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Lawrence Livermore National Laboratory
NNWSI Project

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Leach Testing of Waste Forms--Interrelationship of ISO and MCC Type Tests; V. Oversby; Published in "Workshop on Leaching Mechanisms of Nuclear Waste Forms, May 19-21, 1982", PNL-4382, pp 97-129; also available as Lawrence Livermore National Laboratory Report UCRL-87621; May 1982.

ABSTRACT

Leach testing experiments were conducted on SYNROC-D material to examine tne parameters which affect leaching results and to measure the activation energy for leaching of elements from SYNROC-D. Measured leach rates were found to be controlled by precipitation of insoluble phases for those tests where the sample surface area to volume of leachant (SA/V) multiplied by leaching time (t) exceeded 0.3 $cm^{-1}d$ for leach tests at 90°C. In these cases the apparent activation energy for leaching was approximately 10 kcal/mole based on Na and Si data. For leach tests at 90°C with (SA/V)(t) less than 0.2 $cm^{-1}d$, the activation energy for Na and Si dissolution was 18.5 kcal/mole for sample S29 and 14.5 kcal/mole for sample LS04. These activation energies are in agreement with values reported by Tole and Lasaga (1981) for nepheline dissolution.

The effect of sample geometry was investigated by leaching a series of crushed samples of different grain size. The results support the view that geometric surface area should be used in leach rate calculations rather than gas adsorption BET surface area.

Comparison of results on S29 leaching of crushed samples and monoliths show that data from MCC-1 and ISO type leach tests may be directly compared when the data are examined at constant (SA/V)(t).

Development of Waste Packages for Tuff; Albert J. Rotnman; Proceedings of the NWTS Program Information Meeting, Las Vegas, NV, December 14-16, 1982, DOE/NWTS-30, pp 119-122; available as Lawrence Livermore National Laboratory Report UCRL-88175; September 20, 1982.

ABSTRACT

The objective of this program is to develop nuclear waste packages that meet NRC requirements for a licensed repository in NTS tuff. The program was transferred to LLNL in June 1981 after an initial period at Sandia and Los Alamos. Originally the task of this program was to integrate site data relevant to the waste package and provide input to others on site-specific needs for waste package designs and materials development. Responsibility for approving such designs was also part of the program. In addition, the program was given a mandate to do limited work on materials to develop and maintain expertise in this area.

In May 1982 DOE transferred total responsibility for design and materials development to the individual projects, to be more fully funded in FY83. Much of the work reported here, therefore, was done during the "integration" phase of our program. Because of the current philosophy for redundant engineered barriers, the goal has been to approach long-term containment of radionuclides (hundreds to 1000 years) followed by a longer term (thousands of years) of very low release rates. The approach has been to study candidate metals and select those having appropriately low corrosion rates for the containment requirement. For the low release rate period, the primary retention characteristics of the waste form (processed high level waste or spent fuel) is the primary barrier; a buffer/backfill with sorbing characteristics would be used only if necessary to meet release requirements. The rationale is that effective backfills typically act as thermal insulators (especially when dehydrated) compared to the host rock and raise temperatures of all components they surround, thus putting more stringent demands on these components.

Design of a Nuclear Waste Package for Emplacement in Tuff; W. C. O'Neal, A. J. Rothman, D. W. Gregg, J. N. Hockman, M. A. Revelli, E. W. Russell, J. R. Schornhorst; Proceedings of the ANS/ASME Waste Management '83 Meeting in Tucson, Arizona, February 27-March 3, 1983, Vol. 2, pp 3-9; also available as Lawrence Livermore National Laboratory Report UCRL-88192; February 1983.

ABSTRACT

This paper discusses the design and analytical investigations that are underway at Lawrence Livermore National Laboratory on high level nuclear waste package systems for mined geological disposal in tuff in the unsaturated zone (above the water table). Preliminary results indicate that some package concepts previously developed for the saturated zone are more cost effective when engineered for an unsaturated horizon. The horizontal borehole design is the most promising emplacement concept.

EQ3NR, A Computer Program for Geochemical Aqueous Speciation-Solubility Calculations: User's Guide and Documentation; T. Wolery; Lawrence Livermore National Laboratory Report UCRL-53414; April, 1983

ABSTRACT

EQ3NR is a geochemical aqueous speciation-solubility FORTRAN program developed for application with the EQ3/6 software package. The program models the thermodynamic state of an aqueous solution by using a modified Newton-Raphson algorithm to calculate the distribution of aqueous species such as simple ions, ion-pairs, and aqueous complexes. Input to EQ3NR primarily consists of data derived from total analytical concentrations of dissolved components and can also include pH, alkalinity, electrical balance, phase equilibrium (solubility) constraints, and a default value for either Eh, pe, or the logarithm of oxygen fugacity.

The program evaluates the degree of disequilibrium for various reactions and computes either the saturation index (SI = log Q/K) or thermodynamic affinity (A = -2.303 RT log Q/K) for minerals. Individual values of Eh, pe, equilibrium oxygen fugacity, and Ah (redox affinity, a new parameter are computed for aqueous redox couples. Differences in these values define the degree of aqueous redox disequilibrium. EQ3NR may be used alone. It must be used to initialize a reaction-path calculation by EQ6, its companion program.

EQ3NR reads a secondary data file DATA1, created from a primary data file DATA0, by the data base preprocessor, EQTL. The temperature range for the thermodynamic data in the file is 0-300°C. Addition or deletion of species or changes in associated thermodynamic data are made by changing only the file. Changes are not made to either EQ3NR or EQTL. Modification or substitution of equilibrium constant values can be selected on the EQ3NR INPUT file by the user at run time. EQ3NR and EQTL were developed for the FTN and CFT FORTRAN languages on the CDC 7600 and Cray-1 computers. Special FORTRAN conventions have been implemented for ease of portability to IBM, UNIVAC, and VAX computers.

Reaction of Bullfrog Tuff with J-13 Well Water at 90°C and 150°C; V. M. Oversby, K. G. Knauss; Lawrence Livermore National Laboratory UCRL-53442; September 15, 1983.

ABSTRACT

A series of experiments were conducted to determine the nature and extent of reaction between the Bullfrog Member of the Crater Flat tuff and natural groundwater from well J-13 at the Nevada Test Site. The experiments were conducted on crushed tuff at 90°C and 150°C and on core wafer samples at 150°C. The results shows the following: (1) Increasing the ratio of rock to water increases the rate of approach to steady-state concentrations in solution. (2) Surface outcrop samples of Bullfrog tuff contain a minor component of highly soluble material believed to be a residue from the evaporation of surface runoff water in the pores of the rock. This material can be removed by shaking the crushed rock with water at room temperature and subjecting it briefly to heat with fresh water. (3) Solution analyses for unfiltered samples that have reacted for short periods show higher concentrations of Al and Fe than do analyses for filtered samples; results for other elements are independent of filtration. This difference probably exists because of particulate matter in the solutions that dissolves when the samples are acidified prior to analysis. Agitation of samples during reaction produces sub-0.1 μ particles in the solutions. These particles dissolve when samples are acidified, resulting in abnormally high concentration values for some elements, such as Al and Fe. (4) Comparison of the results for crushed rock with those for core wafers shows that the method of sample preparation does not have a large effect on the results of rock-water interaction studies.

This paper presents the data for Al, B, Na, Li, K, Fe, Si, Ca, Mg, F, Cl, NO_3, and SO_4 concentrations in solution and for the pH of solutions. Additionally, it outlines the various experimental conditions used to determine the effects of different sample weights relative to solution volume, length of reaction time, presence and nature of highly soluble components, filtration of samples, agitation of samples during reaction, and method of sample preparation.

Initial Specifications for Nuclear Waste Package External Dimensions and Materials: D. W. Gregg, W. C. O'Neal; Lawrence Livermore National Laboratory Report UCID-19926; September 1983.

ABSTRACT

Initial specifications of external dimensions and materials for waste package conceptual designs are given for Defense High Level Waste (DHLW), Commercial High Level Waste (CHLW) and Spent Fuel (SF). The designs have been developed for use in a high-level waste repository sited in a tuff media in the unsaturated zone. Drawings for reference and alternative package conceptual designs are presented for each waste form for both vertical and horizontal emplacement configurations. Four metal alloys: 304L SS, 321 SS, 316L SS and Incoloy 825 are considered for the canister or overpack; 1020 carbon steel was selected for horizontal borehole liners, and a preliminary packing material selection is either compressed tuff or compressed tuff containing iron bearing smectite clay as a binder.

Petrologic and Geochemical Characterization of the Bullfrog Member of the Crater Flat Tuff: Outcrop Samples Used in Waste Package Experiments; K. G. Knauss; Lawrence Livermore National Laboratory Report UCRL-53470; September 1983.

ABSTRACT

In support of the Waste Package Task within the Nevada Nuclear Waste Storage Investigation (NNWSI), experiments on hydrothermal rock/water interaction, corrosion, thermomechanics, and geochemical modeling calculations are being conducted. All of these activities require characterization of the initial bulk composition, mineralogy, and individual phase geochemistry of the potential repository host rock. This report summarizes the characterization done on samples of the Bullfrog Member of the Crater Flat Tuff (Tcfb) used for Waste Package experimental programs.

Containment Barrier Metals for High-Level Waste Packages in a Tuff Repository; E. W. Russell, R. D. McCright, W. C. O'Neal; Lawrence Livermore National Laboratory Report UCRL-53449; October 12, 1983.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations (NNWSI) Waste Package project is part of the U.S. Department of Energy's Civilian Radioactive Waste Management (CRWM) Program. The NNWSI project is working towards the development of multibarriered packages for the disposal of spent fuel and high-level waste in tuff in the unsaturated zone at Yucca Mountain at the Nevada Test Site (NTS). The final engineered barrier system design may be composed of a waste form, canister, overpack, borehole liner, packing, and the near field host rock, or some combination thereof. Lawrence Livermore National Laboratory's (LLNL) role is to design, model, and test the waste package subsystem for the tuff repository.

At the present stage of development of the nuclear waste management program at LLNL, the detailed requirements for the waste package design are not yet firmly established. In spite of these uncertainties as to the detailed package requirements, we have begun the conceptual design stage. By conceptual design, we mean design based on our best assessment of present and future regulatory requirements. We anticipate that changes will occur as the detailed requirements for waste package design are finalized.

Uncertainty Analysis: An Illustration from Nuclear Waste Package Development; William G. Sutcliffe; accepted by the Nuclear and Chemical Waste Management Journal (in press); available as Lawrence Livermore National Laboratory Report UCRL-90042; October 1983.

ABSTRACT

A method of uncertainty analysis is illustrated by analyzing canister corrosion in a nuclear waste package. The application of tne method for satisfying the NRC regulation, 10CFR60, governing the disposal of nuclear waste is discussed. In this method uncertainty is represented by a probability distribution in the form of a histogram. This facilitates the separation of the probability calculations from the evaluations of the performance measure. This simplicity results in a great amount of insight, and often less calculation than a Monte Carlo approach. The method is easy to understand and applicable to a wide variety of problems.

Selection of Barrier Metals for a Waste Package in Tuff; E. W. Russell, R. D. McCright, W. C. O'Neal; Proceedings of the Materials Research Society Meeting, Vol. 26 (1984), pp 763-772, also available as Lawrence Livermore National Laboratory Report UCRL-89404, Rev. 1; October 1983.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations (NNWSI) project under the Civilian Radioactive Waste Management Program is planning a repository at Yucca Mountain at the Nevada Test Site for isolation of high-level nuclear waste. Lawrence Livermore National Laboratory is developing designs for an engineered barrier system containing several barriers such as the waste form, a canister and/or an overpack, packing, and near field host rock. In this paper we address the selection of metal containment barriers.

The Characteristics of Spent LWR Fuel Relevant to its Storage in Geologic Repositories; R. E. Woodley; prepared under subcontract for Lawrence Livermore National Laboratory; HEDL TME 83-28; October 1983.

ABSTRACT

Certain characteristics of spent LWR fuel of importance to its storage in a geologic repository are provided in the present report. Numbers and dimensions of LWR fuel assemblies in the current inventory are also given.

The integrity of the fuel rod cladding and the internal conditions of the fuel rods established during their reactor residence are of particular importance. If the cladding is defected, contact between the fuel and the repository environment will be immediately possible, but the fuel itself will provide some measure of containment for the higher actinides and the fission products of greatest concern. The higher actinides are produced primarily on the fuel pellet circumference, but because tney dissolve in the urania lattice as oxides, their further movement is restricted.

The temperature of the fuel during its irradiation determines the location of the fission gases and the more volatile fission products such as cesium. If the irradiation temperature exceeds ca. 1400°C, these fission products tend to migrate into the fuel-cladding gap, where they become available for immediate release in the event of a cladding breach.

Post Emplacement Environment of Waste Packages; K. G. Knauss, V. M. Oversby, T. J. Wolery; Proceedings of the Materials Research Society Meeting, Symposium Proc. Vol. 26 (1984), pp 301-308; also available as Lawrence Livermore National Laboratory Report UCRL-89475; November 1983.

ABSTRACT

Experiments have been conducted as part of the Nevada Nuclear Waste Storage Investigations Project to determine the changes in water chemistry due to reaction of the Topopah Spring tuff with natural groundwater at temperatures up to 150°C. The reaction extent has been investigated as a function of rock-to-water ratio, temperature, reaction time, physical state of the samples, and geographic location of the samples within the tuff unit. Results of these experiments will be used to provide information on the water chemistry to be expected if a high level waste repository were to be constructed in the Topopah Spring tuff.

Tne NNWSI Waste Form Test Program; V. M. Oversby; Proceedings of the Materials Research Society Meeting, Vol. 26 (1984), pp 319-327; also available as Lawrence Livermore National Laboratory Report UCRL-89477; November 1983.

ABSTRACT

A waste form testing program has been developed to ensure that the release rate of radionuclides from the engineered barrier system will meet NRC and EPA regulatory requirements. Waste form performance testing will be done under unsaturated, low water availability conditions which represent the expected repository conditions. Testing will also be done under conditions of total immersion of the waste form in repository-type water to cover the possibility that localized portions of the repository might contain standing water. Testing of reprocessed waste forms for CHLW and DHLW will use reaction vessels fabricated from Topopah Spring tuff. Chemical elements which are expected to show the highest release rates in the mildly oxidizing environment of the Topopah Spring tuff horizon at Yucca Mountain are Np and Tc. To determine the effect of residual canister material and of corrosion products from the canister/overpack, waste form testing will be done in the presence of these materials. The release rate of all radionuclides which are subject to NRC and EPA regulations will be measured, and the interactive effects of the released radionuclides and the rock reaction vessels will be determined. Tne testing program for spent fuel will determine the release rate from bare spent fuel pellets and from Zircaloy clad spent fuel where the cladding contains minor defects. A metal testing program for Zircaloy will establish the expected lifetime of the cladding material. Estimation of the state of cladding for fuel presently in reactor pool storage will provide baseline data for Zircaloy containment credit.

Permeability and Pore-Fluid Chemistry of the Topopah Spring Member of the Paintbrush Tuff, Nevada Test Site, in a Temperature Gradient: Application to Nuclear Waste Storage; C. A. Morrow, D. E. Moore, and J. D. Byerlee, Proceedings of the Materials Research Society Symposium, Boston, MA, Vol. 26 (1984), pp. 883-890; November 1983.

ABSTRACT

The Topopah Spring Member of the Paintbrush Tuff from the Nevada Test Site is being investigated by the Nevada Nuclear Waste Storage Investigations project (NNWSI) as a possible nuclear waste repository host rock. Changes with time of the permeability and fluid chemistry of the Topopah Spring Member have been measured in samples subjected to a temperature gradient. Maximum temperatures of the imposed gradients ranged from 90°C to 250°C; minimum temperatures were 36°C to 83°C. Confining and pore pressures simulated a depth of about 1.2 km, which is greater than the proposed repository depth, but chosen for comparison with previous studies at these pressures. Pore fluid used in the experiments was groundwater from the Nevada Test Site; the direction of pore-fluid flow was from the high- to the low-temperature side of the tuffs.

Initial permeabilities of the tuff samples ranged from 8 to 65 darcys, the wide range in values resulting from differences in the void and fracture geometries of the samples. Heating the tuffs produced no change in permeability in the lowest temperature experiment and only small changes at higher temperatures. The fluids discharged from the tuffs were dilute waters of near-neutral pH that differed only slightly from the original groundwater composition.

Since proposed burial in the Topopah Spring Member would be in the unsaturated zone, the high initial permeabilities and the absence of permeability change with heating may be desirable, because downward-percolating waters would be be able to drain into deeper formations and not collect at the repository level. In addition, any fluids that may come in contact with waste canisters will not have acquired any potentially corrosive characteristics through interaction with the tuff.

Corrosion Test Plan to Guide Canister Material Selection and Design for a Tuff Repository; R. D. McCright, R. A. Van Konynenburg, L. B. Ballou; Proceedings of the Materials Research Society Meeting, Vol. 26 (1984), pp 309-318; also available as Lawrence Livermore National Laboratory Report UCRL-89476; November 1983.

ABSTRACT

Corrosion rates and the mode of corrosion attack form a most important basis for selection of canister materials and design of a nuclear waste package. Type 304L stainless steel was selected as the reference material for canister fabrication because of its generally excellent corrosion resistance in water, steam and air. However, 304L may be susceptible to localized and stress-assisted forms of corrosion under certain conditions. Alternative alloys are also investigated; these alloys were chosen because of their improved resistance to tnese forms of corrosion. The fabrication and welding processes, as well as the glass pouring operation for defense and commercial high-level wastes, may influence the susceptibility of the canister to localized and stress forms of corrosion.

