MASTER

Basalt Waste Isolation Program Monthly Report

February 1978

Prepared for the United States
Department of Energy
Under Contract EY-77-C-06-1030

Rockwell International

Atomics International Division
Rockwell Hanford Operations
Richland, WA 99352

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

Rockwell International

**Atomics International Division
Rockwell Hanford Operations
Richland, WA 99352**

**PREPARED FOR THE UNITED STATES DEPARTMENT OF ENERGY
UNDER CONTRACT EY-77-C-06-1030**

PRELIMINARY REPORT

This Report contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final Report. It was prepared primarily for internal use within The Rockwell Hanford Operations. Any expressed views and opinions are those of the Author and not necessarily of the Company.

NOTICE

This Report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their Employees, nor any of their Contractors, Subcontractors, or their Employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

Informal Report

WASTE ISOLATION PROGRAM
MONTHLY REPORT

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

R. A. Deju, Director
Waste Isolation Program

February 28, 1978

Rockwell International
Atomics International Division
Rockwell Hanford Operations
Richland, Washington 99352

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

ZAB

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	3
PROGRAM SUMMARY	4
GEOTECHNICAL	
GEOLOGY	5
HYDROLOGY	6
WASTE/BASALT INTERACTION	7
RISK ASSESSMENT	8
ENGINEERING	
DRILLING AND CORING	9
ROCK MASS PROPERTIES AND MODELING	10
FACILITIES PROJECTS	11
SUPPORT	
PUBLIC AFFAIRS	12
QUALITY ASSURANCE	13
PROGRAM MANAGEMENT	14
PROGRAM BUSINESS MANAGEMENT	15
PROGRAM PLANNING AND SUPPORT	16
MANPOWER SUMMARY	17
VISITORS	18
TRAVELERS	19
DISTRIBUTION	20

INTRODUCTION

In February 1976, the U. S. Energy Research and Development Administration (currently the U. S. Department of Energy) expanded the commercial radioactive waste management programs and established the National Waste Terminal Storage Program. Its mission was to provide multiple facilities in various deep geologic formations within the United States. The Office of Waste Isolation was established within the Union Carbide Corporation-Nuclear Division to provide program management to the National Waste Terminal Storage Program. The overall program consisted of investigating a number of geologic rock types to determine their suitability for terminal storage of radioactive waste. Basalts, such as the Columbia Plateau basalts which underlie a large portion of the Pacific Northwest and the Hanford reservation, were selected for initial geologic reconnaissance. Atlantic Richfield Hanford Company was asked in May 1976 by the Office of Waste Isolation to plan and execute a basalt feasibility study. Geologic exploration of Columbia Plateau basalts was needed to determine the feasibility of utilizing those formations as a site for terminal storage of commercial nuclear waste.

In September 1977, the National Waste Terminal Storage Program (now the U. S. Terminal Storage Program) was restructured. While emphasis was still on a salt repository, additional funds were given to support investigations of two U. S. Department of Energy Sites (Hanford and Nevada).

The Hanford program is the responsibility of the U. S. Department of Energy-Richland Operations Office. Rockwell Hanford Operations (successor to the Atlantic Richfield Hanford Company) established the Waste Isolation Program and chartered it with the responsibility for conducting the basalt feasibility studies. Rockwell Hanford Operations is the prime contractor responsible for the Hanford basalt studies. Programs reported here are divided into the categories listed below.

Program Summary

Geotechnical

- Geology
- Hydrology
- Waste/Basalt Interaction
- Risk Assessment

Engineering

- Drilling and Coring
- Rock Mass Properties and Modeling
- Facilities Projects

Support

- Public Affairs
- Quality Assurance
- Program Management
- Program Business Management
- Program Planning and Support

REPORTING PERIOD

PROGRAM SUMMARY

FEBRUARY 1-28, 1978

During the month, 20 square miles were mapped to a scale of 1:24,000 in the Saddle Mountains immediately north of Hanford. Twenty-six gravel pits within and adjacent to Hanford were given preliminary characterization and no tectonically induced structures were found. Approximately 1,800 wells have been identified in the Pasco Basin which penetrate basalt. Work is now progressing to identify those wells drilled below the Saddle Mountains-Wanapum Basalt contact. In the Waste/Basalt Interaction area, progress continued in isolating those interaction products which are primary hosts for various cations and anions. Hydrologic Hole DC-5 was completed at 3,990 feet on February 9, 1978, approximately two weeks ahead of schedule. Borehole DC-6 is presently coring on schedule at 2,583 feet, with a planned total depth of 4,800 feet.

