



**Department of Energy**  
Office of Civilian Radioactive Waste Management  
Yucca Mountain Site Characterization Office  
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JUN 16 1995

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**ANSWER TO CONCERNS ON PREMATURE TUNNEL BORING MACHINE (TBM)  
ADVANCE (SCPb: N/A) (ACTION NN1-1995-0474)**

Please consider the following discussion as our response to the major concerns stated in your letter of May 11, 1995.

In regard to your concern that premature TBM advance through the Paintbrush Tuff non-welded (PTn) geologic contact could result in permanent and irretrievable loss of pneumatic data, and may prevent the U.S. Nuclear Regulatory Commission (NRC) from making a licensing finding, we believe the NRC letter from Greeves to Milner, dated May 12, 1995, clearly addresses this concern. The following quotes taken from the Greeves letter specifically address this issue:

Page 5, Paragraph 4 -

"the NRC staff desires to point out that the post-closure performance objectives of 10 CFR 60.113 do not specifically limit gaseous radionuclide or vapor movement travel times from a high-level waste repository. In NRC regulations, the words 'fastest pathway' only apply to the groundwater travel time requirements of 10 CFR 60.113(a) (2) and 122(b) (7)."

Page 6, last entry -

"1. The technique of collecting soil gas pressure data in response to barometric pressure changes from the land surface is not necessary to license the site."

Your comments regarding the criteria for lifting the hold on the TBM are discussed in detail in the above referenced letter. As previously stated, the "hold" criteria reads:

"The TBM shall not excavate beyond the TCw/PTn (Tiva Canyon welded/Paintbrush Tuff non-welded) geologic contact until after collection of pneumatic data from monitored boreholes. This hold shall be rescinded when:

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- \* Pneumatic data have been collected from isolated intervals in the Tiva Canyon welded unit (TCw), the Paintbrush non-welded unit (PTn), and the Topopah Spring welded unit (TSw).
- \* Data have been collected over a time period equivalent to early to late winter (this period is anticipated to be completed by late February).
- \* Data for several barometric pressure changes (weather fronts) have been gathered, or an alternative testing program that meets the above objectives is developed."

As you will note, the hold criteria is based on the collection of data.

The pneumatic pathways testing data which is being collected will be archived in the U.S. Department of Energy (DOE) Technical Data Base. As you know, it is DOE's intent to make data available to all parties as expeditiously as possible within a framework that ensures the integrity of the data and is in accordance with our contractual relationships with the participant organizations. Any interested parties may request copies of this data by submitting a request, as was done by Nye County in March of 1995. The initial "raw" data from NRG-6 and NRG-7a will be available for distribution in early June 1995, and a letter report summarizing this data is a milestone scheduled for delivery by the end of June 1995. We will honor Nye County's March 21, 1995, formal request as soon as the data is available for distribution.

Pursuant to Nye County's inquiries, we are addressing their concerns about the quality of the air permeability testing program. A third party review is presently being conducted, and results should be available before the end of June 1995. As Nye County is well aware, however, the air permeability testing program is a separate program from the pneumatic monitoring program and has no bearing on the quality of data obtained from in-situ pneumatic monitoring.

Nye County's assertion that "there has been no gas chemistry data collected from any boreholes to date . . ." is incorrect. Nye County is directed to the paper "Monitoring the Vadose Zone in Fractured Tuff, Yucca Mountain, Nevada" in Proceedings of the NWWA Conference on Characterization and Monitoring of the Vadose (Unsaturated) Zone, November 19-21, 1985, Denver Colorado (National Water Well Association, Worthington, Ohio, pages 439-469). This paper details work conducted by Dr. Parvis Montazer (currently a contractor to Nye County) and associates in Borehole USW UZ-1, including unsaturated zone gas sampling. Other boreholes from which we have gas chemistry data are listed in Enclosure 1. This data has been reported in the Technical Data Catalog published quarterly by the Yucca Mountain Site Characterization Office, three copies of which are provided to Nye County on a regular basis. Access to this information can be obtained by contacting the Technical Data Base Coordinator, Claudia M. Newbury, of DOE at (702) 794-7942.



# United States Department of the Interior



GEOLOGICAL SURVEY  
 BOX 25046 M.S. \_\_\_\_\_  
 DENVER FEDERAL CENTER  
 DENVER, COLORADO 80225

IN REPLY REFER TO:

Informal Memorandum

May 19, 1995

*D 25-22-95*  
 To: Dan Gillies, Chief, UZ and Infiltration Studies Team

From: Gordon Rattray, Hydrologist, ESIP GR 5-19-95

Subject: Gas and water vapor data collected by the UZ  
 Hydrochemistry Project at Yucca Mountain, Nevada  
*(WBS 1.2.3.3.1.2.7)*

The following table lists the boreholes that the UZ Hydrochemistry Project has collected gas and water vapor samples from. The type of data collected and the year of collection is also listed.