Selection of Candidate Canister Materials for High-Level Nuclear Waste Containment in a Tuff Repository; R. D. McCright, H. Weiss, M. C. Juhas, R. W. Logan; Corrosion/84 Conference, National Association of Corrosion Engineers, Houston, TX, April 1984, paper #198; also available as Lawrence Livermore National Laboratory Report UCRL-89988; November 1983.

ABSTRACT

A repository located at Yucca Mountain at the Nevada Test Site is a potential site for permanent geological disposal of high level nuclear waste. The repository can be located in a horizon in welded tuff, a volcanic rock, which is above the static water level at this site. The environmental conditions in this unsaturated zone are expected to be air and water vapor dominated for much of the containment period. Type 304L stainless steel is the reference material for fabricating canisters to contain the solid high-level wastes. Alternative stainless alloys are considered because of possible susceptibility of 304L to localized and stress forms of corrosion. For the reprocessed glass wastes, the canisters serve as the recipient for pouring the glass with the result that a sensitized microstructure may develop because of the times at elevated temperatures. Corrosion testing of the reference and alternative materials has begun in tuff-conditioned water and steam environments.

Performance Testing of Waste Forms in a Tuff Environment; V. M. Oversby; Proceedings of the Civilian Radioactive Waste Management Information Meeting, Washington, DC, December 12-15, 1983, CONF. 831217, pp 270-279; also available as Lawrence Livermore National Laboratory Report UCRL-90045; November 1983.

ABSTRACT

As part of the NNWSI Project, Lawrence Livermore National Laboratory is responsible for the design of the waste package and for determining the expected performance of the waste package in the repository environment. The reference horizon for a potential repository at Yucca Mountain is the densely welded, devitrified portion of the Topopah Spring Member of the Paintbrush Tuff. In order to determine the expected performance of waste package components in the post emplacement repository environment we must first develop an understanding of what that environment will be. Geologic, hydrologic and geochemical investigations under way at Yucca Mountain will provide the baseline information for determining the present conditions at the repository horizon. Construction of a repository and emplacement of waste packages would change those conditions.

This paper describes experimental work conducted at LLNL to establish the chemical composition of water which will have reacted with Topopah Spring Member tuff prior to contact with waste packages. The experimental program to determine the behavior of spent fuel and borosilicate glass in the presence of this water is also described. Preliminary results of experiments using spent fuel segments with defects in the Zircaloy cladding are presented. Some results from parametric testing of a borosilicate glass with tuff and 304L stainless steel are also discussed.

Waste Package for a Repository Located in Tuff; Lynden B. Ballou; Proceedings of the Civilian Radioactive Waste Management Information Meeting, Washington, DC, December 12-15, 1953, CONF. 831217, pp 265-269; also available as Lawrence Livermore National Laboratory Report UC2L-90044; November 1983.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations (NNWSI) project is evaluating a potential repository system to be located on or adjacent to the Department of Energy Test Site in Nye County, Nevada. The particular site which is being investigated is a thick sequence of volcanic tuff beds which form Yucca Mountain on the southwestern portion of the Test Site and adjoining Federal land. A distinguishing feature of this site is a very deep water table which permits consideration of a densely welded devitrified tuff horizon, the Topopah Spring member, which is located above the water table. Among the advantages of siting a repository in the unsaturated zone are very limited availability of water due to the low influx rate in this arid region; low temperatures at which liquid water can be present; and absence of significant hydrostatic stress on the waste packages.

Within the NNWSI project, the Lawrence Livermore National Laboratory (LLNL) is assigned responsibility for the development and qualification of designs for waste packages suitable for emplacement in a high level waste repository at Yucca Mountain. The topics which must be addressed to establish the viability of waste package designs can be logically structured within four broad categories, recognizing that each interacts with the others. These include the package environment, the materials to be utilized, the package design, and analysis and test of its performance. These areas provide the basis for the organization of the LLNL waste package effort, and this discussion will address each of them. The major accomplishments during FY 83 and the planned activities for FY 84 will be described.

Test Plan for Spent Fuel Cladding Containment Credit Tests; C. N. Wilson; prepared under subcontract for Lawrence Livermore National Laboratory; HEDL TC-2353-2, November 1983.

ABSTRACT

The US Department of Energy (DOE), through the National Waste Terminal Storage (NWTS) Program, is actively studying the technical feasibility of permanent disposal of high-level nuclear waste in geological formations. A schedule for siting, licensing and construction of a geologic repository is established by the Nuclear Waste Policy Act of 1982, which was signed into law by the President on January 7, 1983. Principle geologic formations under consideration include tuff, salt and basalt. Tuff is the primary rock type underlying the Nevada Test Site. Lawrence Livermore National Laboratory (LLNL) is the lead contractor for developing waste packages for the proposed Nevada Test Site repository. Two types of high-level waste (HLW) forms that are candidates for repository disposal are spent fuel rods and/or solidified waste from spent fuel reprocessing.

LLNL has chosen Westinghouse Hanford Company (WHC) as a subcontractor to assist them in determining the requirements for successful disposal of spent fuel rods in the proposed Nevada Test Site repository. An initial scoping test, with the objective of determining whether or not the cladding of a breached fuel rod can be given any credit as an effective barrier to radionuclide release, is described in this test plan.

Nuclear Criticality Safety Analysis of a Spent Fuel Waste Package in a Tuff Repository; B. H. Weren, M. A. Capo, W. C. O'Neal; submitted to Lawrence Livermore National Laboratory by Westinghouse Electric Corporation, Waste Technology Services Division, Pittsburgh, PA; Lawrence Livermore National Laboratory Contractor Report UCRL-1575; December 1953.

ABSTRACT

An assessment has been performed of the criticality potential associated with the disposal of spent fuel in a tuff geology above the water table. Eleven potential configurations were defined which cover a vast range of geometries and conditions from the nominal configuration at emplacement to a hypothetical configuration thousands of years after emplacement in which the structure is gone, the fuel pellets disintegrated and the borehole flooded. Of these eleven configurations, four have been evaluated at this time.

The results of this evaluation indicate that even with very conservative assumptions (4.5 w/o fresh fuel), criticality is not a problem for the nominal configuration either dry or fully flooded. In the cases where the condition of the waste package is assumed to have severely deteriorated, over long times, calculations were performed with less conservative assumptions (depleted fuel). An assessment of these calculations indicates that criticality safety could be demonstrated if the depletion of the fissile inventory during fuel irradiation is taken into account.

A detailed discussion of the calculations performed is presented in this report. Also included are a description of the configurations which were considered, the analytical methods and models used, and a discussion of additional related work which should be performed.

An Overview of Low Temperature Sensitization; M. J. Fox, and R. D. McCright; Lawrence Livermore National Laboratory Contractor Report UCRL-15619; December 1983.

ABSTRACT

The waste package effort at LLNL is developing multibarriered packages for safe, permanent disposal in a repository such as the one being considered at Yucca Mountain. The physical, mechanical, and chemical stability of a metal barrier to survive the 300-1000 year containment objective is the paramount technical issue in selecting a suitable container material for geological disposal of high-level nuclear waste. Austenitic stainless steels serve as the reference container materials in the conceptual design for nuclear waste packages for a contemplated geological repository in tuff located in Yucca Mountain. The corrosion resistance of candidate container materials in the anticipated repository environment is the focus of an experimental program to establish a data base on which the final material selection will be made and from which models to project the long-range corrosion performance will be developed.

This report is a comprehensive literature review on Low Temperature Sensitization (LTS). The purpose of the review was to determine if LTS-related metallurgical changes can occur in commercial Type 304L stainless steel within the times and temperatures associated with nuclear waste storage. Any such changes could affect the long-term corrosion resistance of the currently designed waste storage canisters.

Permeability and Pore-Fluid Chemistry of the Bullfrog Tuff in a Temperature Gradient: Summary of Results; J. Byerlee, C. Morrow and D. Moore; U.S. Geological Survey Open-File Report 83-475; 1983.

ABSTRACT

The permeability and fluid chemistry of a Nevada Test Site tuff is being studied under conditions simulating a nuclear waste repository environment. The purpose of this project is to investigate the changes that take place with time when groundwater comes in contact with heated rock, and to determine the ease with which potential radionuclide-bearing groundwater could be carried into the environment.

Samples of the Bullfrog Member of the Crater Flat Tuff were collected from the southwest end of Yucca Mountain, just outside the boundaries of the Nevada Test Site. The Bullfrog at this location has four distinct layers. Going up-section they are: an air fall, a vitrophyre, a vapor-phase altered ash flow, and an unwelded ash flow. Our samples were collected exclusively from the vapor-phase altered ash flow. They are devitrified, non-zeolitized and moderately welded. Deformed elongated pumice fragments are visible in the matrix, as well as large elongated voids.

Permeability and Pore-Fluid Chemistry of the Bullfrog Tuff in a Temperature Gradient; C. Morrow, D. Moore, and J. Byerlee; Proceedings to the 24th Symposium on Rock Mechanics, pp 819-828; 1983.

ABSTRACT

The permeability and fluid chemistry of the Bullfrog Tuff from the Nevada Test Site was studied under simulated nuclear waste repository conditions to determine the ease with which radionuclides could be carried in the environment. In our experimental system, pore fluids flowed radially through a cylindrical sample of the tuff from a high temperature outer edge of the rock, which ranged between 48° and 73°C. Confining and pore pressures simulated a depth of burial of approximately 1.2 km.

Permeabilities of the initial room temperature rock ranged from .4 to .85 microdarcies. Upon heating, these values increased several microdarcies due to thermal cracking. Exposure to the hot fluids, over time, reduced the permeability of the 250°C cylinders by 25-50% of the initial heated values, regardless of the chemistry of the pore fluids. The cylinder at 150°C showed no systematic change in permeability with time.

Chemical analysis of the discharged pore fluids indicate that the growth of minerals such as zeolites or smectite clays within cracks and pores of the tuff may have led to the observed permeability reductions. These reductions are less than those occurring in similar, previous studies of granites and quartzite, which showed permeability decreases of up to two orders of magnitude. The granite and quartzite samples had lower initial permeabilities, lower porosities and fluid flow predominantly through thin grain boundary cracks which gave rise to rapid crack clogging.

Although the Bullfrog Tuff does not show the dramatic permeability changes typical of other rock types, this study demonstrates that fluid flow can be slowed by up to 50% within a few weeks of exposure to higner temperatures.

Nuclear Waste Package Design for the Vadose Zone in Tuff; W. C. O'Neal, L. B. Ballou, D. W. Gregg and E. W. Russell; Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ, March 11-15, 1984, Vol. 1, pp 547-551; also available as Lawrence Livermore National Laboratory Report UCRL-89830; February 1984.

ABSTRACT

This report presents an overview of the selection and analysis of conceptual waste package designs that will be used by the Nevada Nuclear Waste Storage Investigations (NNWSI) project for disposal of high level nuclear waste (HLW) at the proposed Yucca Mountain, Nevada site.

The design requirements that the waste packages are required to meet are listed. Concept drawings for the reference designs and one alternative package design are shown. Four metal alloys; 304L SS, 321 SS, 316L SS and Incoloy 825 have been selected for candidate canister/overpack materials, and 1020 carbon steel has been selected as the reference metal for the borehole liners.

A summary of the results of technical and economic analysis supporting the selection of the conceptual waste package designs is included. Post-closure containment and release rates are not discussed in this paper.

Thermal Modeling of Nuclear Waste Package Designs for Disposal in Tuff; J. N. Hockman, W. C. O'Neal; Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ, March 11-15, 1984, Vol. 1, pp 441-448; also available as Lawrence Livermore National Laboratory Report UCRL-89820, Rev. 1; February 1984.

ABSTRACT

Lawrence Livermore National Laboratory is involved in the design and testing of high level nuclear waste packages. Many of the aspects of waste package design and testing (e.g., corrosion and leaching) depend in part on the temperature history of the emplaced packages. This paper discusses thermal modeling and analysis of various emplaced waste package conceptual designs including the models used, the assumptions and approximations made, and the results obtained.

Spent Fuel Cladding Containment Credit Tests; C. N. Wilson, V. M. Oversby; Proceedings of the ANS/ASME Waste Management 84 Meeting, Tucson, AZ, March 11-15, 1984, Vol. 1, pp 569-572; Lawrence Livermore National Laboratory Report UCRL-89869; February 1984.

ABSTRACT

Preliminary tests are being conducted to evaluate the effectiveness of defected cladding as a barrier to radionuclide release from spent fuel rods stored in a geological repository. The tests are being conducted at the Hanford Engineering Development Laboratory for the Lawrence Livermore National Laboratory Waste Package Task of the Nevada Nuclear Waste Storage Investigations (NNWSI) tuff repository project. In these tests, spent PWR fuel rod specimens with various artificially induced cladding defects are leach tested in a test matrix which also includes both bare fuel specimens (unclad) and undefected spent fuel rod specimens. Artificial cladding defects are made by laser drilling and sawing to give defect areas in the 10^4 to 10^6 μm^2 range. Periodic samples are taken of the leach solution and fused quartz rods contained in the test vessels. Results for the first 180 days of testing are presented.

Hydrothermal Interaction Studies of Bullfrog Member Tuff Core Wafers in J-13 Water at 150°C Quantitative Analyses of Aqueous and Solid Pnases; K. Knauss; Lawrence Livermore National Laboratory Report UCRL-53521, February, 1984.

ABSTRACT

This paper describes the experimental work conducted to understand the water chemistry in the near-field surrounding a nuclear waste repository in the Bullfrog Member of the Crater Flat Tuff, Nev., and to study any changes in the rock itself due to hydrothermal alteration. The work is part of the Nevada Nuclear Waste Storage Investigations (NNWSI) Project to determine the suitability of the volcanic units at Yucca Mountain for storing nigh-level nuclear waste.

Static hydrothermal experiments with polished core wafers were run for 60 d; all faces of the core wafers were exposed to solution. Quantitative solution analyses indicate that the solution chemistry for both crushed tuff and solid core wafers is in good agreement. Analyses of the solid phases suggest that the extent of reaction, at least over the 60-d period, is relatively minor, even though solution effects were observed. These experiments show that conditions in a repository located in tne Bullfrog Member would be relatively benign with respect to waste form and waste package survival.

Reference Waste Forms and Packing Material for the Nevada Nuclear Waste Storage Investigations Project; V. M. Oversby; Lawrence Livermore National Laboratory Report UCRL-53531; April 1984.

ABSTRACT

The Lawrence Livermore National Laboratory (LLNL), Livermore, Calif., has been given the task of designing and verifying the performance of waste packages for the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. NNWSI is studying tne suitability of the tuffaceous rocks at Yucca Mountain, Nevada Test Site, for the potential construction of a high-level nuclear waste repository. This report gives a summary description of the three waste forms for which LLNL is designing waste packages: spent fuel, either as intact assemblies or as consolidated fuel pins, reprocessed commercial high-level waste in the form of borosilicate glass, and reprocessed defense high-level waste from the Defense Waste Processing Facility in Aiken, S.C. Reference packing material for use with the alternative waste package design for spent fuel is also described.

EQ3/6 Geochemical Modeling Task Plan for Nevada Nuclear Waste Storage Investigations (NNWSI); D. Isherwood and T. Wolery; Lawrence Livermore National Laboratory Report UCID-20069, April 1984.

ABSTRACT

This task plan outlines work needed to upgrade the EQ3/6 geochemical code and expand the supporting data bases to allow the Nevada Nuclear Waste Storage Investigations (NNWSI) to model chemical processes important to the storage of nuclear waste in a tuff repository in the unsaturated zone. The plan covers the fiscal years 1984 to 1988. The scope of work includes the development of sub-models in the EQ3/6 code package for studying the effects of sorption, precipitation kinetics, redox disequilibrium, and radiolysis on radionuclide speciation and solubility. The work also includes a glass/water interactions model and a geochemical flow model which will allow us to study waste form leaching and reactions involving the waste package. A special emphasis is placed on verification of new capabilities as they are developed and code documentation to meet NRC requirements. Data base expansion includes the addition of elements and associated aqueous species and solid phases that are specific to nuclear waste (e.g., actinides and fission products) and the upgrading and documentation of the thermodynamic data for other species of interest.

Thermal Analysis of NNWSI Conceptual Waste Package Designs; W. Stein, J. Hockman, W. O'Neal, UCID-20091, April 1984.

ABSTRACT

Lawrence Livermore National Laboratory is involved in the design and testing of high level nuclear waste packages. Many of the aspects of waste package design and testing (e.g., corrosion and leaching) depend in part on the temperature history of the emplaced packages. This report discusses thermal modeling and analysis of various emplaced waste package conceptual designs including the models used, the assumptions and approximations made, and the results obtained.

The Behavior of an Actinide Glass in Radiolysis Experiments in a Saturated Tuff Environment; J. Bates, V. Oversby; presented at the Material Research Society Meeting, Boston, MA, November 1984; Lawrence Livermore National Laboratory Report UCRL-90818; May 1984.

ABSTRACT

Experiments have been completed which measure the behavior of waste package components in a gamma radiation field under "worst case" conditions applicable to a repository located in the unsaturated zone in tuff. The experiments were conducted as part of the Waste Package Task of the Nevada Nuclear Waste Storage Investigation Project.

These conditions were chosen to augment the results from the rock cup, Phase One, tests which simulate transient standing water that might exist in the unsaturated zone, and include several different test configurations to interpret the physical processes that occur.

These tests are done using both SRL 165 and PNL 76-68 actinide-containing glasses

1. Glass disks, 304L SS holders, and aged J-13 well water with SA/V of 0.3 cm^{-1}.
2. Glass disks. 304L SS holders, tuff rock, and aged J-13 well water with a SA/V of 0.3 cm^{-1}, and
3. Crushed glass and aged J-13 well water with a SA/V of 1 cm^{-1}.