Mine modeling studies have shown that, at depths of 3,000 feet, the probability of joint slip above the plane of the repository is very small. Design of heater instrumentation and design for the Near-Surface Test Facility continues. Procurement specifications are being prepared.

A Tectonics and Seismicity of the Columbia Plateau Workshop was held in Seattle, Washington, February 14-16, 1978.

MAJOR PROBLEMS AND ACTION TAKEN

- Some contracts have not been fully finalized.
 - Discussions are being held with subcontractors to assist them in meeting their originally planned milestones or in delaying selected milestones to a mutually agreed date.
- Additional funding from the U. S. Department of Energy to support the Near-Surface Test Facility construction and the heater testing program is needed by mid-March in order to meet stated milestones.
- Information has been submitted to the U. S. Department of Energy.

BUDGET VARIANCE

The total budget variance to date is .3 percent from the planned expenditure. A higher-than-expected rate of expenditure has occurred in the drilling program because of completion ahead of schedule of all rotary drilling operations. This positive variance cancels out a negative variance in the geology and hydrology programs due to slowness in processing some contracts.

WORK PACKAGE

GEOLOGY

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To formulate a regional geologic concept of the Columbia Plateau with emphasis on the geology of the Pasco Basin.

DESCRIPTION OF WORK ACCOMPLISHED

The regional mapping and stratigraphic modeling study of the Columbia Plateau basalts has been initiated by the U. S. Geological Survey under a "letter of intent" agreement. Eight major map areas have been outlined.

The Tectonics and Seismicity of the Columbia Plateau Workshop was held in Seattle, Washington on February 14-16, 1978. Over 60 professional geoscientists were in attendance. The proceedings of the meeting are currently being edited and will be ready for transmittal to the U. S. Department of Energy-Richland Operations Office.

Twenty square miles were geologically mapped in the Saddle Mountains immediately north of Hanford. Preliminary results indicate possible Pliocene uplift of the Saddle Mountains structure, leaving its tectonic stability an unresolved question. More than 1,000 fractures have been characterized to date in Boreholes DDH-3, DH-4 and DH-5 covering a cumulative drilled thickness of approximately 550 feet. This characterization is to assist in recognition of structures within the 20 ± basalt flows lying 2,000 to 4,000 feet beneath Hanford. Twenty-six gravel pits within and adjacent to Hanford were given preliminary characterization and no tectonically induced structures were found.

PROBLEM AREAS AND ACTION TAKEN

- Personnel arrangements cannot be finalized by either the Washington State Department of Natural Resources or the U. S. Geological Survey until contracts are let. The regional field work will, therefore, be hampered until the contracts are completed.
- A request to have the Washington State Department of Natural Resources and the U. S. Geological Survey contracts finalized by mid-March has been made.

PLANNED WORK FOR SUBSEQUENT MONTHS

Regional geologic mapping of Columbia River Basalt and overlying sediments is scheduled to begin in mid-March. Geologic surface and subsurface mapping, fracture analysis, and X-ray fluorescence analysis will continue. Contract seismic surveying is scheduled to commence in June.

WORK PACKAGE

HYDROLOGY

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To determine the nature of the regional hydrology of the Columbia Plateau and to define the regional and local hydrologic regimes of the Pasco Basin. To Design test tools that will allow definition of the hydrologic parameters of very impermeable rocks.

