRECIABLE PROPORTIONS OF CLAY, ARE RELATIVELY IMPERMEABLE AND TRANSMIT WATER SLOWLY OR NOT AT ALL. IN MIXTURES OF SAND AND CLAY OR GRAVEL AND CLAY, THE CLAY TENDS TO FILL THE INTERSTICES BETWEEN THE LARGE PARTICLES, THUS REDUCING THE PERMEABILITY TO WATER.

QUANTITATIVE MEASUREMENTS OF PERMEABILITY MADE ON SAMPLES OF DRILL CUTTINGS ARE OF DOUBTFUL VALUE, BECAUSE, 1) THE FRAGMENTS OBTAINED HAVE BEEN GROUND INTO SMALLER PIECES BY THE DRILL BIT, 2) POORLY CONSOLIDATED CLAY AND OTHER FINE MATERIALS MAY BE WASHED AWAY IN THE COURSE OF WASHING DRILLING MUD FROM THE SAMPLES, AND 3) IT IS IMPOSSIBLE TO RECONSTITUTE THE SAMPLES TO THEIR ORIGINAL CONDITION. UNDISTURBED CORES OF FINE-GRAINED OR PLASTIC MATERIAL MAY BE TAKEN BY DRIVING AN OPEN-ENDED CORING TUBE INTO THE MATERIAL AND CONSOLIDATED ROCKS MAY BE CORED USING DIAMOND-BIT OR ROLLER-BIT CORING EQUIPMENT. CORES OF CLAY OR OTHER PLASTIC MATERIAL MUST BE PROTECTED AGAINST DRYING AND THE CHANGES IN PHYSICAL PROPERTIES

COPY

COPY

SAMPLES FROM NUCLEAR ENGINEERING COMPANY WELL (CON'T)

20.	280 FEET.	BROWN SANDY CLAY FROM CORE BARREL. CONTAINS ABOUT 30% OF FINE TO COARSE SAND. SOME GRAINS ARE WELL ROUNDED.
21.	306 FEET.	WHITE, BROWN AND YELLOW BANDS OF BENTONITIC CLAY. CONTAINS A LITTLE GRAVEL FROM VOLCANIC ROCKS.
22.	345 FEET.	WHITE TO BROWN BENTONITIC CLAY WITH BOULDERS. CUTTINGS ARE MOSTLY WHITE AND PINK SOLIDIFIED FELSITIC ROCK.
23.	356 FEET.	WHITE ALTERED ROCK WITH WHITE CLAY. IT IS A CARBONATE ROCK AND PROBABLY AN IMPURE FRESH-WATER LIMESTONE. ALSO CUTTINGS OF DARK-COLORED LIMESTONE, VOLCANIC ROCKS AND SOME QUARTZITE.
24.	384-385 FEET.	WHITE CLAYEY ROCK CONTINUOUS FROM 356 FEET. MUCH WHITE CLAY. CUTTINGS ARE FROM A WHITE CLAYEY-CARBONATE LIKE THAT IN SAMPLE 23.
25.	445 FEET.	DARK-RED SANDY CLAY SUTTINGS OF DARK VOLCANIC ROCKS. SOME SMALL-ROUNDED PEBBLES OF DARK GRAY VOLCANIC ROCK. SOME GRAY SCHIST, QUARTZITE AND OCCASIONAL QUARTZ. A MARKED CHANGE FROM SAMPLE 24.
26.	467 FEET.	VOLCANIC BOULDERS IN LIGHT-COLORED RED CLAY. CUTTINGS OF DARK-RED VOLCANIC ROCK AND SOME GRAY QUARTZITE. SOME ROUNDED GRAVELS.
	473 FEET.	CUTTINGS, LIGHT AND DARK-COLORED VOLCANIC ROCKS. VERY LITTLE RED VOLCANICS AS AT 467 FEET. SOME SCHIST AND QUARTZ. MANY SMALL-ROUNDED GRAVELS.
	482 FEET.	CUTTINGS OF LIGHT AND DARK VOLCANIC ROCK. SOME LIGHT-COLORED VOLCANICS, QUARTZITE AND QUARTZ. ROUNDED PEBBLES.
	484 FEET.	CUTTINGS LIKE THOSE FROM 482 FEET.
27.	502 FEET.	GRAVEL AND RED CLAY. MOSTLY DARK-RED VOLCANICS, SOME RHYOLITE, ALSO ROUNDED PEBBLES. NOTE THAT THE DARK-RED CLAY CONTINUES.
	511 FEET.	VOLCANIC ROCKS, SCHIST AND OTHER META-SEDIMENTS. FINE GRAVELS EMBEDDED IN RED CLAY.
	510 FEET.	LIGHT-COLORED VOLCANIC ROCKS WITH MUCH SCHIST AND QUARTZITE.
28.	529 FEET.	DARK-PINK CLAY RECOVERED FROM BIT. THE CLAY CONTAINS ABOUT 5% FINE SAND OF SCHIST, QUARTZITE, AND QUARTZ. SOME GRAINS ARE WELL-ROUNDED.
	530 FEET.	LIGHT AND DARK VOLCANIC ROCK, QUARTZITE, QUARTZ AND SOME SCHIST.
	535 FEET.	CUTTINGS ARE MOSTLY QUARTZITE AND SCHIST WITH LITTLE VOLCANIC ROCK.