At tne conclusion of each test, solutions were analyzed for pH, cations, anions, and radionuclides. The test components were analyzed for type and degree of reaction using SEM, EDS, and SIMS. The results of these tests are discussed and compared to similar tests done without the radiation field.

Overview of Geochemical Modeling Needs for Nuclear Waste Management; D. Isherwood and T. Wolery, presented at Workshop on Fundamental Geochemistry Needs for Nuclear Waste Isolation at Los Alamos National Laboratory, June 1984; Lawrence Livermore National Laboratory Report UCRL-90846, May, 1984.

ABSTRACT

There is a well established need for a comprehensive geochemical code capable of modeling chemical processes important to the study of nuclear waste disposal (e.g., Apps et al., 1982). Both the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) will rely on computer generated predictions of radionuclide migration to evaluate potential repository sites. This heavy reliance on computer models is the only technically feasible approach given the limited time scale of field and laboratory experiments. For both long-term predictions involving tens of thousands of years and the interpretation of short-term experiments, the geochemical codes used to support a licensing application must be capable of modeling the thermodynamics and kinetics of reactions that control processes such as sorption and precipitation.

This paper identifies fundamental research needs for nuclear waste isolation, by looking at the areas of geochemical code and data base development already planned by the tuff (Nevada Nuclear Waste Storage Investigations, NNWSI) and salt (Office of Nuclear Waste Isolation, ONWI) Programs. The information provides us with a basis for recommending basic research areas which will complement the modeling work now underway or planned.

Hydrothermal Interaction of Topopah Spring Tuff with J-13 Water as a Function of Temperature; K. Knauss, J. Delany, J. Beiriger, D. Peifer; presented at the Materials Research Society Meeting, Boston, MA, November 1984; Lawrence Livermore National Laboratory Report UCRL-90853, May 1984.

ABSTRACT

In support of the Nevada Nuclear Waste Storage Investigations Project experiments were conducted to study the hydrothermal interaction of rock and water representative of a potential repository in tuff. These experiments provided data relevant to near-field repository conditions that can be used to: assess the ability to use "accelerated" tests based on the SA/V (surface area/volume) parameter and temperature; allow the measurement of chemical changes in phases present in the tuff before reaction as well as the identification and chemical analysis of secondary phases resulting from hydrothermal reactions; and demonstrate the usefulness of geochemical modeling in a repository environment using the EQ3/6 thermodynamic/kinetic geochemical modeling code. Crushed tuff and polished wafers of tuff were reacted with a natural ground water in Dickson-type gold-cell rocking autoclaves which were periodically sampled under in situ conditions. Results were compared with predictions based on the EQ3/6 geochemical modeling code. Eight short-term experiments (2 to 3 months) at 150°C and 250°C have been completed using tuff from both drillcore and outcrop. Long-term experiments at 90°C and 150°C using drillcore polished wafers are in progress. This paper will focus on tne results of the 150°C and 250°C experiments using drillcore polished wafers.

Reaction of the Topopah Spring Tuff with J-13 Well Water at 90°C and 150°C: V. Oversby, Lawrence Livermore National Laboratory Report UCRL-53552, May 1984.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations (NNWSI) Project is examining the suitability of the Topopah Spring Member of the Paintbrush Tuff for potential development as a high level nuclear waste repository. As part of the NNWSI Project, the Lawrence Livermore National Laboratory is responsible for the design and testing of waste packages suitable for use in the Topopah Spring tuff at Yucca Mountain. Definition of the physical and chemical environment of the waste package is part of tnat task. Tnis report describes a series of hydrothermal experiments using crushed tuff from the Topopah Spring Member and natural groundwater from well J-13. The purpose of these experiments is to define the changes in water chemistry that would result from temperature changes caused by emplacement of high level nuclear waste in a repository in the Topopan Spring tuff.

Experiments were conducted at 90 and at 150°C in Teflon-lined reaction vessels. Results are given for four rock to water ratios at 90°C and for reaction times up to 72 days. Data for 150°C cover reaction times up to 64 days and four rock to water ratios. The composition of evaporite deposits contained in the pores of surface outcrop rock material used in these experiments is determined and for two of the data sets rock material was pretreated to remove this "caliche"-type material.

The main conclusion that can be drawn from this work is that changes in the water chemistry due to heating of the rock-water system can be expected to be very minor. There is no significant source of anions (F^-, Cl^-, NO_3^-, or $SO_4^=$) in the rock; solution anion compositions after reaction of pretreated rock with J-13 water differ very little from the starting compositions. The major changes in cations are an increase in silica to approximately the level of cristobalite solubility, supersaturation of aluminum followed by slow precipitation, and fairly rapid precipitation of Ca and Mg due to the retrograde solubility of calcite.

Petrologic & Geochemical Characterization of the Topopah Spring Member of the Paintbrush Tuff: Outcrop Samples Used in Waste Package Experiments; K. Knauss; Lawrence Livermore National Laboratory Report UCRL-53558; June 1984.

ABSTRACT

This report summarizes characterization studies conducted with outcrop samples of Topopah Spring Member of the Paintbrush Tuff (Tpt). In support of the Waste Package Task within the Nevada Nuclear Waste Storage Investigation (NNWSI), Tpt is being studied both as a primary object and as a constituent used to condition water that will be reacted with waste form, canister, or packing material. These studies directly or indirectly support NNWSI subtasks concerned with waste package design and geochemical modeling. To interpret the results of subtask experiments, it is necessary to know the exact nature of the starting material in terms of the initial bulk composition, mineralogy, and individual phase geochemistry.

Electrochemical Determination of the Corrosion Behavior of Candidate Alloys Proposed for Containment of High Level Nuclear Waste in Tuff; D. McCright; Lawrence Livermore National Laboratory Report UCID-20174; June 1984.

ABSTRACT

Long-term geological disposal of nuclear waste requires corrosion-resistant canister materials for encapsulation. Several austenitic stainless steels are under consideration for such purposes for the disposal of high-level waste at the candidate repository site located at Yucca Mountain, Nevada. With regard to corrosion considerations, a worst case scenario at this prospective repository location would result from the intrusion of vadose water. This preliminary study focuses on the electrochemical and corrosion behavior of the candidate canister materials under worst-case repository environments. Electrochemical parameters related to localized attack (e.g., pitting potentials) and the electrochemical corrosion rates have been examined.

Changes in Permeability and Fluid Chemistry of the Topopah Spring Member of the Paintbrush Tuff (NTS) When Held in a Temperature Gradient: Summary of Results; D. E. Moore, C. A. Morrow, J. D. Byerlee; submitted by USGS (USGS O.F. 84-273), Lawrence Livermore National Laboratory Contractor Report UCRL-15620; June 1984.

ABSTRACT

A series of permeability experiments has been conducted to model the flow of groundwater away from canisters heated by radioactive decay at a nuclear waste disposal site in tuffaceous rock. The purpose of the study was to determine the effects of localized heating around the canisters on the repository rock and associated groundwaters. This work was performed as a support study for the Nevada Nuclear Waste Storage Investigations (NNWSI) project under a contract to Lawrence Livermore National Laboratory which is conducting waste packaging studies. Studies concentrated on two tuff units from the Nevada Test Site which are being evaluated as possible disposal horizons: the Bullfrog Member of the Crater Flat Tuff, and the Topopah Spring Member of the Paintbrush Tuff. Results for the Bullfrog Member have been presented in Morrow et al. (1983) and Byerlee et al. (1983). This paper reports the permeability and groundwater chemistry results for the Topopah Spring Member and compares those results with the previous work on Bullfrog.

Parametric Testing of a DWPF Borosilicate Glass; F. Bazan and J. Rego; Proceedings of the Materials Research Society Meeting, Boston, MA, November 1984 (in press); available as Lawrence Livermore National Laboratory Report UCRL-90857, July 1984.

ABSTRACT

The parametric testing of a DWPF borosilicate glass has been completed as part of the Waste Package task of the NNWSI Project. Static leaching tests were performed at 90°C using deionized (DI) water and J-13 water (tuffaceous formation groundwater).

Four sets of experiments were conducted:

a) DWPF glass with DI water
b) DWPF glass with J-13 water
c) DWPF glass with J-13 water and crushed tuff
d) DWPF glass with J-13 water, crushed tuff, and 304 L stainless steel

Blank samples were run simultaneously to establish background levels due to the presence of crushed tuff and stainless steel in the case of the J-13 leachant. Effects on release rates of glass components due to variations in the ratio of surface area of the glass sample to the volume of leachant used will be discussed. Leach rates will be shown for samples leached from 1 to 180 days. The results in this paper will show that when the DWPF glass is leached with J-13 water either alone or in the presence of crushed tuff or crushed tuff and stainless steel, the leacn rates are about one order of magnitude lower compared to the leach rates obtained in deionized water. There appears to be little or no difference in leach rates for samples in J-13 water alone or in the presence of crushed tuff.

Leaching Savannah River Plant Nuclear Waste Glass in a Saturated Tuff Environment; N. Bibler, G. Wicks, V. Oversby; presented at the Materials Research Society Meeting, Boston, MA, November 1984; Lawrence Livermore National Laboratory Report UCRL-91258; July 1984.

ABSTRACT

Samples of SRP glass containing either simulated or actual radioactive waste were leached at 90°C in a simulated tuff repository environment under saturated conditions. The leach vessels were fabricated of tuff and actual tuff groundwater was used. Thus, the glass was leached only in the presence of those materials (including selected package materials that would be in the repository) that will be in the actual repository. Tests were performed for up to 6 months at SA/V ratio of 1.0 cm^{-1}. Results with glass containing simulated waste indicated that stainless steel canister material around the glass did not significantly affect the leaching. Also tuff buffered the pH so that only a slight increase was observed as a result of leaching. Results with glass containing actual radioactive waste indicated that tuff lowered the concentrations of Cs-137, Sr-90, and Pu-238 in the free groundwater in the simulated repository by 10-100X. Also, radiolysis of the groundwater by the glass (approximately 1000 rad/hr) did not cause a significant pH change. Measured normalized mass losses for the glass based on Cs-137, Sr-90, and Pu-238 in the free groundwater were low, nominally 0.03, 0.1, and 0.005 g/m^2, respectively, indicating that the glass-rock system retained radionuclides well.

Reaction of the Topopah Spring Tuff with J-13 Water at 120°C; V. Oversby, Lawrence Livermore National Laboratory Report UCRL-53574; July 1984.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations (NNWSI) Project is examining the suitability of the Topopah Spring Member of the Paintbrush Tuff for potential development as a high level nuclear waste repository. As part of the NNWSI Project, the Lawrence Livermore National Laboratory (LLNL) is responsible for the design and testing of waste packages suitable for use in the Topopah Spring tuff at Yucca Mountain. Definition of the physical and chemical environment of the waste package is part of that task. This report describes a series of hydrothermal experiments using crushed tuff from the Topopah Spring Member and natural ground water from well J-13. The purpose of these experiments is to define the changes in water chemistry that would result from temperature changes caused by emplacing high level nuclear waste in a repository in the Topopah Spring tuff.

Experiments were conducted at 120°C in Teflon-lined reaction vessels at four separate rock-to-water ratios and for reaction times up to 72 days. The composition of evaporite deposits contained in the pores of the surface-outcrop rock material used in these experiments is determined from solution compositions resulting from treatment of the rock before the start of the experiments. Results for the experiments at 120°C are compared with previous experimental results from hydrothermal reaction of the Topopah Spring tuff with J-13 water at 90 and 150°C.

The main conclusion that can be drawn from this work is that changes in the water chemistry due to heating of the rock-water system can be expected to be very minor. There is no significant source of anions (F^-, Cl^-, NO_3^-, or SO_4) in the rock; solution anion compositions after reaction of pretreated rock with J-13 water differ very little from the starting compositions. The major changes in cations are an increase in silica to approximately the level of cristobalite solubility, supersaturation of aluminum followed by slow precipitation, and fairly rapid precipitation of calcium and magnesium due to the retrograde solubility of calcite. These results are in good agreement with those previously reported for reaction of the tuff with J-13 water at 90 and 150°C.

Laboratory Experiments Designed to Provide Limits on the Radionuclide Source Term for the NNWSI Project; V. Oversby, and R. D. McCright; presented at the OECD Nuclear Energy Agency, U.S. DOE Workshop on the Source Term for Radionuclide Migration from High-Level Waste or Spent Nuclear Fuel Under Realistic Repository Conditions, Alb, NM, November 13-15, 1984; Lawrence Livermore National Laboratory Report UCRL-91257; July 1984.

ABSTRACT

The major waste form to be disposed of in the first high level radioactive waste repository in the United States will be spent fuel from commercial power reactors. As part of our activities in support of the Nevada Nuclear Waste Storage Investigations (NNWSI) Project we have designed experiments to measure the release rate of radionuclides from Zircaloy-clad spent fuel for the case where the cladding contains defects that allow fluid access to the fuel. We have also included fuel segments with intact cladding and bare fuel material in the experimental matrix. Experiments in deionized water for time periods exceeding 200 days have been completed; a companion set of experiments in site specific water are in progress. Results of these two sets of experiments will be discussed and plans for future work will be described. The relationship of these experiments to the derivation of a radionuclide source term for a repository sited in unsaturated tuff will be discussed.

Effects of Tuff Waste Package Components on Release From 76-68 Simulated Waste Glass; G. L. McVay, G. R. Robinson; submitted by Pacific Northwest Laboratory under subcontract to Lawrence Livermore National Laboratory; PNL-4897; August 1984.

ABSTRACT

An experimental matrix has been conducted that will allow evaluation of the effects of waste package constituents on the waste form release behavior in a tuff repository environment. Tuff rock and groundwater were used along with 304L, 316, and 1020M ferrous metals to evaluate release from uranium-doped MCC 76-68 simulated waste glass. One of the major findings was that in the absence of 1020M mild steel, tuff rock powder dominates the system. However, when 1020M mild steel is present, it appears to dominate the system. The rock-dominated system results in suppressed glass-water reaction and leaching while the 1020M-dominated system results in enhanced leaching--but the metal effectively scavenges uranium from solution. The 300-series stainless steels play no significant role in affecting glass leaching characteristics.

Report on Static Hydrothermal Alteration Studies of Topopah Spring Tuff Core Wafers in J-13 Water at 150°C; K. Knauss, J. Beiriger; Lawrence Livermore National Laboratory Report UCRL-53576; August 1984.

ABSTRACT

This report presents the results of preliminary experimental work done to define the package environment in a potential nuclear waste repository in the Topopah Spring Member of the Paintbrush Tuff. The work is supported by the Nevada Nuclear Waste Storage Investigations (NNWSI) Project as a part of the Waste Package task to design a package suitable for waste storage within volcanic units at the Nevada Test Site.

Static hydrothermal alteration experiments were run for 4 months using polished wafers either fully submerged in an appropriate natural ground water or exposed to water-saturated air with enough excess water to allow refluxing. The aqueous results agreed favorably with similar experiments run using crushed tuff, and the use of solid polished wafers allowed us to directly evaluate the effects of reaction on the tuff. The results are preliminary in the sense that these experiments were run in Dickson-type gold-cell rocking autoclaves. The results predict relatively minor changes in water chemistry, very minor alteration of the nost rock, and the production of slight amounts of secondary minerals. when liquid water could return to the rock pores following the temperature maximum during the thermal period.

Pre-closure Analysis of Conceptual Waste Package Designs for a Nuclear Waste Repository in Tuff; W. O'Neal, L. Ballou, D. Gregg, J. Hockman, W. Stein, E. Russell; Lawrence Livermore National Laboratory Report UCRL-53595, August 1984.

ABSTRACT

This report discusses the selection and analysis of conceptual waste package designs developed by the Nevada Nuclear Waste Storage Investigations (NNWSI) project for possible disposal of high level nuclear waste at a candidate site at Yucca Mountain, Nevada. The design requirements that the waste packages must conform to are listed, as are several desirable design considerations. Illustrations of the reference and alternative designs are shown. Four austenitic stainless steels (316L SS, 321 SS, 304L SS and Incoloy 825 high nickel alloy) have been selected for candidate canister/overpack materials, and 1020 carbon steel has been selected as the reference metal for the borehole liners. A summary of the results of technical and economic analyses supporting the selection of the conceptual waste package designs is included. Post-closure containment and release rates are not analyzed in this report.

NNWSI Interim Acceptance Specifications for Defense Waste Processing Facility and West Valley Demonstration Project Waste Forms and Canisterized Waste; V. Oversby; Lawrence Livermore National Laboratory Report UCID-20165; August 1984.

ABSTRACT

The waste acceptance specifications presented in this document represent the first stage of the NNWSI effort to establish specifications for the acceptance of waste forms for disposal at a nuclear waste repository in Yucca Mountain tuff. The only waste forms that will be dealt with in this document are the reprocessed waste forms resulting from solidification of the Savannah River Plant defense high level waste and the West Valley high level wastes. Specifications for acceptance of spent fuel will be covered in a separate document.

Potential Corrosion and Degradation Mechanisms of Zircaloy Cladding on Spent Nuclear Fuel in a Tuff Repository; A. Rothman; Lawrence Livermore National Laboratory Report UCID-20172, September 1984.

ABSTRACT

A literature review and analysis were made of corrosion and degradation processes applicable to Zircaloy cladding on spent nuclear fuel in a tuff repository. In particular, lifetime sought for the Zircaloy is 10,000 years. Among the potential failure mechanisms examined were: oxidation by steam, air, and water, including the effects of ions whose presence is anticipated in the water; mechanical overload; stress (creep) rupture; stress-corrosion cracking (SCC); and delayed failure due to hydride cracking.