DESCRIPTION OF WORK ACCOMPLISHED

The U. S. Geological Survey continued drilling in the Umtanum Creek Well near Ellensburg, Washington and the George Well located at George, Washington. The Umtanum Creek Well was completed on February 10, 1978 to a total depth of 1,019 feet. The static water level remained at a constant 27 feet below land surface during drilling. Water temperature at completion was 26 degrees centigrade. Also completed, was the deepening of the George Well from 975 feet to 1,620 feet. Preliminary interpretation places this completion depth within the Grande Ronde Basalt Formation. The water level decreased from about 100 feet below land surface in the initial well to 400 feet upon deepening. The well's total water yield is uncertain, though it is estimated to be more than 1,000 gallons per minute. A pumping test is planned during which time the U.S. Bureau of Reclamation will monitor several nearby boreholes for water drawdown.

The Washington State Department of Ecology is continuing its compilation of regional hydrology data. During February, information on 200 new basalt wells was extracted from state files and recorded on the computer format used by the U. S. Geological Survey for keypunching into their data bank. These wells are located in Grant, Adams, and Lincoln counties. In addition, about 500 references have been gathered for the bibliography of the regional hydrology.

Approximately 1,800 wells have been identified in the Pasco Basin which penetrate basalt. Work is now progressing toward identifying those selected wells drilled below the Saddle Mountains-Wanapum Basalt contact. This effort will result in locating well sites available for future hydrologic testing or downhole geophysical studies.

Standard operating procedures were being drafted for the hydrology field testing program to begin in full operation later this spring. These procedures will cover both the sampling and analysis of water chemistry and the downhole testing for basalt permeabilities.

PROBLEM AREAS AND ACTION TAKEN

- Contractual procurement has delayed full implementation of contracts with the U. S. Geological Survey and the Washington State Department of Ecology.
- Discussions are being held with subcontractors and the U. S. Department of Energy.

PLANNED WORK FOR SUBSEQUENT MONTHS

Acquisition of field equipment and services will continue.

WORK PACKAGE

WASTE/BASALT INTERACTION

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To examine the reactions between basalt and spent unprocessed fuel and to evaluate the impact of these reactions on overall containment in a deep repository.

DESCRIPTION OF WORK ACCOMPLISHED

The Pennsylvania State University is making progress toward isolating those interaction products which are primary hosts for various cations and anions. For example: sodium is tied up in Na-wecksite and Na-pollucite; cesium occurs both in solution and in Na-wecksite; boron is being tied up in tincalconite (hydrated borate: $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$); and iron in acmite. Strontium zirconate (SrZrO_3) is believed to be the most likely Sr phase in spent unprocessed fuel. Mixtures of SrZrO_3 and plagioclase are being treated hydrothermally at 200 and 300 degrees centigrade to explore whether Sr can be mobilized from the zirconate and whether it would then be fixed by ion exchange with the plagioclase in basalt. After 7 days at 300 degrees centigrade/300 bars pressure, an apparent decrease in the X-ray crystallinity was observed, but no obvious interaction has been noted.

Lawrence Berkeley Laboratory has been supplied with 11 small samples of core alteration product material. These were taken from the 2,616- to 2,830-foot interval in DH-5. Microprobe sections have been made from each of the samples. Petrographic work is under way. Three types of alterations are being studied intensively with X-ray diffraction techniques. To date, cristobalite appears to be present in almost all the samples as a product phase. Several standard clays and zeolites have been obtained from Lawrence Livermore Laboratories.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

Atomic absorption analyses will increase from two elements to seven. Also, an analysis for uranium in solution is being initiated.

WORK PACKAGE

RISK ASSESSMENT

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To assess the risk of various terminal storage concepts for a basalt repository and to develop parameters necessary to support an acceptable repository design.

DESCRIPTION OF WORK ACCOMPLISHED

A request for proposals to perform a "Disruptive Event Analysis" for a geologic repository has been prepared. This analysis is the first phase of a three-phase conventional risk analysis approach which will include a "Transport Modeling" phase followed by a "Consequence Analysis" phase. This information will be utilized in the preliminary safety analysis report and the environmental report.

The "Environmental Assessment for the Near-Surface Test Facility" was completed and formally transmitted to the U. S. Department of Energy-Richland Operations Office. Environmental impacts due to construction and operation of the facility will be minor. The environmental assessment only covers the "heater testing" phase of the operation.