WELL LOG (CONT'D)

467 -	474 FEET.	BOULDERS AND GRAVEL. RED CLAY AT 472 FEET.
474 -	488 FEET.	A VARIETY OF BOULDERS WITH BUT LITTLE CLAY. A POSSIBLE SOURCE OF WATER.
488 -	502 FEET.	HARD BOULDERS IN BROWN AND RED SANDY CLAY.
502 -	529 FEET.	PINKISH-BROWN CLAY WITH SAND AND OCCASIONAL BOULDERS.
529 -	545 FEET.	BOULDERS IN PINK AND LIGHT-BROWN CLAY. SOME SERICITIC ROCK.
545 -	553 FEET.	BOULDERS IN CLAY. SOME ROUNDED GRAVELS.
553 -	567 FEET.	BOULDERS IN BROWN CLAY. YELLOW CLAY AND SMALL GRAVEL AT 561 FEET.
567 -	575 FEET.	LIGHT GRAY METAMORPHIC ROCKS. LARGE BOULDERS OR POSSIBLY BASEMENT ROCK.

SAMPLES FROM NUCLEAR ENGINEERING COMPANY WELL

1.	0-2 FEET.	SILT. PROBABLY WIND-BLOWN DUST.
2.	5 FEET.	COARSE GRAVELS AND SILT. VOLCANIC ROCKS, ANDESITE, BASALT, AND RHYOLITE. BENTONITIC CLAY FROM SOUTHERN AMARGOSA VALLEY. USED FOR MAKING UP DRILLING MUD.
3.	10 FEET.	DOMINANTLY VOLCANIC ROCKS, SOME QUARTZ.
4.	25 FEET.	VOLCANIC GRAVEL WITH SOME QUARTZ AND CHALCEDONY.
5.	47 FEET.	VOLCANIC GRAVELS. SOMEWHAT ALTERED AND SILICIFIED.
6.	100 FEET.	GRAVELS OF VOLCANIC ROCKS.
7.	107 FEET.	MOSTLY GRAVELS OF VOLCANIC ROCKS AND SOME QUARTZ.
8.	117 FEET.	VOLCANIC GRAVELS PARTLY WELL ROUNDED.
9.	145 FEET.	LARGELY RHYOLITIC GRAVELS. SOME QUARTZITE.
10.	147-148 FEET.	GRAVELS OF VOLCANICS AND QUARTZITE.
11.	160 FEET.	VOLCANIC ROCKS, ALTERED VOLCANICS, AND SOME QUARTZ.
12.	171 FEET.	TWO-THIRDS VOLCANICS AND ABOUT ONE-THIRD SCHIST WITH SOME WELL-ROUNDED PEBBLES.
13.	181 FEET.	VOLCANIC ROCKS, QUARTZITE, SCHIST, QUARTZ, AND CHALCEDONY. A FEW WELL-ROUNDED PEBBLES.
14.	202 FEET.	PEBBLY ORANGE-COLORED CLAY FROM CORING BIT. WELL ROUNDED PEBBLES OF VOLCANIC ROCKS. NOTE CHANGE TO VOLCANICS WITH NO SEDIMENTS.
15.	206 FEET.	LIGHT BROWN CLAY FROM CORING BIT WITH ABOUT 5% OF SAND.
16.	224 FEET.	CUTTINGS ARE DOMINANTLY VOLCANICS AND SOME QUARTZITE AND CHALCEDONY.
17.	250 FEET.	FINE CLAYEY GRAVELS. GRAVELS CHIEFLY OF VOLCANIC ROCKS WITH SOME QUARTZITE, SCHIST, AND QUARTZ.
18.	267 FEET.	YELLOW TO LIGHT-BROWN CLAY.
19.	276-277 FEET.	LIGHT-BROWN CLAY FROM CORE BARREL. CONTAINS BUT LITTLE SAND.

NUCLEAR ENGINEERING CO. INC.