The conclusion is that failure due to oxidation is not credible, although the few experiments are suggested to confirm the effect of aqueous fluoride on the Zircaloy cladding. Mechanical overload is not a problem, and failure from stress-rupture does not appear likely based on a modified Larson-Miller analysis. Analysis shows that delayed hydride cracking is not anticipated for the bulk of spent fuel pins. However, for a minority of pins under high stress, there is some uncertainty in the analysis as a result of: (1) uncertainty about crack depths in spent fuel claddings and (2) the effect of slow cooling on the formation of radially oriented hydride precipitates. Experimental resolution is called for. Finally, insufficient information is currently available on stress-corrosion cracking. While evidence is presented that SCC failure is not likely to occur, it is difficult to demonstrate this conclusively because the process is not clearly understood and data are limited. Further experimental work on SCC susceptibility is especially needed.

NNWSI Phase II Materials Interaction Test Procedure and Preliminary Results; J. K. Bates and T. J. Gerding; Argonne National Laboratory Topical Report in press; September 1984.

ABSTRACT

The Nevada Nuclear Waste Storage Investigations Project (NNWSI) is investigating the volcanic tuff beds of Yucca Mountain, Nevada, as a potential location for a high-level radioactive waste repository. This report describes a test method (Phase II) that has been developed to measure the release of radionuclides from the waste package under simulated repository conditions, and provide information on materials interactions that may occur in the repository. The results of 13 weeks of testing using the method are presented, and an analog test is described that investigates the relationship between the test method and expected repository conditions.

Corrosion Behavior of Carbon Steels Under Tuff Repository Geochemical Environments; D. McCright, H. Weiss, Proceedings of the Materials Research Society Meeting, Boston, MA, November 1984, paper N2.7 (in press); available as Lawrence Livermore National Laboratory Report UCRL-90875; October 1984.

ABSTRACT

Carbon steels may be used for borehole liners in a potential high-level nuclear waste repository in tuff in Nevada. Borehole liners are needed to facilitate emplacement of the waste packages and to facilitate retrieval of the packages, if required. Corrosion rates of low carbon structural steels AISI 1020 and ASTM A-36 were determined in J-13 well water and in saturated steam at 100°C. Tests were conducted in air-sparged J-13 water to attain more oxidizing conditions representative of irradiated aqueous environments. A limited number of irradiation corrosion and stress corrosion tests were performed. Chromium-molybdenum alloy steels and cast irons were also tested. These materials showed lower general corrosion but were susceptible to stress corrosion cracking when welded.

Test Plan for Series 2 Spent Fuel Cladding Containment Credit Tests; C. N. Wilson; Hanford Engineering Development Laboratory; submitted under subcontract to Lawrence Livermore National Laboratory; HEDL-TC-2353-3; October 1984.

ABSTRACT

LLNL has chosen Westinghouse Hanford Company (WHC) as a subcontractor to assist them in determining the requirements for successful disposal of spent fuel rods in the Yucca Mountain Site.

This test plan describes a second series of tests to be conducted by WHC to evaluate the effectiveness of breached cladding as a barrier to radionuclide release in the NNWSI-proposed geologic repository. These tests will be conducted at the Hanford Engineering Development Laboratory (HEDL), which is operated by WHC for DOE. A first series of tests, initiated at HEDL during FY 1983, demonstrated specimen preparation and feasibility of the testing concept. The second series tests will be similar to the Series 1 tests with the following exceptions:

- NNWSI reference groundwater obtained from well J-13 will be used as the leachant instead of deionized water
- Fuel from a second source will be used
- Certain refinements will be made in specimen preparation, sampling, and analytical procedures

Transport Properties of Topopah Spring Tuff; W. Lin and W. Daily; Lawrence Livermore National Laboratory Report UCRL-53602 (in press); October 1984.

ABSTRACT

This paper discusses electrical resistivity, ultrasonic P-wave velocity, and water permeability which were measured simultaneously on both intact and fractured Topopah Spring tuff samples at confining pressures of 5.0 MPa, pore pressures to 2.5 MPa, and temperatures to 140°C. Results are given for the tested samples which were subjected to three dehydration and rehydration cycles. The dehyrations were accomplished at a temperature of 140°C, and the rehydrations were accomplished at various combinations of temperature and pore pressures so that the wetting fluid was either liquid water, steam, or both.

Behavior of Stressed and Unstressed 304L Specimens in Tuff Repository Environmental Conditions; M. Juhas, D. McCright, W. Garrison; submitted to Corrosion 85, Boston, MA, March 25-29, 1985, paper #117; available as Lawrence Livermore National Laboratory Report UCRL-91804; November 1984.

ABSTRACT

This paper presents preliminary results of an investigation of the behavior of candidate barrier material for high level nuclear waste storage, type 304L stainless steel, in tuff repository environmental conditions. Tuff is a density welded, devitrified, igneous rock common to the proposed repository site at Yucca Mountain, Nevada. The results discussed include: irradiation corrosion tests, U-bend irradiation corrosion tests, slow strain rate tests, and bent beam stress corrosion tests. Results indicate that type 304L stainless steel shows excellent resistance to general, localized, and stress corrosion under the environmental and microstructural conditions tested so far. The environmental test conditions are 50-100°C J-13 well water (non-saline, near neutral pH, and oxic in nature) and saturated steam at 100°C. Microstructural conditions include solution annealed and long furnace heat treatments to provoke a sensitized structure. However, this particular type of stainless steel may be susceptible to long-term, low-temperature sensitization because of the combination of expected time at elevated temperature and residual stress in the container after emplacement in the repository. Other grades of austenitic stainless steels are reported to be more resistant to low-temperature sensitization. Future work will therefore include more extensive testing of these grades.

Application of the Ruthenium and Technetium Thermodynamic Data Bases Used in the EQ3/6 Geochemical Codes; D. Isherwood; Lawrence Livermore National Laboratory Report UCRL-53594; November, 1984. (in preparation)

ABSTRACT

Based on a critical review of the available thermodynamic data, computerized data bases for technetium and ruthenium were created for use with the EQ3/6 geochemical computer codes. The technetium data base contains thermodynamic data for 8 aqueous species and 15 solids. Twenty-six aqueous species and 9 solids were included in the ruthenium data base. Eh-pH diagrams were generated for a variety of conditions using the SOLUPLOT code. The EQ3NR code was used to calculate solubility limits for ruthenium (1×10^{-15} M) in ground water from Yucca Mountain, a potential nuclear waste repository site. The code confirmed the essentially unlimited solubility of technetium in oxidizing conditions. Ruthenium migration observed from the Cambric nuclear event site at the Nevada Test Site was evaluated. The solubility limit for ruthenium (as the aqueous species RuO_4) when constrained by RuO_2 is approximately equal to the concentration of ruthenium found in the cavity ground water (i.e., 2.4×10^{-11} M). Differences in solubility limits between Yucca Mountain and Cambric are primarily due to differences in groundwater pH. Technetium solubility (2×10^{-14} M) estimated for moderately reducing conditions (Eh=-0.1 v) is within the range of most calculated and experimental values previously reported, however it is significantly lower than experimental values recently published in a study of technetium sorption on basalt.

Application of the Ruthenium and Technetium Thermodynamic Data Bases Used in the EQ3/6 Geochemical Codes; D. Isherwood; Lawrence Livermore National Laboratory Report UCRL-53594; November, 1984. (in press)

ABSTRACT

Based on a critical review of the available thermodynamic data, computerized data bases for technetium and ruthenium were created for use with the EQ3/6 geochemical computer codes. The technetium data base contains thermodynamic data for 8 aqueous species and 15 solids. Twenty-six aqueous species and 9 solids were included in the ruthenium data base. Eh-pH diagrams were generated for a variety of conditions using the SOLUPLOT code. The EQ3NR code was used to calculate solubility limits for ruthenium (1×10^{-15} M) in ground water from Yucca Mountain, a potential nuclear waste repository site. The code confirmed the essentially unlimited solubility of technetium in oxidizing conditions. Ruthenium migration observed from the Cambric nuclear event site at the Nevada Test Site was evaluated. The solubility limit for ruthenium (as the aqueous species RuO_4^-) when constrained by RuO_2 is approximately equal to the concentration of ruthenium found in the cavity ground water (i.e., 2.4×10^{-11} M). Differences in solubility limits between Yucca Mountain and Cambric are primarily due to differences in groundwater pH. Technetium solubility (2×10^{-14} M) estimated for moderately reducing conditions (Eh=-0.1 v) is within the range of most calculated and experimental values previously reported, however it is significantly lower than experimental values recently published in a study of technetium sorption on basalt.

Dachiardite Formation by Hydrothermal Alteration of a Devitrified High-Silica Rhyolite; K. Knauss, J. Beiriger; submitted to Am. Mineral; available as Lawrence Livermore National Laboratory Report UCRL-90872, November 1984.

ABSTRACT

In support of the Nevada Nuclear Waste Storage Investigation Project experiments are conducted to determine changes that result from hydrothermal interaction of rock and water representative of a potential repository in tuff. Polished core wafers of tuff are reacted at 250°C with a natural ground water in gold-cell rocking autoclaves that are periodically sampled under in situ conditions. Complete water chemistry analyses are made and at the conclusion of the run the wafers are observed with SEM and solids analyzed with EMP using both EDS and WDS. Quantitative aqueous and solid phase analyses are presented.

The dominant secondary mineral formed during these experiments is Ca-rich dachiardite, a rare high-silica zeolite in the mordenite group. The dachiardite occurs most commonly in two forms: as large single crystals (dominant [010] and smaller [100], both elongated in the c-direction, and well-terminated) with smaller interpenetrant twins on the dominant face; and as rosettes of many crystals each elongated along the c-axis. XRD powder diffraction patterns are used to calculate cell parameters for crystals picked from the surface of the tuff wafers. Step-scan analyses are made to determine chemical zonation in single crystals. Experiments run at different pressures show no effects on habit or composition. Coexisting mordenite is compositionally distinct containing subequal Na, while the dachiardite was Na-poor.

Spent Fuel Cladding Characteristics and Choice of Experimental Specimens for Cladding-Corrosion Evaluation Under Tuff Repository Conditions; H. D. Smith; Hanford Engineering Development Laboratory; submitted under subcontract to Lawrence Livermore National Laboratory; HEDL-TC-2530; November 1984.

ABSTRACT

Lawrence Livermore National Laboratory has a program to evaluate cladding corrosion (the most likely form of cladding degradation) under potential repository conditions as part of their Waste Package Task for the NNWSI project. Westinghouse Hanford Company has been subcontracted to assist in evaluating cladding corrosion.

The objectives of the Westinghouse Hanford corrosion testing program of spent fuel cladding are to specifically identify and determine the rate of corrosion processes by which spent fuel cladding will be degraded under potential repository conditions. To accomplish this we plan to set up experiments in which the repository conditions are reproduced environmentally and geometrically as closely as possible. It is necessary to do this because there is little data on Zircaloy corrosion under expected repository conditions and there are a multiplicity of corrosion environments in the repository system to be evaluated.

Experimental samples must be chosen so that the full spectrum of characteristics developed in and on the cladding during their reactor residence and subsequent storage are represented in the tests, because of the lack of data which would allow us to dismiss certain characteristics as of no importance to corrosion behavior. This report summarizes pertinent characterization work that has been performed on spent fuel cladding and discusses the choice of material for experimental evaluation.

NNWSI Waste Form Performance Test Development: J. K. Bates, and T. J. Gerding (Argonne National Laboratory); Proceedings of the Materials Research Society Meeting; Boston, MA; November 1984 (in press).

ABSTRACT

A test method has been developed to measure the release of radionuclides from the waste package under simulated NNWSI repository conditions, and to provide information concerning materials interactions that may occur in the repository. Data from 13 weeks of unsaturated testing are discussed and compared to that from a 13 week analog test. The data indicate that the waste form test is capable of producing consistent, reproducible results that will be useful in evaluating the role of the waste package in the long-term performance of the repository.

Behavior of Carbon-14 in Waste Packages for Spent Fuel in a Repository in Tuff; R. Van Konynenburg, C. Smith, H. Culham, C. Otto; Proceedings of the Materials Research Society Meeting, Boston, Massacussetts, November 1984 (in press); available as Lawrence Livermore National Laboratory Report UCRL-90855, November 1984

ABSTRACT

Analysis of gas from a heated air-filled canister containing a spent fuel assembly before and after rupture of a fuel rod shows that about 1.5 mCi of ^{14}C from the external surface of the assembly was rapidly oxidized and released as $^{14}CO_2$ in excess oxygen at 275°C and 10^4 rad/hr. After rupture, an additional 0.3 mCi was released, probably also from the external surface. The total ^{14}C inventory in the entire 15x15 rod assembly including structural hardware is estimated to be 690 mCi. These measurements indicate that account will have to be taken of the time distribution of lifetimes of the canisters, and a broad definition of the "engineered system" may be necessary, in order to meet 10CFR60 requirements with spent fuel in a repository in tuff.

Geochemical Models Applied to Nuclear Waste Problems: D. Isherwood; Proceedings of the US-FRG Workshop on Geochemistry of Radionuclide Migration, December 1984; Lawrence Livermore National Laboratory Report UCRL-91790; December 1984.

ABSTRACT

This paper describes the geochemical modeling work now ongoing for the nuclear waste management projects at Lawrence Livermore National Laboratory. It centers around the use and development of the EQ3/6 code package which is made up of two major codes, EQ3NR and EQ6. EQ3NR calculates from water sample analyses the distribution of ions, ion-pairs, and complexes, and determines whether the water sample is saturated with various minerals (Wolery, 1983). EQ6 calculates dynamic models of rock/water interactions, that is, minerals and other phases can be added to a chemical system such that the state of a new system is predicted (Wolery, 1984).

Parametric Testing of a DWPF Glass; F. Bazan and J. Rego; Lawrence Livermore National Laboratory Report UCRL-56606 (in press); December 1984.

ABSTRACT

A series of tests have been performed to characterize the chemical stability of a DWPF borosilicate glass sample as part of the Waste Package Task of the NNWSI Project. This material was prepared at the Savannah River Laboratory for the purpose of testing the 165-frit matrix doped with a simulated non-radioactive waste. All tests were conducted at 90°C using deionized water and J-13 water (a tuffaceous formation groundwater). In the deionized water tests, both monoliths and crushed glass were tested at various ratios of surface area of the sample to volume of water in order to compare leach rates for different sample geometries or leaching times. Effects on the leach rates due to the presence of crushed tuff and stainless steel material were also investigated in the tests with J-13 water.

Department of Energy
Nevada Operations Office
P. O. Box 14100
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P. T. Prestholt
NRC Site Representative
1050 East Flamingo Road
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SITE SPECIFIC AGREEMENT - INFORMATION TRANSMITTAL

In accord with Sections 3A and 3C of the Site Specific Agreement, we are providing, as attachments to this letter, the following information:

1. Inventories of Reports, Plans, and Procedures provided by Lawrence Livermore National Laboratory (dated January, 1985) and Sandia National Laboratory (dated May, 1984 with additional input through December, 1984).

2. Data catalogs for SNL (dated January 15, 1985) and LLNL (dated January, 1985).

3. List of Planned Field and Laboratory Tests for LLNL (dated November 15, 1984).

We recognize that the attached material comprises only part of the information covered in Section 3 of the agreement and we will be providing the balance to you as soon as it is received in my office. Furthermore, we anticipate standardizing the report format and content in the near future so that both our preparation will be simplified and the reports will be more useful to the NRC.

Please contact J. S. Szymanski of my office if you have any questions or comments.

Donald L. Vieth, Director
Waste Management Project Office

WMPO:JSS-634

Enclosures:
As stated

cc w/o encl:
T. O. Hunter, SNL, 6310, Albuquerque, NM
L. D. Ramspott, LLNL, Livermore, CA
W. W. Dudley, Jr., USGS, Denver, CO
D. T. Oakley, LANL, Los Alamos, NM
J. B. Wright, W, NTS
M. E. Spaeth, SAIC, Las Vegas, NV
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N. K. Stablein, NRC, Washington, D.C.
C. R. Head, DOE/HQ (RW-23), FORSTL

SANDIA NATIONAL LABORATORIES

NNWSI DATA INDEX

JANUARY 15, 1985

January 15, 1985

SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick
FILE LOCATION: 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp.,
Salt Lake City, Utah
3. Los Alamos National Laboratory (LANL)
4. SNL Division 1542, Bldg. 823

	Category	Description and Number of Tests*	File Location
1.	Mechanical/ Compressive	Characterization of the Bullfrog Member in USW G-1 • 95 tests	1,2
2.	Mechanical/ Compressive	Characterization of Tuffs from Hole UE-25a#1 • 5 Tiva Canyon, 5 Topopah Spring, 5 Calico Hills, 5 Prow Pass, and 4 Bullfrog	4
3.	Mechanical/ Compressive	Characterization of tuffs from Grouse Canyon - G-Tunnel MTS • 20 tests	4
4.	Mechanical/ Compressive	Comparison of Test Equipment • 49 tests	1,2
5.	Mechanical/ Compressive	Support of G-Tunnel in-situ tests• 9 tests	2
6.	Mechanical/ Tensile	Support of G-Tunnel in-situ tests• 6 tests	1,2
7.	Mechanical Compressive	Characterization of the Tuffaceous Beds of Calico Hills in USW G-1 • 70 tests	2
8.	Mechanical/ Fracture	Determine shear and normal stiffness of rock fractures • 2 Busted Butte Topopah Spring Tests ongoing and 23 planned	1,4
9.	Mechanical/ Compressive	Characterization of Tram Member in USW G-1 • 42 tests	1
10.	Mechanical/ Compressive	Examination of Acoustic Emissions of welded tuff • 9 tests	4
11.	Mechanical/ Compressive	Characterization of the Topopah Spring Member in USW G-1 • 22 tests	1

*Tests are completed unless otherwise noted.

SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick
FILE LOCATION: 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp.,
Salt Lake City, Utah
3. Los Alamos National Laboratory (LANL)

	Category	Description and Number of tests*	File Location
12.	Mechanical/ Compressive	Characterization of the Prow Pass Member in USW G-1 • 2 tests	1,2
13.	Mechanical/ Compressive	Characterization of the Topopah Spring Member in USW G-2 • 36 tests	2
14.	Mechanical/ Compressive	Characterization of Prow Pass, Topopah Spring, Calico Hills and Bullfrog Members in USW G-U3 • 16 tests	1,3
15.	Mechanical/ Compressive	Characterization of the Topopah Spring Member in USW G-4 • 57 tests	1 or 2
16.	Mechanical/ Compressive	Testing to determine parameter effects of mechanical properties of Topopah Spring Member • 62 tests planned or ongoing	1
17.	Mechanical/ Compressive	Creep testing on Topopah Spring Member of Busted Butte outcrop samples • 10 ongoing tests	3
18.	Mechanical/ Compressive	Determination of effect of sample size on mechanical properties of Busted Butte Topopah Spring Member • 16 tests	1
19.	Mechanical/ Misc.	Cutting force determination for evaluation of mining machine requirements • 2 Topopah Spring Samples (1 lithophysal and 1 nonlithophysal) from the Busted Butte outcrop	1
20.	Mechanical/ Compressive	Effects of lithophysae on the mechanical properties of large diameter Topopah Spring Samples from the Busted Butte outcrop • 10 tests	4

*Tests are completed unless otherwise noted.

January 15, 1985

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick (6313)
FILE LOCATION: 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp. (Research Division)
Salt Lake City, UT

	Category	Description and Number of Tests*	File Location
1.	Thermal conductivity	Characterization of the Bullfrog member in USW G-1. Includes: 17 Bullfrog, 3 Tram 4 Prow Pass, 12 Calico Hills, and 15 Topopah Spring.	1,2
2.	Thermal conductivity	Characterization of the Topopah Spring member and tuffaceous beds of Calico Hills in USW G-4. Includes: 4 Topopah Spring and 3 Calico Hills.	1,2
3.	Thermal conductivity	Characterization of tuff from USW G-2. Includes: 11 Calico Hills, 2 Topopah Spring, 3 Bullfrog and 3 Tram.	1,2
4.	Thermal conductivity	Characterization of tuff from UE-25b#1. Includes: 3 Bullfrog and 3 Tram.	1,2
5.	Thermal conductivity	Characterization of tuff from USW GU-3. Includes: 4 Topopah Spring, 2 Calico Hills, 1 Prow Pass, and 2 Bullfrog.	1,2
6.	Thermal conductivity	Characterization of tuff from drill holes in G-Tunnel. Includes: 3 Grouse Canyon (U12G-HB-MPBX #1, #2); 3 Grouse Canyon (SDH#1); and 3 Tunnel Bed Five (SDH#1); 6 Grouse Canyon (U12g-RM-P1).	1,2
7.	Thermal conductivity	Lithophysal effects on thermal conductivity of Topopah Spring member. Ongoing tests include: 6 lithophysal Topopah Spring from the Busted Butte outcrop.	1,2
8.	Thermal conductivity	Characterization of pure zeolites (commercially obtained). Includes: 4 pure zeolite samples.	1,2
9.	Thermal conductivity	Comparative testing techniques examination. Includes: 1 Calico Hills and 2 Tram from USW G-1.	1

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick
FILE LOCATION: 1. SNL Division 6313, Bldg. 634
2. Terra Tek Corp., Salt Lake City, Utah

	Category	Description and Number of Tests*	File Location
1.	Thermal Expansion Testing (confined)	Characterization of the Bullfrog Member in USW G-1;. Includes: 19 Bullfrog, 6 Tram, 4 Prow Pass, 12 Calico Hills and 3 Topopah Spring.	1,2
2.	Thermal Expansion Testing (confined)	Characterization of tuff from USW G-2. Includes: 13 Calico Hills, 2 Topopah, 3 Bullfrog and 3 Tram.	1,2
3.	Thermal Expansion Testing (confined)	Characterization of tuff from USW GU-3. Includes: 3 Topopah Spring, 2 Calico Hils and 1 Prow Pass.	1,2
4.	Thermal Expansion Testing (confined)	Characterization of tuff from USW G-4. Includes: 4 Topopah Spring and 3 Calico Hills.	1,2
5.	Thermal Expansion Testing (confined)	Characterization of tuff from UE-25b#1. Includes: 3 Bullfrog and 3 Tram.	1,2
6.	Thermal Expansion Testing (confined)	Characterization of G-Tunnel tuff in support of in situ tests and characterization of zeolitic tuffs. Includes: 6 Grouse Canyon - 3, U12G-Rm-P1 and 3, U12G-HB-MPBX#1, #2; and 4 Tunnel Bed Five (SDH#3).	1,2
7.	Thermal Expansion Testing (confined)	Lithophysal effects on thermal expansion of Topopah Spring Member. Includes: 6 lithophysal samples from the Busted Butte outcrop.	1,2
8.	Thermal Expansion Testing (confined)	Evaluation of variation in data in thermal expansion testing/bondline compaction. Includes: 2 tests from Calico Hills in USW G-1 and 2 Topopah Spring tests from the Busted Butte outcrop.	2

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABS (SNL)
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SNL CONTACT: Barry Schwartz
FILE LOCATION: 1. SNL Division 6313, Bldg. 634

	Category	Description and Number of Test*	File Location
1.	Thermal Expansion Testing (unconfined)	Characterization of stratigraphy in USW G-1. Includes: 52 Topopah Spring, 32 Calico Hills, 17 Prow Pass, 59 Bullfrog and 72 Tram.	1
2.	Thermal Expansion Testing (unconfined)	Characterization of the Calico Hills Member in USW G-2. Includes: 6 tests.	1
3.	Thermal Expansion Testing (unconfined)	Characterization of Topopah Spring Member and Calico Hill member in support of the LANL "Soak Test". Includes: 21 Topopah Spring and 33 Calico Hills.	1
4.	Thermal Expansion Testing (unconfined)	Support of G-tunnel in situ tests and tunnel bed 5 characterization. Includes: 6 U12G RMP1 and 6 Tunnel Bed Five samples.	1

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick
FILE LOCATION: 1. SNL Division 6313, Bldg. 823

	Category	Description and Number of Tests*	File Location
1.	Mineralogic Characterization	Support of mechanical and thermal testing on tuff samples from hole USW G-1. Includes: 30 Bullfrog Member, 11 Calico Hills, 2 Prow Pass, 10 Tram and 13 Topopah Spring. An additional 12 Topopah Spring samples are ongoing.	1
2.	Mineralogic Characterization	Support of mechanical and thermal testing on tuff samples from USW G-2. Includes: 17 Calico Hills, 6 Topopah Spring and 4 Bullfrog.	1
3.	Mineralogic Characterization	Support of hydrologic properties testing on tuff samples from USW GU-3. Includes 2 Calico Hills, 1 Tiva Canyon and 4 Topopah Spring.	1
4.	Mineralogic Characterization	Support of hydrologic properties testing on tuff samples from USW G-4 and Pure zeolite (commercial source). Includes: 1 Calico Hills, 2 Tiva Canyon, 4 Topopah Spring, 2 Prow Pass and 1 Pure zeolite.	1
5.	Mineralogic Characterization	Support of thermal and mechanical properties testing on tuff samples from UE-25a#1. Includes: 1 Calico Hills, 1 Topopah Spring, 2 Prow Pass and 3 Bullfrog.	1
6.	Mineralogic Characterization	Support of thermal and mechanical tests on tuff samples from G-Tunnel. Includes 9 Grouse Canyon, 1 from HFS#36 (unknown formation) and 1 from Inst5 #2 (unknown formation).	1
7.	Mineralogic Characterization	Support of mechanical tests on lithophysal and non-lithophysal Topopah Spring tuff from the Busted Butte outcrop. Includes: 26 lithophysal samples completed and 14 non-lithophysal samples ongoing.	1

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick (6313)
FILE LOCATION 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp. (Core Services Division)
Salt Lake City, UT
3. Holmes and Narver, NTS, Mercury, NV

	Category	Description and Number of Tests*	File Location
1.	Physical properties	Characterization/support of mechanical and thermal property testing on tuff samples from USW G-1. Includes: 76 Bullfrog, 77 Tram, 43 Prow Pass, 40 Calico Hills, 38 Topopah Spring, 4 Flow Breccia, 7 lithic rich, 4 older tuffs, (Unit A), 2 older tuffs (Unit B) 8 older tuffs (Unit C), 1 pure bentonite clay, and 2 unidentified.	1
2.	Physical properties	Characterization/support of mechanical and thermal testing on samples from USW G-2, USW GU-3, UE-25b#1, USW G-1, and drill holes in G-Tunnel. Includes: 2 Topopah Spring; 3 Bullfrog and 3 Tram from USW G-2; 4 Topopah Spring; 2 Calico Hills; 1 Prow Pass and 2 Bullfrog from USW GU-3; 23 Prow Pass; 37 Bullrog and 71 Tram from UE-25b#1; 5 Bullfrog and 2 Tram from USW G-1; 6 Grouse Canyon from G-Tunnel.	1
3.	Physical properties	Support of mechanical testing on samples from the Topopah Spring member from USW GU-3. Includes: 35 Topopah Spring from USW GU-3.	1
4.	Physical properties	Characterization/support of mechanical testing on Topopah Spring member samples from the Busted Butte outcrop. Includes: 28 Topopah Spring samples from Busted Butte.	1,2
5.	Physical properties	Characterization of lithophysal Topopah Spring member from Busted Butte. Includes: 20 lithophysal Topopah Spring samples.	2

*Tests are completed unless otherwise noted.

SANDIA NATIONAL LABORATORIES (SNL)
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SNL CONTACT: Fran Nimick (6313)
FILE LOCATION 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp. (Core Services Division)
Salt Lake City, UT
3. Holmes and Narver, NTS, Mercury, NV

	Category	Description and Number of Tests*	File Location
6.	Physical properties	Characterization of USW GU-3 stratigraphy. Includes: 55 Topopah Spring, 20 Tiva Canyon, 7 Calico Hills, 22 Prow Pass, and 39 Bullfrog from USW GU-3.	-
7.	Physical properties	Support of G-Tunnel in situ tests. Includes: 12 Grouse Canyon and 3 Tunnel Bed five samples.	1
8.	Physical properties	Characterization of tuff units from . USW G-2. Includes: 40 Prow Pass, 42 Topopah Spring, 42 Calico Hills, 14 Bullfrog, 23 Tram, 2 Yucca Mountain, 6 bedded tuffs, 33 lithic rich, 5 devitrified lava and flow breccia, 15 rhyolite lava and flow breccia, 19 quartz latite lava and flow breccia, 10 dacite lava and flow breccia, and 3 older tuffs.	1
9.	Physical properties	Characterization of tuff units from UE-25a#1. Includes: 3 Calico Hills and 9 Prow Pass.	1
10.	Physical properties	Characterization of tuffs in USW VH-1. Includes: 6 Prow Pass and 11 Bullfrog.	1
11.	Physical properties	Characterization of tuff units in USW G-4. Includes: 59 Topopah Spring, 26 Calico Hills, 32 Prow Pass, 1 Pah Canyon, 3 Tiva Canyon, 30 Bullfrog, and 4 Tram.	1,2,3

*Tests are completed unless otherwise noted.

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Fran Nimick (6313)
FILE LOCATION 1. SNL Division 6313, Bldg. 823
2. Terra Tek Corp. (Core Services Division) Salt Lake City, UT
3. Holmes and Narver, NTS, Mercury, NV

	Category	Description and Number of Tests*	File Location
12.	Physical properties	Characterization in support of thermal conductivity testing on lithophysal Topopah Spring member from Busted Butte outcrop. Includes: 6 lithophysal Topopah Spring.	1
13.	Physical properties	Characterization of the Tiva Canyon/ Topopah Spring members in outcrop at Yucca Mountain (in cooperation with B. Scott, USGS). Includes: 150 total samples from Tiva Canyon and Topopah Spring.	1
14.	Physical properties	Characterization of pure zeolites. Includes: 4 commercially procured pure zeolites, 4 Tunnel Bed five (SDH #3) samples, and 4 Grouse Canyon samples from SDH #1 in G-Tunnel.	1

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABS (SNL)
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SNL CONTACT: Elmer Klavetter
FILE LOCATION: 1. SNL Division 6313, Bldg. 823
2. SNL Division 1511, Bldg. 823
3. Pacific Northwest Laboratory (PNL)
Richland, WA

	Category	Description and Number of Tests*	File Location
1.	Water retention characteristics of matrix	Determine drying and imbibition characteristics of tuff in support of unsaturated hydrologic analysis, also an instrumentation check for initial hydrologic investigation in tuff. Method used: gamma beam attenuation technique. One Crouse Canyon (C-Tunnel) test.	2
2.	Water retention characteristics of matrix	Supporting unsaturated hydrology calculations and property variability investigations. Method used: thermocouple psychrometer. Twenty-nine samples from USW G-4, 1 sample from USW G-1, 1 sample from the Busted Butte outcrop and 19 samples from USW GU-3. Testing on an additional 14 samples is ongoing.	1,3
3.	Water retention characteristics of matrix	Perform transient water/water vapor migration experiments and capillary pressure vs liquid saturation relationship determination in support of succeeding experiments and in support of code modeling. Method: pressure vessel with gamma beam attenuation for water content monitoring. Two Busted Butte Topopah Spring tests are planned.	1,2
4.	Water Permeability tests on fractured, saturated sample	Determine fracture permeability as a function of stress in support of hydrologic calculations to estimate rockmass permeability and as a function of time and stress in support of other hydrologic experimental design and analysis. Method: Permeability pressure cell. Completed tests include: 2 Topopah Spring from USW G-1; 3 Topopah Spring, 1 Calico Hills and 1 Prow Pass from USW G-4. Ongoing tests include 2 Topopah Spring from USW G-4	1,2

*Tests are completed unless otherwise noted.

January 15, 1985

SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Elmer Klavetter
FILE LOCATION:
1. SNL Division 6313, Bldg. 823
2. SNL Division 1511, Bldg. 634
3. SNL Division 1512, Bldg. 634
4. Pacific Northwest Laboratory (PNL) Richland, WA

	Category	Description and Number of Tests*	File Location
1.	Water permeability tests of unsaturated matrix	Determine relative permeability of tuff in support of unsaturated hydrologic analyses. Method used: Pressure vessel used with gamma beam attenuation for saturation monitoring. One Topopah Spring sample from the Busted Butte outcrop is planned.	3
	Water permeability tests of saturated matrix-thermal dependence	Determine liquid permeability at different temperatures in support of near-field hydrologic calculations; initial data. Method used: Permeability pressure vessel. 1 Topopah Spring sample from the Busted Butte outcrop is planned.	1
3.	Gas permeability tests on saturated matrix	Determine gas permeability in support of unsaturated flow calculations; to be used in near-field modeling calculations. Method used: Gas permeability pressure vessel. 1 Topopah Spring sample from the Busted Butte outcrop is ongoing.	1
4.	Water permeability tests on saturated matrix	Hydrologic experiments in support of analysis and modeling efforts, including the computer code "TOUGH" and permeability variation investigations. Method: permeameter. Completed tests include: 2 Topopah Spring from Busted Butte; Tiva Canyon; 5 Topopah Spring; 3 Prow Pass and 3 Calico Hills from USW GU-3; 1 Topopah Spring from USW G-1; 14 Topopah Spring, 6 Calico Hills, 9 Prow Pass, 4 Tiva Canyon, 1 Pah Canyon and 2 Bullfrog from USW G-4. Ongoing tests include: 8 Topopah Spring, 3 Calico Hills and 6 Prow Pass from USW G-1; 5 Topopah Spring from USW GU-3; 3 Tiva Canyon, 1 Pah Canyon; 9 Topopah Spring; 4 Calico Hills; and 1 Prow Pass from USW G-4. One Calico Hills from USW G-4 is planned.	1,4

*Tests are completed unless otherwise noted.

January 15, 1985

SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Elmer Klavetter
FILE LOCATION: 1. SNL Division 6313, Bldg. 823

	Category	Description and Number of Tests*	File Location
1.	Pore Size Distribution	Supporting tuff matrix structural characterization. Initial investigation of tuff matrix. Method: Mercury Porosimeter. Includes: 4 Prow Pass, 4 Bullfrog and 10 Tram from USW G-1.	1
2.	Pore Size Distribution	Supporting radionuclide transport calculations and experiment definition. Method: Mercury Porosimeter. Includes: 14 Tunnel Bed Five (G-Tunnel) samples.	1
3.	Pore Size Distribution	Estimate pore size distribution in support of unsaturated hydrologic property calculations. Method: Mercury Porosimeter. Includes: 2 Tiva Canyon, 1 Pah Canyon, 6 Topopah Spring, 4 Calico Hills, 6 Prow Pass and 2 Bullfrog from USW G-4.	1
4.	Physical Properties	Determination of dry bulk densities, grain density and calculations of porosity and degree of saturation in support of hydrologic calculations, analyses, and experiments. Samples from different stratigraphy in holes USW G-1, USW G-2, USW GU-3, and USW G-4 totalling 185 were tested. An additional 20 samples are ongoing.	1

*Tests are completed unless otherwise noted.