The literature search for new concepts in the risk analysis methodology field of study is 25 percent complete. Over 60 resources have been identified and are currently being reviewed. Emphasis is being placed on statistical techniques used in the new methodologies.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

A qualified contractor will be selected to perform a disruptive event analysis for a geologic repository. The "Environmental Assessment for Coring Wells ARH-DC-4, ARH-DC-6 and ARH-DC-8 and Drilling Wells ARH-DC-5 and ARH-DC-7" will be transmitted to the U. S. Department of Energy-Richland Operations Office. Testing of the three-dimensional model of contaminant transport from a line repository in a shattered section of dense rock will begin. This model is scheduled for completion in May 1978.

WORK PACKAGE

DRILLING AND CORING

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To supply the drilling structures needed for geologic and hydrologic testing of deep basalts and to furnish core samples for study of rock characteristics within the Pasco Basin.

DESCRIPTION OF WORK ACCOMPLISHED

Hydrologic Hole DC-5 was completed at 3,990 feet on February 9, 1978, approximately two weeks ahead of schedule. The entrance hole for DC-8 was completed at 690 feet on February 28, approximately 7 weeks behind schedule. The cable tool rig is presently moving to DC-4. Borehole DC-6 is presently coring on schedule at 2,583 feet, with a planned total depth of 4,800 feet.

PROBLEM AREAS AND ACTION TAKEN

- An artesian zone above the Umtanum Unit was exposed to a lost circulation zone below the Umtanum Unit just prior to reaching total depth of Hydrologic Hole DC-5.
 - An expandable rubber packer was run and set in the middle of the Umtanum Unit to prevent communication between zones.
- Cable tool progress at DC-8 is slower than expected due to caving sand and inclement weather.
- Protective casing will be onsite at subsequent wells and emplaced at first sign of hole problems.

PLANNED WORK FOR SUBSEQUENT MONTHS

A second core rig will mobilize to DC-8 for coring operations to 4,100 feet. The cable tool rig will move to DC-4 to prepare the entrance hole and set 6-inch casing to 500 ± feet. Core operations will continue at DC-6 into early April. Hydrologic testing efforts will commence in early May.

WORK PACKAGE

ROCK MASS PROPERTIES AND MODELING

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To determine the thermal and mechanical rock mass properties pertinent to the design and construction of a repository in basalt.

DESCRIPTION OF WORK ACCOMPLISHED

Work on Phase I of the mine modeling studies continued. Several analyses were performed, including: two-dimensional models of the regional response of a repository; axi-symmetric models of a single canister in basalt; and, three-dimensional analyses of parallel rows of one-kilowatt canisters in emplacement tunnels. The studies show that, due to the increased depth of a proposed repository in basalt, the probabilities of joint slip above the plane of the repository are reduced, resulting in safety factors of approximately two against joint failure.

Preliminary results of thermomechanical tests on basalt cores from DC-10 have been received. The results show average basalt strength and thermal properties.

Design of the heaters, instrumentation, and data acquisition system for the Near-Surface Test Facility heater tests continues at Lawrence Berkeley Laboratory. It was determined that the basic Stripa heater design (12-inch diameter) will be utilized for the Near-Surface Test Facility. Procurement specifications for the data acquisition equipment were received and purchase requisitions for capital equipment prepared.

Dr. J. F. T. Agapito and his associates prepared a cost estimate for the Near-Surface Test Facility tunnels and participated in the design review.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

The Phase I report, "Problem Definition and Code Review," will be received from the University of Minnesota and reviewed by Rockwell Hanford Operations. A final report on laboratory testing of Gable Mountain Core Hole DC-10 will be submitted by the Colorado School of Mines and reviewed by Rockwell Hanford Operations and Dr. J. F. T. Agapito. A preliminary design review of the heaters and instrumentation for the Near-Surface Test Facility will be held. Core from DH-4, DH-5, DC-11, DC-2, and DDH-3 will be sampled and shipped for testing.