<u>Borehole</u>	<u>Type of data</u>	<u>Years collected</u>
NRG-6	SF <sub>6</sub> , CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>18</sup> O, <sup>14</sup> C	1994
NRG-7/7A	SF <sub>6</sub> , CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>18</sup> O, <sup>14</sup> C	1994
SD-12	SF <sub>6</sub> , CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>18</sup> O, <sup>14</sup> C	1994
UZ-1	SF <sub>6</sub> , CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>18</sup> O, <sup>14</sup> C, D/H	1983 to 1995
UZ-16	SF <sub>6</sub> , CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>18</sup> O, <sup>14</sup> C	1994

cc: Al Yang

ENCLOSURE



United States Department of the Interior

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May 22, 1995

MEMORANDUM

*DY 5-22-95*

TO: Daniel Gillies, Unsaturated Zone and Infiltration Studies Team Chief, Earth Science Investigations Program, YMPB

FROM: Gary Patterson, Hydrologist, Earth Science Investigations Program, YMPB *to for Gary Patterson 5/22/95*

SUBJECT: Gas Chemistry Data Collected by the North Ramp/ESF Gas Phase Circulation Project at Yucca Mountain, NV. *(WBS 1.2.3.3.1.2.6)*

The following table lists boreholes the Gas Phase Circulation project has collected samples. Types of samples and collection periods are also included in the table. This table only references published data and data submitted to the Local Records Center. Additional data collected during FY 1995 is currently under review.

Borehole	Sample Type	Collection Period
N-27	CO <sub>2</sub> , CH <sub>4</sub> , <sup>14</sup> C	1994
N-62	CO <sub>2</sub> , CH <sub>4</sub> , <sup>14</sup> C	1994
N-64	CO <sub>2</sub> , CH <sub>4</sub> , <sup>14</sup> C	1994
N-71	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1987-1989, 1993 <sup>a</sup>
N-71	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-72	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1987-1989, 1993 <sup>a</sup>
N-72	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-73	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1997-1989, 1993 <sup>a</sup>
N-73	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-74	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1997-1989, 1993 <sup>a</sup>
N-74	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-75	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1997-1989, 1993 <sup>a</sup>
N-75	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-76	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1997-1989, 1993 <sup>a</sup>
N-76	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-93	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1987-1991, 1993-1994 <sup>a</sup>
N-93	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-93	SF <sub>6</sub>	1994
N-94	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1987-1991, 1993-1994 <sup>a</sup>
N-94	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-94	SF <sub>6</sub>	1994
N-95	CO <sub>2</sub> , CH <sub>4</sub> , <sup>13</sup> C, <sup>14</sup> C	1987-1991, 1993-1994
N-95	N <sub>2</sub> , O <sub>2</sub> , Ar	1987
N-95	SF <sub>6</sub>	1994

<sup>a</sup> No <sup>14</sup>C sample collected in 1987

Borehole	Sample Type	Collection Period
NRG-2B	CO2, CH4, <sup>13</sup> C	1994
NRG-4	CO2, CH4, <sup>13</sup> C	1994
NRG-5	CO2, CH4, <sup>13</sup> C	1994
NRG-6	CO2, CH4, <sup>13</sup> C	1994
UZ-6	CO2, CH4, <sup>13</sup> C	1986-1991, 1993-1994
UZ-6	<sup>14</sup> C	1989-1991, 1993-1994
UZ-6	F-11, F-12, F-113	1992-1993
UZ-6	N2, O2, Ar	1986-1987
UZ-6	SF6	1994-1995
UZ-6S	CO2, CH4, <sup>13</sup> C	1986-1991, 1993-1994
UZ-6S	<sup>14</sup> C	1987-1991, 1993-1994
UZ-6S	F-11, F-12, F-113	1992-1993
UZ-6S	N2, O2, Ar	1986-1987
UZ-6S	SF6	1994-1995

cc: Don Thorstenson

(WBS 1.2.3.3.1.2.6)  
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The question regarding the barometric and ventilation measurements in the Exploratory Studies Facility is presently being considered and can be more fully discussed at the upcoming NRC/DOE technical exchange regarding the pneumatic pathways issue.

If you have any questions regarding this letter, please contact Russell L. Patterson at (702) 794-7691.



Wesley E. Barnes  
Project Manager

AMSP:RLP-3539

Enclosure:

Ltr, 5/19/95, Rattray to Gillies,  
w/encl

cc w/encl:

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