January 15, 1985

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Joe Fernandez (6313)
FILE LOCATION: 1. Waterways Experimental Station
Structural Lab Bldg., Vicksburg, MI
2. Penn State University State College (PSU)
(Materials Research Lab)

	Category	Description and Number of Tests*	File Location
1.	Seal material evaluation of tuff concrete	Measure properties of concrete made using tuff as a coarse aggregate to establish basic properties of tuff concrete for use as a potential sealing component. Includes: 5 trial mix to obtain slump, 3 volumetric expansion for cement, 3 creep, 9 compressive strengths, 8 tensile strengths, and 9 permeability tests. Thirty-seven tests total.	1
2.	Seal material evaluation of tuff concrete	Characterize constituents of tuff concrete to establish initial premixture compositions. Includes: 6 mineralogical examinations of tuff (including X-ray diffraction and optical microscopy); 1 bulk specific gravity; 1 absorption; 1 grain density; and 4 chemical analysis of tuff. One test each of the chemistry of cement and flyash.	1
3.	Seal material evaluation of concrete/ mortar	Measure the mechanical properties cf concrete/mortar in G-Tunnel after exposure to nonwelded tuff. Included: 10 micrometric analysis tests, 19 petrography samples, 12 Hassler permeability tests, 18 soil permeability tests, 13 porosity tests, 15 compressive strength tests, 11 tensile strength tests, 10 P-wave/ S-wave tests; 108 tests total.	1

*Tests are completed unless otherwise noted.

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

	Category	Description and Number of Tests*	File Location
4.	Seal material evaluation	Perform analysis on old, cementitious-based materials. For the sealing program, the following analyses were performed on 28 samples: thin section preparation and petrographic examinations, SEM, including energy-dispersion X-ray analysis, X-ray diffraction analysis of matrix fractions, thermogravimetric analysis, and differential thermal analysis. In addition, 14 of the 28 samples had wet chemical analysis performed and 2 samples had electron microprobe analysis performed.	2
5.	Seal material evaluation of grout	Determine the mechanical and bulk properties of grout under various temperatures and varying times. Includes: 132 compressive strength, 132 static modulus, 64 dynamic modulus, 44 bulk density, 44 permeability; 28 thermal conductivity, 128 expansion bar, 44 X-ray, 44 porosity, and 33 mercury porosimetry. 693 tests total.	2
6.	Seal material evaluation	Determine the initial composition of fluids and materials used in grout formulation, as well as grout in its initially hardened state to enable a comparison of the initial composition with a final composition once exposed to elevated temperatures and pressures. These data will enable an interpretation of how the grout may alter after prolonged exposure in a tuff environment.	2

*Tests are completed unless otherwise noted.

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

	Category	Description and Number of Tests*	File Location
7.	Seal material evaluation of grout and concrete	Determine the mineralogical alterations of selected grout and concrete materials under accelerated conditions. Tests include: 2 rocking autoclave runs, 22 powder samples, including fluid analysis, 2 rocking autoclave runs; 1 powder and 4 monolith samples, including X-ray, SEM; optical microscopy and fluid analysis, Bridgeman static; 19 samples total; 1 monolith; 6 powder runs at 3 samples per run. Rocking autoclave; 33 powder samples total; 3 runs at 11 samples per run; and Bridgeman static; 32 monolith samples total, 8 runs at 4 samples per run. 111 tests total.	2

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABORATORIES (SNL)
NNWSI DATA INDEX FOR LABORATORY TESTING

SNL CONTACT: Tom Eglinton and Jim Neal (6311)
FILE LOCATION: 1. SNL Division 6311, Bldg. 823

	Category	Description and Number of Tests*	File Location
1.	Surface soil properties	Initial scoping tests of the material properties of soils in support of preliminary design evaluation of excavation and foundation conditions. Samples were taken from nine test pits in Area 25 at the Nevada Test Site. Tests included: sieve analysis, Atterberg limits (compressive test), maximum density at optimum moisture, moisture content and classification.	1

*Tests are completed unless otherwise noted.

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SANDIA NATIONAL LABS (SNL)
NNWSI DATA INDEX FOR FIELD TESTING

SNL CONTACT: Roger Zimmerman
FILE LOCATION: 1. SNL Division 6313-Bldg. 823
2. SNL Division 7123-Bldg. 880
3. Science Applications International, Corp. (SAIC) Las Vegas, NV

	Category	Description Including Test Location and Formation	File Location	Status
1.	Water migration experiment	Sixty-three day heater experiment was performed as an initial evaluation of thermally induced water migration in welded tuff at G-Tunnel. Data were collected for pre-test evaluations during the heating period and during the nearly two-month cooldown period.	1,2	Completed 1980
2.	Geological evaluation of rock mechanics drift	Characterization of the Grouse Canyon Member of the Belted Range tuff in G-Tunnel (includes the discontinuities within it and the extent of the rock unit) for the purpose of determining if sufficient welded tuff existed for GTUF experiments. Data include corehole logs and fracture maps.		Completed 1980
3.	Geotechnical Measurements	Borehole measurements in the Grouse Canyon tuff in G-Tunnel. Ambient temperature measurements were used to: 1) establish reference data as input to design of GTUF openings and experiments and 2) gain field test experience in welded tuff.	1,2	Completed October 1981
4.	Small Diameter Heater Experiment #1	Heater Experiment that measures temperature distributions and monitors water migration phenomena in welded tuff in G-Tunnel, (Grouse Canyon Formation). Data are used to evaluate conduction/radiation heat transfer models and to define the hydrothermal waste canister environment.	1,2	Completed May 1982

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SNL CONTACT: Roger Zimmerman
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2. SNL Division 7123-Bldg. 880
3. Science Applications International, Corp. (SAIC) Las Vegas, NV

	Category	Description Including Test Location and Formation	File Location	Status
5.	Small Diameter Heater Experiment #2	Heater Experiment that measures temperature distributions and monitors water migration phenomena in nonwelded tuff in G-Tunnel, (Tunnel Bed Five). Data are used to evaluate conduction/radiation heat transfer models and to define the hydrothermal waste canister environment.	1,2	Completed October 1982
6.	Small Diameter Heater Experiment #3	Heater experiment that measures temperature distribution & monitors water migration and thermal expansion phenomena in welded tuff in G-Tunnel (Grouse Canyon). Data are used to evaluate conduction/radiation heat transfer and a two-dimensional axisymmetric thermo-mechanical model with single-axis field measurements, and to define the waste canister environment.	1,2,3	Completed September 1984
7.	G-Tunnel Heated Block Experiment	Utilize excavations, flatjack pressure changes and heat fluxes in stages of slot cutting, ambient temperature and thermal cycle testing to evaluate coupled thermal, mechanical, and hydrothermal behavior of a large block (about $8m^3$) of jointed welded tuff (Grouse Canyon). Data are used as reference for development of numerical models and repository conceptual designs.	1,3	Completed October 1984

SANDIA NATIONAL LABS (SNL)
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SNL CONTACT: Roger Zimmerman
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3. Science Applications International, Corp. (SAIC) Las Vegas, NV

	Category	Description Including Test Location and Formation	File Location	Status
8.	G-Tunnel Pressurized Slot	Machine thin slots in welded tuff, insert flatjacks and monitor load-displacement response of the tuff. Quantities measured or calculated include tunnel surface stresses, mechanical deformation properties, and strength properties for use in developing repository conceptual designs.	1,3	Ongoing
9.	G-Tunnel Mining Evaluation	Evaluate: (1) responses of welded tuff to repository scale excavations for geomechanical jointed rock numerical model evaluations, (2) instrument placement and measurement techniques during mining activities, and (3) mining and drift stabilizing techniques for applications to repository conceptual designs and to serve as a prototype for ES testing.	1,3	Ongoing

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SNL CONTACT: Ken Young (6311)
FILE LOCATION: 1. SNL Division 1711, Bldg. 805

	Category	Description Including Test Location and Formation	File Location	Status
1.	Weapons Test Seismic	Data available at the end of FY78 were used to formulate a tentative equation for predicting peak vector acceleration at the Nevada test site.	1	Completed
2.	Weapons Test Seismic	Additional data were added which improve the prediction equation of SAND79-1002, and which show that the data sample was sufficiently large that additional data would provide little change in standard deviation.	1	Completed
3.	Weapons Test Seismic	Compares ground motion from the Massachusetts Mountain earthquake at NTS with that from four underground nuclear explosions, notes the differences, and relates the motion to siting a nuclear waste storage facility at NTS.	1	Completed
4.	Weapons Test Seismic	Ground motion from ten Pahute Mesa and 28 Yucca Flat underground nuclear explosions was measured at the surface and at depth at seven locations. Analysis shows how peak vector acceleration, velocity, and displacement change with depth for vertical, radial, and tangential motion. Fits to the data can be used as prediction equations.	1	Completed
5.	Weapons Test Seismic	Compares ground motion from earthquakes and underground nuclear weapons tests as it relates to siting a nuclear waste storage facility at NTS.	1	Completed
6.	Weapons Test Seismic	Data which addresses the effects of repository depth on ground motion--the Pahute Mesa data.	1	Completed

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SNL CONTACT: Jim Neal (6311)
FILE LOCATION: 1. SNL Division 1711, Bldg. 805

	Category	Description Including Test Location and Formation	File Location	Status
1.	Surface facility subsurface borings	Subsurface borings are obtained to determine alluvial thickness and nature of alluvial bedrock interface. Data are used for determining suitability of surface facilities by providing more detailed information for predicting the seismic performance of key facilities, such as the waste handling building. These data, although largely field data, contain some description of materials based on examinations conducted at the USGS core library (Mercury, NTS).	1	Ongoing

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Includes

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A U.S. DOE PROJECT

Note D86 & D87 are same

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MAY 1984

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
LAS VEGAS, NEVADA

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MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M152 LEVEL: 1 WBS: 2.1.1.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Jul 84	HQ PLANNED:	30 Aug 84
NVO EXPECTED:		HQ EXPECTED:	30 Aug 84
NVO ACTUAL:	23 Aug 84	HQ ACTUAL:	12 Sep 84

DESCRIPTION: Users Manual for Data Base System for Participants

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. The report will describe the procedures by which users can retrieve information from the data base containing technical information gained in the NWMSI Project. After revision to meet WMPO comments the report will be submitted to OCRWM through WMPO.

EVENT: M153 LEVEL: 1 WBS: 2.1.1.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	31 Jul 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jul 84	HQ ACTUAL:	31 Jul 84

DESCRIPTION: Letter Report Containing Comments and Recommendations on Generic Requirements (GR) Document Drafts

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV. SNL staff will assist DOE in the formulation and revision of the GR document and will, in the letter report, provide comments and recommendations concerning potential baselining.

EVENT: M103 LEVEL: 2 WBS: 2.1.1.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	31 Jan 85	HQ EXPECTED:	
NVO ACTUAL:	10 Jan 85	HQ ACTUAL:	

DESCRIPTION: Letter Report on Preliminary Assessment of Single or Dual Porosity Model

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV. The letter report will describe the results of preliminary calculations made to assess the relative applicability of single and dual-porosity flow models in simulating the anticipated water movement in Yucca Mountain. (See report SAND84-7202, "Hydrologic Mechanisms Governing Fluid Flow in Partially Saturated, Fractured, Pourous Tuff at Yucca Mountain." Reference SNL ltr mjh:6312 from T.O. Hunter to D.L. Vieth, WMPO/NV, dated 10-Jan-1985.)

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M129 LEVEL: 2 WBS: 2.1.1.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	16 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	16 May 84	HQ ACTUAL:	

DESCRIPTION: Postclosure Preliminary Performance Assessment for NNWSI EA

CRITERIA: This deliverable was met by submitting an unedited draft of Section 6.4.2, NNWSI EA, to WMPO/NV.

EVENT: M130 LEVEL: 2 WBS: 2.1.1.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	19 Sep 84	HQ PLANNED:	
NVO EXPECTED:	30 Nov 84	HQ EXPECTED:	
NVO ACTUAL:	21 Nov 84	HQ ACTUAL:	

DESCRIPTION: Draft Report Establishing Preliminary Bounds on the Performance of a Repository at Yucca Mountain

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. The report will describe calculations based on data and conceptual models for Yucca Mountain available during the spring of 1984. The data, conceptual models, and simplifying assumptions necessary for the calculations will be summarized. The calculations will show a range of expected behavior at Yucca Mountain with respect to each of NRC's and EPA's requirements for the long-term performance of a repository. The results will be used in the NNWSI Environmental Assessment to support conclusions about compliance of the Yucca Mountain site with the requirements in DOE's siting guidelines.

EVENT: M164 LEVEL: 1 WBS: 2.1.1.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	30 May 84	HQ PLANNED:	30 May 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 May 84	HQ ACTUAL:	30 May 84

DESCRIPTION: Preliminary Parametric Studies with a Simplified Model of the Proposed Yucca Mountain Nevada Waste Disposal System

CRITERIA: This deliverable was a special study requested by DOE/HQ. A draft report titled "Preliminary Parametric Studies with a Simplified Mathematical Model of a Proposed Nuclear Waste Disposal System, Yucca Mountain, Nevada" by Y. T. Lin and M. S. Tierney, was submitted to WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M108 LEVEL: 1 WBS: 2.1.1.S RESP: SNL STATUS: B WMPO RESP: Witherill

NVO PLANNED: 30 Aug 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED: 30 Aug 85
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: System Engineering Management Plan (SEMP)

CRITERIA: A Systems Engineering Management Plan (SEMP) describing the methods the NNWSI Project will use to ensure that the requirements identified in the Systems Description are translated faithfully into site characterization and design will be completed. The SEMP will either be a stand-alone document or the requirements for the SEMP will be incorporated into existing or proposed NNWSI Project documentation.

EVENT: M197 LEVEL: 2 WBS: 2.1.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 28 Jun 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: QA Procedure for the Interface Graphics System (IGIS) Data Base

CRITERIA: This deliverable will be a QAP for this system.

EVENT: N113 LEVEL: 1 WBS: 2.1.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 30 Aug 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED: 30 Sep 85
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Performance Assessment Plan

CRITERIA: The deliverable will be met by submitting a report, SAND85-0009, "Performance-Assessment Plan for the Nevada Nuclear Waste Storage Investigations," to WMPO/NV. The report will describe the plans for assessing the preclosure and postclosure performance of a repository at Yucca Mountain. Because its principal purpose will be to support the SCP, its completion date will be linked to the completion date for the SCP. After revision to meet WMPO comments, the plan will be available for submittal to OCRWM through WMPO.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M120 LEVEL: 1 WBS: 2.1.2.1.S RESP: SNL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	30 May 85	HQ PLANNED:	30 Jul 85
NVO EXPECTED:	30 Jun 85	HQ EXPECTED:	30 Aug 85
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Yucca Mountain Mined Geologic Disposal System Description (System Requirements)

CRITERIA: The deliverable will be met by submitting a report, SAND84-1882, to WMPO/NV for baselining. The preliminary NNWSI Project System Requirements document submitted to WMPO/NV for project review on September 21 will be revised in response to NNWSI Project and DOE/HQ comments. Review comments should be received during the first half of FY 85 and revisions will be completed by WMPO/NV for baselining. The baselined Yucca Mountain Mined Geologic Disposal System Requirements document will be the official NNWSI statement of the requirements that control site characterization and repository design, operation, and decommissioning.

EVENT: M151 LEVEL: 2 WBS: 2.1.2.1.S RESP: SNL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	21 Sep 84	HQ PLANNED:	
NVO EXPECTED:	30 Nov 84	HQ EXPECTED:	
NVO ACTUAL:	05 Dec 84	HQ ACTUAL:	

DESCRIPTION: Yucca Mountain Mined Geologic Disposal System Description (Preliminary System Requirements)

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report describes the entire repository system as a hierarchy of elements (systems and subsystems). It lists the requirements and constraints imposed on each element, appropriate measures of its performance, and its interactions with other system elements. (See also milestone M120).

EVENT: M165 LEVEL: 2 WBS: 2.1.2.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Aug 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	28 Aug 84	HQ ACTUAL:	

DESCRIPTION: Geologic Model of Yucca Mountain

CRITERIA: The purpose of this study is to develop a three-dimensional model of the geology of Yucca Mountain in a form suitable to provide consistent and easily accessible input data for computer modeling and design calculations. The milestone will be met by submitting to WMPO/NV for policy review a draft

copy of an EA reference, SAND83-2593, "A Three-Dimensional Geologic Model of Yucca Mountain, Southern Nevada."

EVENT: M169 LEVEL: 2 WBS: 2.1.2.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jan 85	HQ ACTUAL:	

DESCRIPTION: Report on the Hydraulic Conductivity of Saturated Intervals in Drill Hole USW H-1 (SAND84-0637)

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. The report will describe calculations of hydraulic conductivity and storativity for each drawdown and recovery test performed in drillhole USW H-1. The results, in conjunction with similar determinations made by the USGS, will be used to help determine the uncertainty in hydrologic parameters of the saturated zone at Yucca Mountain.