WORK PACKAGE

FACILITIES PROJECTS

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To design facilities needed to prove the concepts of waste isolation in deep Columbia Plateau basalts. These facilities are to include the Near-Surface Test Facility with a spent fuel option and an underground repository.

DESCRIPTION OF WORK ACCOMPLISHED

Literature search and review of facility design information continued. Engineering criteria determinations for repository site selection have begun.

The design (Title I and II) of the Near-Surface Test Facility tunnels and excavations was revised by Rockwell Hanford Operations' Waste Isolation Program and a design review was held by Rockwell Hanford Operations on February 21, 1978. This design, for Phase I activity, consists of approximately 1,800 feet of underground workings, including two access tunnels, the test room, a computer room, and an extensometer room.

The design (Title I and II) of the electrical distribution line by Rockwell Hanford Operations' Utilities Function and Vitro Engineering was initiated. It has been determined that an existing line connecting the 251 Substation with the 100 Area Fire Station can be upgraded to meet part of the project needs. Approximately one and one-quarter miles of new line construction will be needed to connect this line to the Near-Surface Test Facility site on Gable Mountain.

An addition to the Engineering Study-Near-Surface Test Facility was prepared which incorporated changes made in the functional design criteria and conceptual design presented in the document.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

Engineering criteria for site selection will be determined. Waste form criteria development will continue.

A Project Management Plan and a Request for Directive are to be submitted to the U. S. Department of Energy-Richland Operations Office and, pending approval, a construction contract for the Near-Surface Test Facility tunnels and excavations will be issued by J. A. Jones Construction Company. The design of the electrical distribution line is to be completed, and the remaining design activity on the facility requirements and site work will be initiated.

WORK PACKAGE

PUBLIC AFFAIRS

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To assure timely communication of information from the Waste Isolation Program and to develop a resource library to hold and disseminate the information stemming from the program.

DESCRIPTION OF WORK ACCOMPLISHED

The Tectonics and Seismicity of the Columbia Plateau Workshop was held in Seattle, Washington as scheduled. A summary of recommendations from the workshop was compiled and work is continuing to document the workshop proceedings.

Tentative dates of May 3-5, 1978 have been selected for an internal review to discuss natural and engineered isolation of waste. Topics are being determined.

An overview of the Waste Isolation Program was prepared using slides and included in a waste management presentation to U. S. Representative Mike McCormack.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

Preliminary filming will begin for the basalt audio-visual presentation. Drafting of a script will begin.

Planning will continue for the natural and engineered isolation of waste review.

WORK PACKAGE

QUALITY ASSURANCE

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To administer the Waste Isolation Program quality assurance program, provide guidelines, reviews, checks, and controls for all program activities.

DESCRIPTION OF WORK ACCOMPLISHED

Surveillance/audits were conducted for the field activities portion of the ongoing drilling and coring program. Surveillance/audits were also conducted for data acquired in prior years in drilling and coring.

A review has been completed for inclusion of quality assurance requirements in two risk assessment contracts (fault tree and event tree). A draft of the Waste Isolation Program Quality Assurance Program Plan has been completed and is undergoing internal review.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

Surveillance/audits will be conducted of the administrative and records aspects of the drilling and coring program. A survey will be performed for the design and construction of the downhole laboratory.

A Quality Assurance program will be issued June 15, 1978.

WORK PACKAGE

PROGRAM MANAGEMENT

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To provide overall programmatic guidance to the Waste Isolation Program.

DESCRIPTION OF WORK ACCOMPLISHED

Work is proceeding on the Waste Isolation Program Management Plan. It will contain the management procedures to be used for controlling the program and activity networks which show the expected sequence of work through completion of each activity. The management plan will be completed by May 1, 1978.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

The Waste Isolation Program will be reviewed during April 1978 by a Rockwell International review team. Their main emphasis will be on the continuity of schedules and the management system.

Work will continue on the Waste Isolation Program Management Plan. As additional work areas are defined, program plans will be developed. Emphasis will be placed on the development of a program plan for in situ borehole plugging in basalt.

