DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division
P.O. Box 036, FBUSCH
550 W. Fort Street
Boise, Idaho 83702

Attn: M Knapp / N Coleman
WM 623-SS

WSB

July 16, 1973

Mr. O. E. Elgert, Director
Production and Waste Management
Programs Division
Richland Operations Office
U.S. Atomic Energy Commission
Box 550
Richland, Wash. 99352

Dear Mr. Elgert:

Included herewith for your information and file is a summary record of water-level measurements made in the deep piezometers on and near the Hanford Reservation.

The Geological Survey took responsibility for measuring water levels in these piezometers in connection with the deep mine storage program for the purpose of obtaining static heads at specific depths in the basaltic rocks. These data were needed to compare with data obtained during the drilling and testing at well ARH-DC-1 to evaluate the effects of drilling and pumping on short term packer tests.

In examining the data, please note the following pertinent points:

(1) Piezometer 4 in ARH-DC-1 shows a consistent decline in head for the period of measurement indicating that the effects of drilling are very long-lived or that the piezometer is poorly connected, hydraulically, with the aquifer (partially plugged screen or sand pack).

(2) Piezometer DH-4 water-level measurements are anomalously high and have declined for the period of record, suggesting that this piezometer is plugged.

(3) Water level trends in ARH-DC-1 piezometers (except number 4) and piezometer DDH-3 have been generally similar since January 1973.

(4) Head in ARH-DC-1 piezometers apparently increases with depth. The opposite trend was obtained from water-level measurements made during drilling.

WM Record File 101
WM Project 101
Docket No.
PDR ✓
LPDR ✓
Distribution: REB LH CR
MJB LB JK
JDB HM RW
(Return to WM 623-SS) MK NColeman C²

RECEIVED IN THE OFFICE
AUG 20 1973
OF R. E. ISAACSON

8409200370 840804
PDR WASTE
WM-10 PDR

00948

The U.S. Geological Survey measurement of water levels in these piezometers terminated with the closing of our Richland office in June, 1973, and the following recommendations are therefore made:

(1) Water-level measurements should be continued in these piezometers at not longer than monthly intervals for the next two years to verify that natural conditions obtain and to observe the trends at water levels at depth in the basalt on and near the Hanford Reservation.

(2) Well development procedures (swabbing, pumping) be instituted as quickly as possible in piezometer DH-4 and in ARHDC-1 piezometer 4 in one year, if the historical trend in water-level change continues.

(3) At intervals of approximately 5 years, suitable testing be done to ascertain that piezometers are open only to the zones in which they have been completed.

Very truly yours,

A. M. La Sala, Jr.

A. M. La Sala, Jr.
Research Hydrologist

cc: Regional Hydrologist, WR, Menlo Park, Calif.

RECEIVED
JUL 26 1973
A.E.C. RL OFFICE
PROD. PROGRS. DIV.

See folder for Memo to Knapp/Coleman Frm. Cook 8-9-84

101

Table.--Summary record of depths to water, below land surface in feet, for piezometers on and near the Hanford Reservation, Washington.

Piezometer designation / Date	DDH-3	DH-4	DH-5	ARHDC-1 #1 open 4750-4849	ARHDC-1 #2 open 3930-4051	ARHDC-1 #3 open 3177-3242	ARHDC-1 #4 open 2913-2987	ARHDC-1 #5 open 1219-2105
8-24-70	14.61							
9-23-70	14.91							
2-24-71	15.43							
6-8-72	14.47			157.20				
6-22-72	14.46							
6-29-72	14.77			157.33	158.02	158.39	141.37	163.00
7-6-72	14.60			157.05	157.71	158.10	142.33	162.82
7-13-72	14.82			157.02	157.63	158.00	143.40	162.94
7-20-72	14.76	42.00		156.91	157.50	157.90	144.24	163.00
7-26-72	14.77			156.85	157.44	157.83		162.87
8-2-72	14.81	42.03						
8-10-72	14.70			157.07	158.00	158.38	146.42	162.78
8-17-72	14.81	42.10	382.68	157.34	158.21	158.58	147.18	162.88
8-24-72	14.65			157.27	158.00	158.42	147.75	162.82
8-30-72	14.80			157.45	158.17	158.52	148.28	162.30
9-7-72	14.58	42.28	382.57	157.25	157.88	158.25	148.81	162.81
9-21-72	14.38			156.97	157.57	157.94	149.69	162.83
9-28-72	14.65			157.52	157.75	158.07	150.29	163.06
10-5-72	14.82	42.45	382.93	157.36	157.88	158.25	150.80	163.22

101
8-9-84

Piezometer designation	DDH-3	DH-4	DH-5	ARHDC-1 #1 open 4750-4549	ARHDC-1 #2 open 3930-4051	ARHDC-1 #3 open 3177-3242	ARHDC-1 #4 open 2913-2987	ARHDC-1 #5 open 1219-2105
10-12-72	14.77			157.27	157.78	158.14	151.13	163.26
10-19-72	14.45			156.88	157.40	157.79	151.25	163.05
10-26-72	14.29			156.67	157.20	157.56	151.44	162.94
11-2-72	14.42			156.74	157.30	157.69	151.80	163.08
11-9-72	14.32			156.62	157.17	157.52	151.93	163.04
11-16-72	14.17			156.45	157.00	157.35	151.99	162.88
11-30-72	14.38			156.60	157.13	157.51	152.65	163.23
12-20-72	14.21							
1-3-73	14.11			156.37	156.88	157.30	153.19	163.08
1-19-73	13.95			156.08	156.63	157.02	153.23	162.83
2-22-73	13.84			156.19	156.78	157.17	153.95	163.06
3-15-73	13.77			156.13	156.70	157.11	154.15	163.05
3-30-73	13.49			155.87	156.42	156.85	154.27	162.89
4-12-73	13.44			155.81	156.37	156.80	154.50	162.88
4-26-73	13.50			155.86	156.43	156.86	154.73	162.98
5-10-73	13.62			155.98	156.55	157.00	154.98	163.03
5-24-73	13.16			155.46	156.06	156.51	154.90	162.71
6-4-73	13.49			155.75	156.32	156.78	155.21	162.91
12-30-74				155.73	156.26	156.67	158.90	162.56
4-18-75				155.28	155.60	156.35	163.70	162.24
4-24-75							163.71	

added later FCL 8/9/84

NOTE: Reference elevation for land surface for ARHDC-1 is 572.18 ', United States Coast & Geodetic datum.