EVENT: M166 LEVEL: 2 WBS: 2.1.2.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jul 84	HQ ACTUAL:	

DESCRIPTION: Report on the effect of Host-Rock Dissolution and Precipitation on Permeability

CRITERIA: This deliverable will be met by submitting a draft SAND report to WMPO/NV for policy review. This report will contain the results of a study conducted to determine whether thermally-induced host-rock mineral dissolution and precipitation processes could decrease the isolation capability of a hypothetical repository at Yucca Mountain by significantly altering the permeability of the tuff formations. Conservative assumptions will be used to allow upper bounds on potential permeability changes to be determined. This report is a reference in the Environmental Assessment.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M167 LEVEL: 2 WBS: 2.1.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	29 Mar 85	HQ EXPECTED:	
NVO ACTUAL:	14 Mar 85	HQ ACTUAL:	

DESCRIPTION: Report on the Effect of Water Flow Rate on Spent-Fuel Dissolution

CRITERIA: This deliverable will be met by submitting a draft SAND report to WMPO/NV for policy review. This report will contain the results of a study conducted to determine the effect of water flux on the rate of spent-fuel dissolution in a hypothetical repository at Yucca Mountain. The study represents Sandia's initial effort to develop the source terms needed in the site subsystem performance analysis and the system performance assessment. An important part of this effort will be an analysis to identify potential water contact times in the expected partially-saturated environment.

EVENT: M196 LEVEL: 2 WBS: 2.1.2.2.S RESP: SNL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Retrieval Program Plan

CRITERIA: This plan outlines the NNWSI Project interpretation of retrieval requirements and presents a plan to demonstrate compliance. The deliverable is a report, SAND84-2242, "NNWSI Project Retrieval Program Plan," to WMPO/NV for policy review.

EVENT: M112 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:	30 Aug 84	HQ EXPECTED:	
NVO ACTUAL:	06 Sep 84	HQ ACTUAL:	

DESCRIPTION: Publish Manual on Radionuclide Transport Code FEMTRAN

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV for policy review. The FEMTRAN User's Manual will be a SAND report giving the mathematical formulation of transport problem that it solves, the numerical solution, user's instructions, and example problems. The code FEMTRAN has been developed to simulate transport of a chain of radionuclides through a two-dimensional saturated or unsaturated porous medium. The basis of FEMTRAN is the transport code, FEMWASTE, which was developed

by Duguid and Reeves and subsequently modified by Yeh and Ward at Oak Ridge National Laboratory. The code has been modified further and renamed for use by NNWSI Project performance assessment.

EVENT: M113 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	21 Mar 85	HQ ACTUAL:	

DESCRIPTION: Complete COVE Benchmarking of SAQUARO, TRACR3D, WAFE, FEMTRAN, TRUST

CRITERIA: This deliverable will be met by submitting a draft SAND report to WMPO/NV for policy review. The codes, SAQUARO, TRACR3D, WAFE, FEMTRAN, and TRUST are expected to be used to predict water movement and radioactive mass transport through and from Yucca Mountain under a variety of scenarios. Therefore, benchmarking, as required in NUREG-0856, has been initiated via the COVE (COde VErification) activity. The COVE-1 activity will be completed when the codes all have been used independently to generate results for the same two-dimensional, transient flow and transport problem in homogeneous, porous media. Results will be used to determine relative capabilities of the codes, numerical sensitivities of the codes when problems using data from Yucca Mountain are being run, and effects, if any, of different physical models.

EVENT: M115 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	21 Dec 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Dec 84	HQ ACTUAL:	

DESCRIPTION: Letter Report on Concepts for Transport of Radionuclides in Unsaturated, Fractured Tuff

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV that identifies concepts for describing the transport on a macroscopic scale in the fractured units. The concepts will be illustrated by numerical calculations. Equivalent representations of the water flow through fractured units in YM are to be developed (M103) that describe the flow field either as a single, porous medium with an "effective permiability" or as two overlapping porous media: one having a permeability corresponding to the matrix and the other having a permeability corresponding to flow in the fracture (dual porosity). However, the xport of RN cannot be handled in exactly the same manner. Whereas the same equations may be used to describe water flow in both the rock matrix and the fracs, the governing equations for retardation mechanism in a frac are different from those in the matrix because they include diffusion from the fracture surface into the matrix , and possibly include chem kinetics.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M170 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	29 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Feb 84	HQ ACTUAL:	

DESCRIPTION: Attributes and Associated Favorability Graphs for the NNWSI Area-to-Location Screening Activity

CRITERIA: Done as an EA reference.

EVENT: M171 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	30 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Mar 84	HQ ACTUAL:	

DESCRIPTION: Software for Application Graphics System Support of the NNWSI Area-to-Location Screening Activity

CRITERIA: Added deliverable for EA reference.

EVENT: N114 LEVEL: 2 WBS: 2.1.2.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Feb 85	HQ ACTUAL:	

DESCRIPTION: Construction Project Data Sheet (Schedule 44)

CRITERIA: The Construction Project Data Sheet Document, issued yearly, provides information regarding details of the cost estimate for Title I and II engineering design of geologic nuclear waste repository in tuff. In addition, the document contains information regarding financial schedule and narrative explanation of total project funding. Data sheet submitted to WMPO/NV for review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M132 LEVEL: 2 WBS: 2.1.3.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	05 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Quarterly Report on Tuff Data Base

CRITERIA: The deliverable will be met by submitting an update to the tuff data base document to WMPO/NV. It will also be distributed to designated project personnel. The update will contain information about the tuff and graphical data bases: 1) procedures for interactivity with the data-base managers, 2) microfiche copy of information from the tuff data base and 3) examples of plots from the graphical data base.

EVENT: M177 LEVEL: 2 WBS: 2.1.3.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Update of the User's Manual for the Tuff Data Base Interface

CRITERIA: The deliverable will be met by submitting a report, SAND85-0006, "Update of the Users Manual for the Tuff Data Base Interface," to WMPO/NV for policy review. The report will document the software enhancements to the Tuff Data Base Interface as they will appear to the user. One of the enhancements described will be plotting of information from the data base.

EVENT: N101 LEVEL: 2 WBS: 2.1.3.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	05 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Feb 85	HQ ACTUAL:	

DESCRIPTION: Quarterly Report on Tuff Data Base

CRITERIA: The deliverable will be met by submitting an update to the tuff data base document to WMPO/NV. It will also be distributed to designated project personnel. The update will contain information about the tuff and graphical data bases: 1) procedures for interactivity with the data-base managers, 2) microfiche copy of information from the tuff data base, and 3) examples of plots from the graphical data base.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: N102 LEVEL: 2 WBS: 2.1.3.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	06 May 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	10 May 85	HQ ACTUAL:	

DESCRIPTION: Quarterly Report on Tuff Data Base

CRITERIA: The deliverable will be met by submitting an update to the tuff data base document to WMPO/NV. It will also be distributed to designated project personnel. The update will contain information about personnel. The update will contain information about the tuff and graphical data bases: 1) procedures for the tuff and graphical data-base managers, 2) microfiche copy of information from the tuff data base, and 3) examples of plots from the graphical data base.

EVENT: M028 LEVEL: 2 WBS: 2.1.3.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Transition of Graphics Data Base to Graphics Interactive Information System

CRITERIA: The successful transition of the graphics data from the old Applicon Graphis System to the new GE Calma Interactive Graphics Information System (IGIS) is defined by the following conditions: (1) the transfer of all graphics modeling capabilities to the IGIS, (2) the transfer of all current data to the IGIS data and (3) the capability to incorporate into the IGIS data any background and historical data from present Applicon archive tapes. A letter report describing the success of this transition will be submitted to WMPO/NV.

EVENT: M172 LEVEL: 2 WBS: 2.1.3.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Jun 84	HQ ACTUAL:	

DESCRIPTION: Unit Evaluation at Yucca Mountain, Nevada Test Site. Summary Report and Recommendations

CRITERIA: Added reference for EA.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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04 June 85

EVENT: M001 LEVEL: 2 WBS: 2.1.4.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	01 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: A Three-Dimensional Model of Thermal-Mechanical Units at Yucca Mountain

CRITERIA: This deliverable will be met by submitting report, SAND84-1076, to WMPO/NV for review. The report will document input data, assess the resulting model and discuss its uses.

EVENT: M173 LEVEL: 2 WBS: 2.1.4.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Nov 84	HQ ACTUAL:	

DESCRIPTION: Preliminary Upper-Bound Consequence Analysis for a Waste Repository at Yucca Mountain, Nevada

CRITERIA: Added as EA reference. (See report SAND84-1492)

EVENT: M174 LEVEL: 2 WBS: 2.1.4.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	21 Dec 84	HQ ACTUAL:	

DESCRIPTION: Preliminary Two-Dimensional Regional Hydrologic Model of the Nevada Test Site and Vicinity EA

CRITERIA: SAND83-7466, "Preliminary Two-Dimensional Regional Hydrologic Model of the Nevada Test Site and Vicinity."

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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04 June 85

EVENT: M107 LEVEL: 2 WBS: 2.1.4.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: NNWSI Project Position Paper Describing Engineered Barrier System and Disturbed Zone Boundaries

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV. The letter report will describe the EBS and DZ, the regulatory criteria associated with each, and the technical issues involved in defining the boundries. The analyses of the two regions will be summarized and boundary locations will be recommended.

EVENT: M111 LEVEL: 2 WBS: 2.1.4.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Mar 86	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft Report on the Effect of Heat and Excavation on Water Flow in the Vicinity of the Waste Package

CRITERIA: The deliverable will be met by submitting a report, SAND85-0005, "The Effect of Heat and Excavation on Water Flow in the Vicinity of a Waste Package Emplaced in the Unsaturated Zone at Yucca Mountain," to WMPO/NV for policy review. The report will contain the results of several analyses in which the effects of waste heat and repository construction on permeability, temperature distribution, water saturation, and water-flow mechanisms in the repository region around the waste package are investigated. As such, the results of both the LBL two-phase flow study, and if applicable, the RE/SPEC thermechanical studies of joint aperture changes, will be included.

EVENT: M114 LEVEL: 2 WBS: 2.1.4.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Dec 84	HQ PLANNED:	
NVO EXPECTED:	30 Apr 85	HQ EXPECTED:	
NVO ACTUAL:	20 May 85	HQ ACTUAL:	

DESCRIPTION: PA Code for Nonisothermal Water and Air Transport

CRITERIA: The deliverable will be met by submitting a report, SAND84-2057, 'NORIA - A Finite Element Computer Program for Analyzing Water/Vapor/Energy Transport in Porous Media," to NVO/WMPO for policy review. The report will include the mathematical formulation of the equations in NORIA, the numerical

solution, users instructions, and example problems. Predictions of behavior in the near field require a computer code that simulates water movement through unsaturated geologic media in the presence of a transient-heat flux that is sufficient to cause vapor generation. Both amenable forms of the governing equations and the equations-of-state have been developed. The code NORIA has been developed and implemented to solve these equations. The basis for the code NORIA is the nonisothermal hydrology code, SAGUARO. (The NORIA code models water vapor transport; whereas SAGUARO only models water movement in the liquid phase)

EVENT: M131 LEVEL: 2 WBS: 2.1.4.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	14 Dec 84	HQ PLANNED:	
NVO EXPECTED:	15 Jan 85	HQ EXPECTED:	
NVO ACTUAL:	07 Jan 85	HQ ACTUAL:	

DESCRIPTION: Definition of a Vapor Transport Benchmarking Problem (Description of a Common Near-Field Hydrothermal Problem and Necessary Input Parameters)

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV for policy review. The nonisothermal hydrologic computer codes used by the Performance Assessment and Waste Package Design groups to calculate the moisture and temperature distributions in the waste package and in the host rock surrounding the waste package must be verified and validated in accordance with NUREG-0856. A common benchmarking problem will be defined that will be solved by LLNL using the WAFE code, by SNLA using the NORIA code, and by LBL under contract to SNLA using the TOUGH code. The problem will be defined so that the results can be used to support ongoing analyses at the two labs to satisfy related milestones.

EVENT: M142 LEVEL: 2 WBS: 2.1.4.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: SNL Modifications to the TRACR3D Code

CRITERIA: The deliverable will be met by submitting a report, SAND85-0008, "Sandia Modifications to TRACR3D Flow and Transport Code," to WMPO/NV for policy review. The TRAC3D code is operational at SNLA and is a potential tool for Performance-Assessment calculations. Modifications to the LANL version had to be made to account for system differences. The report will document the SNL version of the code used by Performance Assessment and will describe any changes made to the code, PA procedures, and any additional subroutines or capabilities which may be used.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: P138 LEVEL: 2 WBS: 2.1.4.3.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: SAND Report on SPARTAN

CRITERIA: This deliverable will be met by submitting a report to WMPO/NV, SAND85-0602, "SPARTAN: A Simple Performance Assessment Code for the NNWSI Project." This code calculates radionuclide transport in geologic media. The physical processes considered are Darcy flow, linear chain of radionuclide decay, and convertive transport with constant retardation. The report presents discriptions of the computer-model simulation of flow, decay, transport and cummulative curies released. Two test problems are illustrated to demonstrate the results of simulation. The results of SPARTAN are compared with analytical solutions. The comparisons show that the SPARTAN solutions very closely match the analytical solutions across a range of conditions that approximate those that might occur at Yucca Mountain.

EVENT: M102 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	05 May 85	HQ PLANNED:	
NVO EXPECTED:	30 Aug 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Documentation of the Total Systems Performance Assessment Code (TOSPAC). Volume 1: Physical and Mathematical Basis

CRITERIA: This milestone will be met by submitting a report, SAND85-0002, "Total-Systems Performance-Assessment Code (TOSPAC) Volume 1: Physical and Mathematical Bases," to WMPO/NV for policy review. The report will be the first in a series providing documentation of TOSPAC. In Volume 1 of the series, the physical and mathematical bases for the source-term, hydrodynamics and radionuclide transport modules of TOSPAC will be described. After revision to meet WMPO/NV comments, the draft report will be published as an SNL report.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M104 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Letter Report on Preliminary Selection of Disruptive Scenarios

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV. The contents of the report will include: (1) methods used to identify disruptive events and processes at Yucca Mountain; (2) thescreening of potentially significant events and processes, leading to (3) a preliminary selection of the events and processes that warrant further, detailed analyses and calculations. After revision to meet WMPO comments, the letter report may be published as an SNL report. (See report SAND85-0010)

EVENT: M106 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Apr 85	HQ PLANNED:	
NVO EXPECTED:	30 Jul 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: PA Input to Final EA

CRITERIA: The deliverable will be met by submitting material for inclusion in the final environmental assessment (EA). The revision of the EA will probably require revisions of the sections prepared by performance-assessment personnel; the newly written sections will be submitted to WMPO/NV by the completion date shown or on a date to be determined as DOE/HQ revises the schedule for preparing the final EA.

EVENT: M126 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: SAND Report on NNWSI Project Data Priority Study

CRITERIA: This milestone will be met by submitting a report, SAND85-0003, "Priorities on Types of Data Needed to Assess the Postclosure Performance of a Nuclear Waste Disposal System Located at Yucca Mountain, Nye County Nevada," that is a follow-up milestone 138. It will contain details of the study

providing justification Performance assessment at SNL will conduct the study which will prioritize the data needed to assess the long-term isolation and containment capability of the Yucca Mountain site. Parameters will be prioritized with respect to their significance in the equations and models governing the containment and release of radionuclides from the engineered-barrier system and the environment. Whenever possible, the range of data values that are of significance will be identified, and the required precision of their measurement will be discussed. The results of the study are to be used in Chapter 8 of the SCP and in Chapter 5 of the ESTP. The report will be sent to WMPO/NV for policy review.

EVENT: M128 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	08 Feb 86	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Documentation of the Total, Systems Performance Assessment Code (TOSPAC). Volume 2: User's Manual and Sample Problems

CRITERIA: This milestone will be met by submitting a report, SAND85-0004, "Documentation of the NNWSI Project Total System Performance-Assessment Code (TOSPAC) Volume 2: User Manual and Sample Problems," to WMPO/NV for policy review. The report will be second in a series providing documentation of TOSPAC. In Volume II of the series, the modular structure of the code will be described and instructions for use of the code on a VAX 11/780 computer will be provided, along with a set of sample problems that will test the user's knowledge of the instructions and the compatibility of the code with user's equipment.

EVENT: M138 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	01 Mar 85	HQ PLANNED:	
NVO EXPECTED:	30 Sep 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Letter Report on NNWSI Project Data Priority Study

CRITERIA: The deliverable will be met by submitting a letter report in support of the SCP to WMPO/NV for review. This letter report will contain prioritization of data needs according to levels of significance in postclosure performance assessments with supporting justification.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M144 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 May 85	HQ PLANNED:	
NVO EXPECTED:	30 Sep 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Sensitivity Analysis of the Unsaturated Zone Hydrology of Yucca Mountain

CRITERIA: The deliverable will be met by submitting a report, SAND84-7212, "Investigations of Uncertainty and Sensitivity of Some Hydrologic Models of Yucca Mountain and Vicinity," to WMPO/NV for policy review. The report will describe and interpret calculations which investigate the response of pressure, moisture content, travel time, etc. to input parameters such as flux, rock properties, and position in rock units.

EVENT: M175 LEVEL: 2 WBS: 2.1.4.4.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	21 Nov 84	HQ ACTUAL:	

DESCRIPTION: Fracture and Matrix Hydrologic Characteristics of Tuffaceous Materials from Yucca Mountain, Nye County, Nevada

CRITERIA: SAND84-1471, "Fracture and Matrix Hydrologic Characteristics of Tuffaceous Materials from Yucca Mountain, Nye County, Nevada."

EVENT: M205 LEVEL: 2 WBS: 2.2.1.L RESP: LLNL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:	28 Sep 84	HQ EXPECTED:	
NVO ACTUAL:	24 Aug 84	HQ ACTUAL:	

DESCRIPTION: Report on Static Hydrothermal Alteration Studies of Topopah Spring Tuff Core Wafers in J-13 Water at 150 degrees C

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report documents the results of all the static hydrothermal experimentation using Topopah Spring Tuff core wafers. This information is needed both to provide a description of the post-emplacement conditions in the repository and to provide guidance to the materials testing and modeling programs.