WORK PACKAGE

PROGRAM BUSINESS MANAGEMENT

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To support the budgetary and scheduling function. Assist in the preparation of program plans, work breakdown structures, and prepare and maintain work packages. Provide administrative support, reports, and liaison as required for the Waste Isolation Program.

DESCRIPTION OF WORK ACCOMPLISHED

Preparation of the five-year budget forecast (fiscal years 1978 through 1984), the budget request for fiscal year 1980/revised fiscal year 1979, and the Schedule 189 were completed.

PROBLEM AREAS AND ACTION TAKEN

No significant problem areas have been encountered.

PLANNED WORK FOR SUBSEQUENT MONTHS

Alternative schedule analysis will be initiated using E-Z-PERT and NASA PERT routines. These routines will provide rapid analysis of a delay in program activities, a change in program funding, or a change in program direction.

WORK PACKAGE

PROGRAM PLANNING AND SUPPORT

REPORTING PERIOD

FEBRUARY 1-28, 1978

OBJECTIVE

To support subcontracting activities, licensing activities, and other areas of planning and coordination as needed by the Waste Isolation Program.

DESCRIPTION OF WORK ACCOMPLISHED

Activity networks have been prepared for the safety analysis report and the environmental report activities. These activity networks will be incorporated into the Waste Isolation Program Management Plan.

The pending contracts for the Waste Isolation Program are as follows:

U. S. Department of Energy Processing - U. S. Geological Survey's Western Division and Water Resources Division, Pennsylvania State University and University of Minnesota (however, the universities have interim contracts in place);

Rockwell Hanford Operations Processing - Seismic Reflection Testing, Magnetotelluric in Basalt Survey, Paleomagnetic Analytical Service, Consultant Panel (F. Parker, I. Remson and A. Waters), Thin Sections, Neutron Activation Analysis, and, Disruptive Event Analysis;

Interim Contracts in Place - State of Washington Departments of Natural Resources and Ecology, Fenix and Scisson, Inc., and ENSCO, Inc.;

Contracts in Place - Dr. J. F. T. Agapito, W. K. Summers and Associates, Geoscience Research Consultants (two contracts), Lawrence Berkeley Laboratory, Colorado School of Mines, and P. R. Hooper.

PROBLEM AREAS AND ACTION TAKEN

- A U. S. Nuclear Regulatory Commission decision is needed regarding the contents of the environmental report and the safety analysis report for a repository.
- A draft of Title 10, Code of Federal Regulations, Chapter 60, is expected to be available for review during June 1978. Additional meetings with the U. S. Nuclear Regulatory Commission will be held in the near future.

PLANNED WORK FOR SUBSEQUENT MONTHS

Continue planning for fiscal year 1979 contractual requirements. Continue liaison with the U. S. Department of Energy and the U. S. Nuclear Regulatory Commission to define the licensing procedure.

REPORTING PERIOD

FEBRUARY 1-28, 1978

MANPOWER SUMMARY

	<u>Man-months</u>
<u>ROCKWELL HANFORD OPERATIONS</u>	50.0
<u>J. F. T. AGAPITO</u>	2.0
<u>BATTELLE NORTHWEST</u>	4.5
<u>BOEING COMPUTER SERVICES RICHLAND, INC.</u>	1.5
<u>COLORADO SCHOOL OF MINES</u>	3.0
<u>ENSCO, INC.</u>	5.0
<u>FENIX AND SCISSON, INC.</u>	15.0
Other Subcontractors	15.0
<u>GEOSCIENCE RESEARCH CONSULTANTS</u>	3.0
<u>LAWRENCE BERKELEY LABORATORY</u>	20.0
<u>PENNSYLVANIA STATE UNIVERSITY</u>	2.5
<u>W. K. SUMMERS AND ASSOCIATES</u>	2.0
<u>UNIVERSITY OF MINNESOTA</u>	10.0
<u>VITRO ENGINEERING</u>	5.0
<u>WASHINGTON STATE DEPARTMENT OF ECOLOGY</u>	1.0
<u>WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES</u>	2.0
 	<hr/>
TOTAL WASTE ISOLATION PROGRAM MANPOWER SUPPORT	<u>141.5</u>

