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MEMORANDUM FOR: Malcolm R. Knapp, Chief
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FROM: R. John Starmer, Section Leader
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SUBJECT: TRIP REPORT - PENROSE CONFERENCE, ON "GEOCHEMISTRY OF THE ENVIRONMENT NEAR A HIGH-LEVEL NUCLEAR WASTE REPOSITORY," PORTLAND, OREGON, SEPTEMBER 9-14, 1984

PURPOSE

The purpose of the conference was to promote technical exchange between geoscientists involved in nuclear waste disposal and a group of speakers who have expertise in the experimental and theoretical technologies related to nuclear waste isolation but who may have never applied their expertise to the problem of nuclear waste isolation. Such exchanges are beneficial to the NRC because they help assure that theoretical and experimental approaches pertinent to determining safe nuclear waste disposal can be identified early. Early identification of these approaches provides time to obtain a consensus regarding appropriate theoretical and experimental protocol and to assume the highest technical quality to the data to be used for licensing.

The conference was divided into seven lecture and discussion sessions and a field trip. A detailed schedule of talks and list of speakers and participants are attached. The major points expressed during the conference were:

- o Important experimental studies will not be completed before licensing time. Most of the conferees were experimentalists with little appreciation for the time constraints mandated by law. They felt that the time constraints on licensing decisions are too severe.

FC	:WMGT	:WMGT	:WMGT	8502280660	841213		
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For further information, contact R. John Starmer (427-4541), Linda A. Kovach (427-4693) or John W. Bradbury (427-4055).

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Enclosures:

- 1. List of participants
- 2. Conference schedule

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ATE	:84/12/12	:84/12/13	:84/12/12	:	:	:	:

List of Participants to the Penrose Conference on the
"Geochemistry of the Environment Near a High-Level
Nuclear Waste Repository", September 9-14, 1984

Conveners

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CONFERENCE SCHEDULE

Monday, September 10, 1984

8:30 a.m.	Introduction to Conference	<u>D. G. Coles</u>
8:45	General Review of the Environment for a Saturated, Unsaturated, and Salt Repository from a Thermal- Hydrologic and Engineering Point of View	<u>J. O. Duguid</u>
9:30	Discussion	
10:00	Break	

Geochemical Environment of a Repository

SITE REPRESENTATIVES

10:20	• Basalt	J. Myers, BWIP
10:40	• Salt	T. L. Steinborn, ONWI
11:00	• Tuff	K. G. Knauss, NNWSI
11:20	• Granite	A. A. Bauer, OCRD
11:40	Discussion	
12:30	Lunch	

AFTERNOON FREE

Water Migration in a Thermal Field

7:00 p.m.	Porous Media	<u>J. D. Byerlee</u>
7:45	Discussion	
8:15	Fractured Media	<u>D. L. Norton</u>
9:00	Discussion	
10:00	End of Session	

Tuesday, September 11, 1984

Experimental Considerations

8:00 a.m.	Overview of Hydrothermal Experimentation	<u>H. L. Barnes</u>
8:45	Discussion	
9:15	Use of Sampling Hydrothermal Apparatuses to Assess Natural Hydrothermal Processes	<u>W. E. Seyfried, Jr.</u>
10:00	Discussion	
10:30	Break	
10:50	Use of Sampling Hydrothermal Apparatuses Applied to Nuclear Waste Testing and Natural Systems	<u>J. R. Holloway</u>
11:35	Discussion	
12:00	Lunch	

Experimental Considerations, continued

1:15 p.m.	Use of Flowing Autoclave Experiments for Investigating Water/Rock Interactions and Nuclear Waste Package Interactions	<u>J. Potter</u>
2:00	Discussion	
2:30	Theory, Interpretation and Problems Inherent in the Concept of Eh	<u>D. D. Runnells</u>
3:15	Discussion	
3:45	Break	
4:05	Control and Monitoring of Eh and pH in Hydrothermal Experimentation	<u>G. C. Ulmer/ D. E. Grandstaff</u>
4:50	Discussion	
5:30	End of Session	

Wednesday, September 12, 1984

Field trip to Ruth Mine area of the North Santiam Mining District of the Western Cascades of Oregon to investigate the character and controls on hydrothermal alteration.

M. L. Cummings and
J. M. Pollock

Thursday, September 13, 1984

8:00 a.m.	Low Temperature Diagenetic/ Metamorphic Reactions	<u>W. F. Giggenbach</u>
8:45	Discussion	
9:15	Kinetic Reaction Models Applied to Hydrothermal Reactions Within a Nuclear Waste Repository	<u>W. E. Dibble, Jr.</u>
10:00	Discussion	
10:30	Break	
10:50	Geochemistry of Metal Corrosion and Transport	<u>T. M. Seward</u>
11:35	Discussion	
12:00	Lunch	
AFTERNOON FREE		
6:15 p.m.	Hydrothermal Systems-Analogies to Nuclear Waste Repositories	<u>R. M. Capuano</u>
7:00	Discussion	
7:30	A Natural Analogue of a Salt Repository, the Salton Sea Geo- thermal Field, Imperial Valley, California	<u>W. A. Elders</u>
8:15	Discussion	
8:45	Mineralogy and Geochemistry of Hydro- thermal Alteration at Glass Buttes, South Central Oregon - a Potential Analogy for a Basalt Repository	<u>M. L. Cummings</u>
9:30	Discussion	
10:00	End of Session	

Friday, September 14, 1984

8:30 a.m. Wrap-up Session
12:00 Lunch
2:00 - Informal discussion for participants with late
4:00 airline schedules

Field Trip

The field trip is being lead by Dr. Michael Cummings and graduate student Mike Pollock, both from Portland State University. The route for this trip will be south along the west side of the Cascades to the North Santiam River mining district. Mike Pollock is currently doing field work in this area and will show the conference participants some interesting hydrothermal ore deposits. The conference focuses on the similarity between natural hydrothermal geochemistry and that induced by a nuclear waste repository. The field trip will allow participants to investigate an example of a natural hydrothermal area. The round-trip distance is about 300 miles through some of Oregon's most beautiful mountain scenery. Vans will be required for transportation because the roads near the field area are not wide enough for buses.

Location

The conference site we have selected is the Rippling River Resort located on the southwest flank of Mount Hood in northern Oregon. The resort is located 35 miles east of Portland, Oregon at Welches, OR. It has new meeting and convention facilities. It is a place of beauty and of considerable interest to the geologist and geochemist.

A professional meeting coordinator (Lois Elms) has been contracted by GSA assist us in setting up the conference.

Date

The date of the conference is September 9-14, 1984.

Number of Participants

The number of participants to the conference will be limited to about 70, including the speakers.

Sponsors

The NRC, DOE's Pacific Northwest Laboratory, and the DOE Office of Basic Energy Science provided funds to help defray the cost of this conference.

The co-sponsors recognize that no publications will result from this conference and that the content of the conference will be solely determined by the conveners, GSA, and the speakers.

Conveners

David G. Coles	-	Pacific Northwest Laboratory
Michael J. Apted	-	" " "
Floyd N. Hodges	-	" " "
Donald H. Alexander	-	Department of Energy/Headquarters

Coles, Hodges, and Alexander are members of GSA.