COPY 600' S. OF N/4 COR 35 - 13 - 47 COPY

WELL LOG

0 -	2 FEET.	SILT. PROBABLY WIND-BLOWN DUST.
2 -	5 FEET.	COARSE GRAVEL WITH SOME SILT.
5 -	30 FEET.	COARSE GRAVEL WITH SOME BOULDERS.
30 -	45 FEET.	FINE GRAVEL WITH LARGE BOULDERS. BOULDER BED AT 45 FEET.
45 -	100 FEET.	COARSE GRAVEL WITH SOME BOULDERS AND SAND.
100 -	102 FEET.	BOULDERS IN COARSE GRAVEL.
102 -	107 FEET.	BOULDERY CLAY.
107 -	117 FEET.	BOULDERY CLAY; ABOUT HALF CLAY
117 -	147 FEET.	SMALL GRAVEL WITH BROWN SANDLY CLAY.
147 -	148 FEET.	BOULDERS IN BROWN SANDY CLAY.
148 -	157 FEET.	BOULDERS WITH SOME CLAY.
157 -	161 FEET.	BOULDERS AND GRAVEL IN ORANGE-COLORED CLAY.
161 -	171 FEET.	ORANGE-COLORED CLAY.
171 -	181 FEET.	REDDISH-ORANGE CLAY.
181 -	199 FEET.	CORED IN BENTONITIC RED AND ORANGE-COLORED CLAY. NO CORE RECOVERY.
199 -	202 FEET.	CORED. NO CORE RECOVERED. BROWN CLAY FROM BIT.
202 -	206 FEET.	CORED. NO CORE RECOVERED. CONSIDERABLE BROWN CLAY FROM BIT.
206 -	235 FEET.	CLAYEY GRAVEL, WITH BOULDERS, BROWN CLAY, AND SMALL GRAVEL AT 235 FEET.
235 -	258 FEET.	FINE CLAYEY GRAVEL. PINKISH CLAY.
258 -	265 FEET.	GRAVEL AND BOULDERS WITH BUT LITTLE CLAY.
265 -	274 FEET	BROWN AND YELLOW CLAY WITH SOME GRAVEL.
274 -	280 FEET.	CORED. RECOVERED 5 FEET OF LIGHT BROWN CLAY
280 -	302 FEET.	BROWN CLAY WITH OCCASIONAL BOULDERS.
302 -	308 FEET.	WHITE AND BROWN BENTONITIC CLAY WITH LAYERS OF BRIGHT-YELLOW CLAY.
308 -	322 FEET.	BROWN SWELLING-CLAY WITH SOME GRAVEL. MOSTLY CLAY FROM 265-322 FEET.
322 -	324 FEET.	BOULDERS IN BROWN SANDY CLAY.
324 -	326 FEET.	YELLOW CLAY.
326 -	340 FEET.	BOULDERS BUT WITH LITTLE CLAY. POSSIBLE WATER ZONE.
340 -	349 FEET.	WHITE TO BROWN CLAY. WHITE ARGILLACEOUS CARBONATE ROCK ALTERED TO CLAY.
349 -	356 FEET.	WHITE CARBONATE ROCK. LARGELY ALTERED TO CLAY FROM 355-356 FEET.
356 -	368 FEET.	BOULDERY BROWN CLAY.
368 -	370 FEET.	WHITE CLAY, BROWN CLAY, AND SMALL GRAVEL.
370 -	384 FEET.	DARK VOLCANIC BOULDERS WITH BROWN BENTONITIC SANDY CLAY.
384 -	406 FEET.	WHITE CARBONATE ROCK SOMEWHAT ALTERED TO CLAY.
406 -	425 FEET.	GREENISH-BROWN CLAY, SOME BOULDERS.
425 -	435 FEET.	WHITE CARBONATE ROCK AND WHITE CLAY.
435 -	445 FEET.	BOULDERS IN RED CLAY.
445 -	467 FEET.	HARD BOULDERS WITH GRAVEL IN DARK-RED CLAY. VOLCANIC ROCKS.

Dean
Jason

Reynolds Electrical & Engineering Co., Inc.

Post Office Box 98521 • Las Vegas, NV 89193-8521

IN REPLY REFER TO:
580-01-379

WBS 1.2.3.5.2.1
QA: N/A

April 20, 1993

Branch Manager
Division of Water Resources
State of Nevada
Mailroom Complex
Las Vegas, NV 89195-0803

WELL DRILLER'S REPORT, PERMIT M/O-501

Enclosed you will find the subject report.

If you have any questions, please contact me at 794-7560.

R. F. Pritchett, Manager
Yucca Mountain Project Division
YMP Technical Project Officer

RFP:mab

Enclosure
1. Well Driller's Report,
   Permit M/O-501 (42 pages)

cy w/o encl.
C. J. Mason, REECo, M/S 751

cy w/encl.
Information Services Center, M/S 408
L. M. Smith, DOE/NV, M/S 505

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