REPORTING PERIOD

FEBRUARY 1-28, 1978

VISITORS

<u>Name</u>	<u>Affiliation</u>	<u>Date</u>	<u>Reason or Person Contacted</u>
T. L. Herb H. P. DeMuth L. A. Rugin	ENSCO, Incorporated	February 1	Meeting
P. Weber	W. K. Summers and Associates	February 1	R. Gephart
J. Bowers	Christensen Diamond	February 1	B. Carson
G. Bingwinith	Buhrke Company	February 2	S. Reidel
R. J. Johnston	Pennsylvania State University	February 3	M. Grutzeck
R. G. Charlwood	Acres	February 3	D. St. Laurent
L. H. Zimmis R. M. Bannister	Holmes and Narver	February 3	H. Dietz
D. Hause	Jenny Geotechnical Corporation	February 6	Meeting
P. Krevela	NEC	February 7	P. Long
B. Stromdahl M. McEvoy D. Rondeau E. Binnall S. Lundgren	Lawrence Berkeley Laboratory	February 8	M. Board
R. W. Lonkster	Lonkster Geophysical	February 9	Meeting
T. Doe S. Doty	Lawrence Berkeley Laboratory	February 9	R. Gephart
M. J. Szulinski J. A. Lauren	Science Applications Incorporated	February 9	Technical Discussion
V. Allen D. E. Wood	Kaman Sciences Corporation	February 9	Technical Discussion
R. W. Lonkster	Lonkster Geophysical	February 10	Geophysics Discussion
W. A. Kalk	Richland Engineering	February 10	Engineering Consulting
E. Boyle	Boyle Instruments	February 10	M. Grutzeck
R. Ramsdell	Drilling Fluid Specialists	February 10	B. Carson

REPORTING PERIOD

Visitors (continued)

FEBRUARY 1-28, 1978

<u>Name</u>	<u>Affiliation</u>	<u>Date</u>	<u>Reason or Person Contacted</u>
R. Allyn R. C. Leonard	Norpac Engineers	February 14	G. Evans
T. S. Harie J. F. Munro	Kaiser Engineers	February 15	Technical Discussion
D. J. Rondeau M. McEvoy	Lawrence Berkeley Laboratory	February 21	D. Mildon
D. Hansen	Jenny Geotechnical Corporation	February 21	A. Krug
J. Madsen	Atwood-Hinzman	February 23	R. Gephart
T. Doe J. Long	Lawrence Berkeley Laboratory	February 24	R. Gephart
T. R. Christie J. M. Bell	TRW	February 24	R. A. Deju
W. A. Rau	Westinghouse	February 27	Business

TRAVELERS

<u>Name</u>	<u>To</u>	<u>Date</u>	<u>Reason</u>
M. P. Board J. F. Marron	Lawrence Berkeley Laboratory	February 5	Finalize Testing Plan for Near-Surface Test Facility
V. H. Stiessberger	Spokane, Wash.	February 7	AISC Meeting
S. M. Price B. H. Richard C. W. Myers R. L. Saling R. E. Gephart J. A. Caggiano A. M. Tallman J. T. Lillie S. R. Reidel K. R. Fecht F. E. Goff P. E. Long R. A. Deju	Battelle Conference Facilities	February 13	Participate in Tectonics and Seismicity of the Columbia Plateau Workshop
		February 15	

REPORTING PERIOD

Travelers (continued)

FEBRUARY 1-28, 1978

<u>Name</u>	<u>To</u>	<u>Date</u>	<u>Reason</u>
M. P. Board	University of Minnesota	February 19	Discuss Code Development/Problem Definition Report, Near-Surface Test Facility Plan Review, and Repository Conceptual Design
M. P. Board	Colorado School of Mines	February 26	Review Test Procedures. Examine Test Equipment and Discuss Future Core Sampling

