



United States Department of the Interior

GEOLOGICAL SURVEY

Yucca Mountain Project Branch
101 Convention Center Drive, Suite 860
Las Vegas, NV 89109



WBS: 1.2.3.3.1.3.1

QA: "QA:"

May 8, 1990

Mr. Carl P. Gertz, Program Manager
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

Subject: Response to State of Nevada Concern re: Changes in Continuous
Water-Level Data Network

Dear Carl:

In March, 1990, the Yucca Mountain Project-U.S. Geological Survey (YMP-USGS) made a presentation at the American Institute of Hydrology (AIH) meeting in Las Vegas on the use of water-level monitoring to characterize Yucca Mountain. At that meeting the YMP-USGS indicated that, for the purpose of computing hydraulic properties, continuous data at one site, for a period of 3-6 months were sufficient. This means that there must be an uninterrupted, hourly record of valid water levels for the above period. Because routine and expected instrumentation problems are likely to lead to some uncertain readings, several years are likely to be required to obtain a complete 6-month period of continuous data. Nevertheless, where the YMP-USGS has collected sufficient data to have a complete 6-month period of record to determine hydraulic properties, we may rotate continuous water-level instrumentation to other sites. Such decisions will be evaluated on a case-by-case basis.

At the AIH meeting, the YMP-USGS also indicated fairly specific future plans to convert selected sites from the continuous network to the periodic network. This plan was formulated because continuous water-level data sufficient for YMP needs are already available for these sites and additional data collection is not likely to improve determination of hydraulic properties based on water-level fluctuations. Consequently, we need to consider whether resources dedicated to these sites could better be utilized elsewhere in the water-level network. This plan has been under discussion for a considerable period of time. It is discussed in Study Plan 8.3.1.2.3.1, "Characterization of the Yucca Mountain site saturated-zone ground-water flow system", which has been extensively reviewed by the Department of Energy (DOE) Yucca Mountain Project Office and the DOE Office of Civilian Radioactive Waste Management.

In a letter from Robert R. Loux dated April 3, 1990 (attached), the State of Nevada indicated that long periods of continuous water-level records were required in order to ascertain recharge to the system. They suggested that the YMP-USGS purchase additional automated stations rather than moving existing equipment to new sites. It is not clear from their letter whether the State of

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Nevada realizes that the YMP-USGS will continue to periodically measure the wells that are planned to be removed from the automated continuous network. Further, although wells in the periodic network are currently measured monthly, this frequency is subject to change if warranted by data needs. It is possible that periodic measurements at some frequency may be as good as continuous measurements for the State's purpose. Therefore I would suggest that the State provide a more detailed plan for this analysis of water-level data to ascertain recharge. Such a plan should address frequency and duration of data needed for the analysis as well as required accuracy and precision. With such a plan, the YMP-USGS would be able to determine if it would be feasible to modify the YMP-USGS network to obtain data required by both the State and the YMP.

The State's request that the DOE and YMP-USGS "purchase additional automated stations" implies that additional automated stations can be established and operated at minimal cost. This is not the case because initial equipment purchases are only a small part of the cost of maintaining the automated network. A new station could be established for about \$5,000 in initial equipment costs and less than \$1,000 in personnel costs. However, operations of a single automated station for one year costs about \$3,000 for equipment maintenance and \$14,000 for personnel.

While the YMP-USGS has had plans for some time to modify the water-level network, such modifications are not imminent. Evaluation of existing data likely will continue for several more months. Only after this evaluation is completed will the network be modified. This period will easily allow the State to further define its needs. During this period, the above mentioned study plan will go to the Nuclear Regulatory Commission (NRC) for review and they will have sufficient time to react to the plan prior to changes being made in the network.

Sincerely,



Larry R. Hayes
Technical Project Officer
Yucca Mountain Project Branch
U.S. Geological Survey

Attachment: Letter from Loux to Gertz dated 4/3/90

cc: E. Roseboom, USGS/Reston
N. Trask, USGS/Reston
J. Czarnecki, USGS/Denver
R. Luckey, USGS/Denver
D. Galloway, USGS/Denver
B. Ervin, USGS/Denver
D. Gillies, USGS/Denver
R. Barton, DOE/Las Vegas
D. Deere, NWTBR
B. Browning, NRC
D. Moeller, NRC-ACNW
D. Weigerl, GAO
YMP-USGS LRC 1.1.01

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Governor

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April 3, 1990

Mr. Carl P. Gertz
Program Manager
Yucca Mountain Project Office
Department of Energy
P.O. BOX 98518
Las Vegas, NV 89193-8518

Dear Mr. Gertz:

One of our consultants recently attended a meeting of the American Institute of Hydrology (AIH) in Las Vegas. At that meeting a presentation was given on the saturated zone ground water monitoring network by the USGS. The focus of the particular talk was on the USGS use of these data. It is our understanding the USGS's focusing on collecting "short term" data for use in calculating such things as hydraulic properties, barometric and earth tide effects. Certainly this is an extremely important end use, but it is only one important use.

The State of Nevada, on the other hand, has been looking at "longer term" aspects of this same data base. One of our projects involves ascertaining recharge to the system by examining long term water table fluctuations (periodicity). We naturally desire as long of a period of record as is possible, (i.e. many years) which leads to the point of this letter.

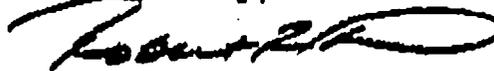
During the USGS presentation, the presenter described the two types of data recording methods, i.e. automated (pressure transducers) and manual (steel tape). The part of the talk found problematic is that the presenter indicated that the automated systems would be moved from hole to hole after collecting three to six months worth of data. This is the length of record needed for their calculations of hydraulic properties. However, this approach appears to sacrifice longterm data important for understanding the ground water flow system, and its dynamic, variations in ground water chemistry, and the aquifer systems reaction to other natural processes such as tectonics.

What we wish to convey to you is that this is an undesirable situation, not only from our project standpoint, but for others who may need to ascertain long term trends in the water table history as input into site performance evaluations. We therefore request:

- 1) That you purchase additional automated stations where needed rather than move the existing ones, and
- 2) discuss future monitoring locations with regulators and affected parties prior to any changes.

Your prompt attention to this matter will be greatly appreciated.

Sincerely,



Robert R. Loux
Executive Director

CAJ:jam

cc: Don Daere, NWTRB
Bob Browning, NRC
Dade Moeller, NRC-ACNW
Dwayne Weigel - GAO