DISTRIBUTION

Number of
Copies

5	<u>Battelle-Northwest</u> T. W. Ambrose (2) J. W. Bartlett A. M. Platt (2)
1	<u>Central Washington University</u> Department of Geology
27	<u>Consultants and Subcontractors</u> J. F. T. Agapito Boeing Computer Services Richland, Inc. J. Bond Colorado School of Mines ENSCO, Inc. Fenix & Scisson, Inc. (2) Lawrence Berkeley Laboratory (2) F. L. Parker The Pennsylvania State University I. Remson W. K. Summers and Associates U. S. Bureau of Mines-Spokane U. S. Geological Survey-Water Resources U. S. Geological Survey-Western Division University of Minnesota Washington State Department of Ecology Washington State Department of Natural Resources Washington State University A. C. Waters

Number of
Copies

1	<u>Eastern Washington University</u> Department of Geology
1	<u>The Geological Society of America, Inc.</u> J. C. Frye
1	<u>Idaho Bureau of Mines and Geology</u> M. Miller
1	<u>Kansas State Geological Survey</u> W. W. Hambleton
1	<u>Lawrence Livermore Laboratories</u> L. Ramspott
1	<u>Oregon State Department of Geology and Mineralogy</u> V. C. Newton
3	<u>Sandia Laboratories</u> O. E. Jones R. W. Lynch W. D. Weart
5	<u>Union Carbide Corporation, Nuclear Division</u> <u>Office of Waste Isolation</u> A. L. Boch T. F. Lomenick W. C. McClain A. S. Quist C. D. Zerby
1	<u>United Nuclear Industries, Inc.</u> R. K. Robinson
1	<u>U. S. Army Corps of Engineers</u> Walla Walla District Geologist
1	<u>U. S. Bureau of Reclamation</u> Columbia Basin Project Geologist

Number of
Copies2 U. S. Department of Energy-Albuquerque Operations Office

D. Davis
D. T. Schueler

12 U. S. Department of Energy-Headquarters

C. R. Cooley	C. A. Heath
G. C. Cunningham	C. Klingsberg
K. P. Donovan	R. N. Ng
W. K. Eister	R. Stein
M. W. Frei	D. L. Vieth
C. H. George	J. B. Work
J. L. Gilbert	

1 U. S. Department of Energy-Nevada Operations Office

D. G. Jackson

1 U. S. Department of Energy-Oak Ridge Operations Office

J. J. Schreiber

13 U. S. Department of Energy-Richland Operations Office

J. W. Anttonen	A. G. Lassila
T. A. Bauman	D. J. Squires (4)
J. C. Cummings	F. R. Standerfer
O. J. Elgert	M. W. Tiernan
R. B. Goranson	P. S. Van Loan
P. G. Harris	

3 U. S. Environmental Protection Agency

R. Kaufman	J. Sceva
G. L. Meyers	

3 U. S. Geological Survey

G. D. DeBucharanne	W. S. Twenhofel
P. R. Stevens	

3 U. S. Nuclear Regulatory Commission

W. P. Bishop	E. P. Regnier
J. C. Malaro	

1 University of Idaho

Department of Geology

Number of
Copies

1 University of Washington
 Department of Geology

1 Washington Public Power Supply System, Inc.
 D. D. Tillson

1 Westinghouse Advanced Energy Systems
 T. Hakl

1 Westinghouse Hanford Company
 A. G. Blasewitz

84 Rockwell Hanford Operations

H. Babad	D. E. Kelley
D. C. Bartholomew	J. E. Kinzer
M. Bellofatto	E. J. Kosiancic
R. L. Biggerstaff	A. D. Krug
J. M. Carey	W. J. Kurzeka
D. J. Cockeram	J. F. Marron
T. A. Curran	R. G. Oliver
R. A. Deju	B. H. Richard
H. B. Dietz	R. C. Roal
J. W. Donahue	J. H. Roecker
G. C. Evans	R. L. Saling (50)
R. A. Freeman	D. A. Turner
P. J. Fritch	R. T. Wilde
R. G. Gimera	D. D. Wodrich
R. D. Hammond	H. A. Zweifel
W. F. Heine	Document Services (4)