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EVENT: M219 LEVEL: 2 WBS: 2.2.2.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	01 Oct 84	HQ ACTUAL:	

DESCRIPTION: Report on Revised Unsaturated Test Procedure with Results from Preliminary Testing

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report will document the test method which will be used to simulate expected repository conditions for reprocessed waste from testing. The report and test results are needed as part of the process for development and validation of test procedures to determine the release rate of radionuclides under anticipated repository conditions.

EVENT: M229 LEVEL: 2 WBS: 2.2.2.2.L RESP: LLNL STATUS: B WMPO RESP:

NVO PLANNED:	30 Nov 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Nov 83	HQ ACTUAL:	

DESCRIPTION: Report on the Preliminary Selection of Candidate Metals for Corrosion Survey Tests

CRITERIA: This deliverable will be met by submitting a draft report to the WMPO/NV. This report details the criteria used to select the candidate metals to be tested for use as canister materials in high-level nuclear waste containment in a tuff repository. An outline of the overall materials test program planned for these metals will be presented.

EVENT: M239 LEVEL: 2 WBS: 2.2.2.3.L RESP: LLNL STATUS: B WMPO RESP:

NVO PLANNED:	06 Apr 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Apr 84	HQ ACTUAL:	

DESCRIPTION: Report on Reference Waste Forms and Packing Materials for the NNWSI Project

CRITERIA: This deliverable will be met by submitting a draft report to the WMPO/NV. This report is needed to document the reference waste forms and packing materials for the NNWSI Project repository design, materials testing, and performance assessment calculations.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M206 LEVEL: 2 WBS: 2.2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	01 Apr 85	HQ ACTUAL:	

DESCRIPTION: Report on the Reaction of Topopah Spring Tuff Drill Cores USW G-1, USW GU-3, USW G-4, and UE-25h#1 with J-13 Water at 150 degrees C

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report will provide information on the expected degree of chemical variation in the water that will enter the waste package environment. This information is needed to provide an adequate description of the post-emplacement environment of waste packages and to define the expected range of chemical conditions to which the waste packages will be exposed.

EVENT: M213 LEVEL: 2 WBS: 2.2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on Stability Analysis of Borehole Openings in the Topopah Spring Tuff

CRITERIA: This deliverable will be met by submission of a draft report to the WMPO/NV. This work is needed in order to provide guidance for waste package design and materials testing since instability can affect canister retrievability and integrity in both short and long term time frames.

EVENT: M217 LEVEL: 2 WBS: 2.2.3.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	31 Oct 84	HQ PLANNED:	
NVO EXPECTED:	30 Nov 84	HQ EXPECTED:	
NVO ACTUAL:	07 Nov 84	HQ ACTUAL:	

DESCRIPTION: Report of Test Results from Simulated and Fully Active DHLW Glass in J-13 Water and Tuff Reaction Vessels

CRITERIA: This deliverable will be met by sumbitting a draft report to WMPO/NV. This report will provide an upper limit estimate on the release rate of radionuclides from DHLW in the tuff repository environment.

EVENT: M225 LEVEL: 2 WBS: 2.2.3.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED: 30 Aug 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Report on Test Results for Glass Waste Forms Using an Unsaturated Test Method

CRITERIA: This deliverable will be met by submission of a draft report to the WMPO/NV. This report will provide information on the release rate of radionuclides from glass waste forms under unsaturated conditions. This information is needed to support the Level 1 deliverable milestone M255.

EVENT: M234 LEVEL: 2 WBS: 2.2.3.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED: 31 Dec 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Letter Report on Desireable Modifications to DOE/Utility Contracts for Spent Fuel Regarding Fuel Data

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV outlining and justifying suggested changes to the data utilities are to provide on characteristics and condition of spent fuel to be transferred to DOE for disposal.

EVENT: M250 LEVEL: 1 WBS: 2.2.3.1.L RESP: WMPO STATUS: B WMPO RESP: Valentine

NVO PLANNED: 30 Jul 84 HQ PLANNED: 30 Aug 84
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: 23 Aug 84 HQ ACTUAL: 12 Apr 85

DESCRIPTION: Establish Interim Product Specifications

CRITERIA: This deliverable will be met by submission of a draft report to the WMPO/NV. This document is needed to provide guidance for waste package design, materials testing and performance assessment calculations for NNWSI. In addition, it is needed to provide guidance to reprocessed waste producers as to requirements for testing and documentation of waste forms in order to be acceptable by the repository for disposal. This report will be issued in the informal UCID 20000 series format. Full internal, external and NNWSI Project distribution is presently planned.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
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EVENT: M202 LEVEL: 2 WBS: 2.2.3.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	27 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	27 Jul 84	HQ ACTUAL:	

DESCRIPTION: Copper Test Plan for FY85/FY86

CRITERIA: This deliverable will be met by submission of a draft testing plan to WMPO/NV. The test plan will include plans for testing copper and copper-base alloys as waste package container materials. This plan was developed at the request of WMPO/NV.

EVENT: M203 LEVEL: 2 WBS: 2.2.3.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	10 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	10 Feb 84	HQ ACTUAL:	

DESCRIPTION: Corrosion Concerns with Cu and Cu-based Alloys for Nuclear Waste Containers in NNWSI

CRITERIA: This deliverable will be met by delivery of a letter document to M. Frei, DOE/HQ. This report was required due to headquarters request for information on this subject.

EVENT: M222 LEVEL: 1 WBS: 2.2.3.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	28 Jun 85	HQ PLANNED:	01 Aug 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Input to DOE/HQ Report to Congress on Copper for Waste Packages

CRITERIA: This deliverable will be met by submission, through WMPO/NV, to DOE/HQ of input from the NNWSI Project to the report to Congress. This input will summarize the investigations of both technical and non-technical considerations affecting the potential for utilizing copper and copper-based alloys as waste package canister material. The input will discuss work undertaken in FY 85 and planned for FY 86, and document the basis for recommendations.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M235 LEVEL: 2 WBS: 2.2.3.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	31 May 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on the Results of Testing Conceptual Design Metal Barrier Materials Under Relevant Environmental Conditions for a Tuff Repository

CRITERIA: This deliverable will be met with submission of a draft report to the WMPO/NV. The report will document a selection of candidate materials to be used for the prototype design of a waste package canister. This selection will be based on all the results to date from metallurgical experiments. In addition, a plan will be described for continuing corrosion studies based on all the results to date from metallurgical experiments. In addition, a plan will be described for continuing corrosion studies based on the results available.

EVENT: M240 LEVEL: 2 WBS: 2.2.3.3.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	30 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Jan 85	HQ ACTUAL:	

DESCRIPTION: Final Report on Permeability of Topopah Spring Tuff in a Temperature Gradient

CRITERIA: This deliverable will be met by submission of a draft report to the WMPO/NV. This report will document the results of experimental studies to determine the permeability of packing materials in a waste package design. This information is needed to understand the flow path and flow rate of waste in the very-near-field environment.

EVENT: M231 LEVEL: 1 WBS: 2.2.4.L RESP: WMPO STATUS: B WMPO RESP: Valentine

NVO PLANNED:	15 Mar 85	HQ PLANNED:	29 Mar 85
NVO EXPECTED:	31 May 85	HQ EXPECTED:	15 Jun 85
NVO ACTUAL:	31 May 85	HQ ACTUAL:	

DESCRIPTION: Complete Waste Package Conceptual Design Criteria

CRITERIA: This deliverable will be met by submission of detailed advanced conceptual design criteria to WMPO/NV. Advanced conceptual design will begin after DOE/HQ submittal.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M233 LEVEL: 1 WBS: 2.2.4.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	30 Apr 85	HQ PLANNED:	30 Apr 85
NVO EXPECTED:	30 Jun 85	HQ EXPECTED:	30 Jun 85
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Initiate Waste Package Advanced Conceptual Design

CRITERIA: After the waste package advanced conceptual design criteria is approved by DOE/HQ (milestone M231), the waste package advanced conceptual design activity will be initiated. This activity will involve development of conceptual designs which will be used for fabrication of the waste package prototype. Milestone completion will be documented in a letter to WMPO/NV.

EVENT: M251 LEVEL: 1 WBS: 2.2.4.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	30 Aug 84	HQ PLANNED:	28 Sep 84
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	25 Sep 84	HQ ACTUAL:	20 Dec 84

DESCRIPTION: Pre-Closure Analysis of Selected Conceptual Designs

CRITERIA: This deliverable will be met by submission of a draft report to the WMPO/NV. This report will document the basis for the selection of the conceptual package reference designs and alternatives, the basis for discarding the concepts which are not being developed and detailing the analysis which support the conceptual designs compared to the preclosure design requirements. This report is not a long term performance analysis.

EVENT: M200 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	04 Oct 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	04 Oct 83	HQ ACTUAL:	

DESCRIPTION: NRC Geology Workshop

CRITERIA: This deliverable will be met by preparing information for review and conducting a presentation with the NRC. This deliverable was requested by DOE/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: M204 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	21 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	21 May 84	HQ ACTUAL:	

DESCRIPTION: Program Research and Development Assessment Evaluation

CRITERIA: LLNL Waste Package program was requested to participate as a panel member on the Program Research and Development Assessment Evaluation Panel per directive from Headquarters. This deliverable will be met by preparing information for review and conducting an information review for the Panel.

EVENT: M207 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	13 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Jul 84	HQ ACTUAL:	

DESCRIPTION: Radionuclide Source Term for NNWSI Performance Assessment

CRITERIA: This deliverable will be met by preparing information for review and conducting a program review at PANRG meeting in Gaithersburg. Participation at this meeting was requested by DOE/HQ.

EVENT: M209 LEVEL: 1 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	24 Aug 84	HQ PLANNED:	24 Aug 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Sep 84	HQ ACTUAL:	13 Sep 84

DESCRIPTION: Waste Package Coordination Group

CRITERIA: This deliverable will be met by preparation of information and conducting 4-1/2 hours of presentation for review. This was a DOE/HQ directive to participate in this meeting. The meeting was held in Germantown on September 11-13, 1984.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
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EVENT: M210 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	18 Sep 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	03 Oct 84	HQ ACTUAL:	

DESCRIPTION: Generic Glass Waste Acceptance Requirements

CRITERIA: This deliverable will be met by preparing information for review and presenting data at the Generic Glass Waste Acceptance Requirements workshop in Denver, CO, on October 2-3, 1984. This was a DOE/HQ directive.

EVENT: M211 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	21 Oct 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	21 Oct 83	HQ ACTUAL:	

DESCRIPTION: NNWSI Waste Package Activities

CRITERIA: This deliverable will be met by delivery of a letter report to WMPO/NV. This report was generated for submission to Mark Frei, DOE/Hqts in response to a request for information from Congressman M. K. Udall. This report describes the design, concepts and materials under consideration for waste form and packing materials. It also discusses the advantages and disadvantages of the materials for use in a tuff repository.

EVENT: M214 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	28 Oct 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	28 Oct 83	HQ ACTUAL:	

DESCRIPTION: NRC Draft Technical Position Paper-Review Comments

CRITERIA: Deliverable will be met with a letter report to WMPO/NV.This reportconsisted of technical review comments on the NRC technical position paper on waste package reliability. Review was done at the request of WMPO/NV.

EVENT: M215 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	28 Oct 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	28 Oct 83	HQ ACTUAL:	

DESCRIPTION: MIO Functions and Evaluations

CRITERIA: This deliverable will be met by delivery of a letter report to WMPO/NV. This report is a technical evaluation of MIO functions and operations. Evaluation was performed at the request of WMPO/NV.

EVENT: M216 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	02 Dec 83	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	02 Dec 83	HQ ACTUAL:	

DESCRIPTION: NRC Technical Position in Geology/Tectonics-Review Comments

CRITERIA: This deliverable will be met with submission of a letter report to WMPO-NV. This report consisted of technical review comments on theNRC draft technical position paper on geology/tectonics. This review was done at the request of WMPO-NV.

EVENT: M218 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	09 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	09 Mar 84	HQ ACTUAL:	

DESCRIPTION: Review Comments on 10-CFR-960

CRITERIA: This deliverable will be met by submission of a lette report to WMPO/NV. This report contains review comments and suggested revisionsto 10-CFR-960. This review was requested by WMPO/NV.

EVENT: M220 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	03 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	03 Feb 84	HQ ACTUAL:	

DESCRIPTION: Review Comments on Generic Licensing Issues

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV. This report contains technical review comments no the generic licensing issues. This review was requested by WMPO/NV.

EVENT: M221 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	15 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jun 84	HQ ACTUAL:	

DESCRIPTION: Generic Waste Acceptance Requirements for DWPF and West Valley-review Comments

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV. This report contains technica review comments on generic waste acceptance requirements. Review was requested by WMPO/NV.

EVENT: M223 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Jun 84	HQ ACTUAL:	

DESCRIPTION: DOE/Utilities Contract-Review Comments

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV. This reprot contains technical review comments on the provisions of the DOE/Utilities contract spent fuel characteristics. Review was requested by WMPO/NV.

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EVENT: M224 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	20 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	20 Jul 84	HQ ACTUAL:	

DESCRIPTION: Generic Requirements for a Mined Geologic Disposal System-Relew Comments

CRITERIA: This deliverable will be met by submission of a letter report to Sandia National Laboratory and WMPO/NV. This report contains extensive technical review comments and involved the time of several scientists. Review was requested by WMPO/NV and SNL.

EVENT: M227 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	14 Sep 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	14 Sep 84	HQ ACTUAL:	

DESCRIPTION: Commercial Spent Fuel as a High Level Waste Form-Technical Review

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV. This report contains extensive technical review comments onPNL report #PNL-5093. Review of this document was requested by WMPO/NV.

EVENT: M228 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	13 Jan 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Jan 84	HQ ACTUAL:	

DESCRIPTION: Draft Technical Position Subtask 1.1: Waste Package Performance after Repository Closure-Review Comments

CRITERIA: This deliverable will be met by submission of a letter report to WMPO/NV. This report consisted of review comments on the NRC technical position paper on the waste package performance after repositoryclosure. This review was prepared at the request of WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M230 LEVEL: 2 WBS: 2.2.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	08 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	08 Feb 84	HQ ACTUAL:	

DESCRIPTION: Technical Evaluation of Borosolicate Glass as a High-level Waste Form

CRITERIA: This deliverable will be met by delivery of a letter document to WMPO/NV. This report is a technical review on the use of borosilicate glass as a high-level waste form and was requested by WMPO/NV.

EVENT: M300 LEVEL: 2 WBS: 2.3.1.1.A RESP: LANL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jul 84	HQ ACTUAL:	

DESCRIPTION: Issue a Report on Geochemical Calculations Relating Groundwater Chemistry and Mineral Formations in Tuff of Southwest Nevada

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize geochemical calculations relating groundwater chemistry and mineral formation in tuffs of southwest Nevada.

EVENT: M322 LEVEL: 2 WBS: 2.3.1.7.A RESP: LANL STATUS: B WMPO RESP:

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Jun 84	HQ ACTUAL:	

DESCRIPTION: Publish Documentation for TRACR3D and WAFE Codes

CRITERIA: Documentation for TRACR3D and WAFE will be published by LANL. The documentation will describe the codes, the equations of the models, the numerical solution procedures, model verifications and validations, and will provide user's guides.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M326 LEVEL: 2 WBS: 2.3.1.8.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Jun 86	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue the Final Test Plan for Diffusion Experiments in the Exploratory Shaft

CRITERIA: A final test plan will be submitted to WMPO/NV. The test plan will detail experiments in the ES that will correlate laboratory and calculational data with in situ tests.

EVENT: M361 LEVEL: 2 WBS: 2.3.2.1.1.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Nov 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	16 Nov 84	HQ ACTUAL:	

DESCRIPTION: Geological Studies at Yucca Mountain for the NNWSI Project

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report is a revision of Chapter 3 of the SCP and describes the geology of Yucca Mountain and its vicinity. It will include discussions of both descriptions and processes of regional and site geomorphology, geologic structure, and stratigraphy. After revision to meet USGS Headquarters and WMPO comments, the report will be approved for publication as a USGS open-file release by August 1.

EVENT: N448 LEVEL: 2 WBS: 2.3.2.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Preliminary Validation of Subsurface Conditions for Repository Surface Facilities

CRITERIA: Exploratory borenoles and geophysics will confirm suitability of site east of Exile Hill for placement of waste handling facilities, especially concerning seismic properties. This milestone will be met by submitting a SAND report to WMPO/NV for policy review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M357 LEVEL: 1 WBS: 2.3.2.2.4.S RESP: WMPO STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	14 Dec 84	HQ PLANNED:	15 Jan 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Feb 85	HQ ACTUAL:	

DESCRIPTION: Weapons Test Seismic Report

CRITERIA: The deliverable will be met by submitting a report, SAND84-2296, "Ground Motion at Yucca Mountain From Underground Nuclear Explosion at Pahute Mesa (U)" to WMPO/NV. The report will be a summary of the weapons test seismic data through FY84 and will provide the interpretation or the data necessary to support the conceptual design. After revision to meet WMPO comments, the report will be available for submittal to OCRWM through WMPO.

EVENT: M329 LEVEL: 2 WBS: 2.3.2.A RESP: LANL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:	31 Aug 84	HQ EXPECTED:	
NVO ACTUAL:	31 Aug 84	HQ ACTUAL:	

DESCRIPTION: Issue a Report on Eh Buffering Potential of Fe and Ti-oxide minerals at Yucca Mountain

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize findings on the Eh buffering potential of Fe and Ti-oxide minerals at Yucca Mountain.

EVENT: M330 LEVEL: 2 WBS: 2.3.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	05 Sep 84	HQ ACTUAL:	

DESCRIPTION: Issue a Report on Mineralogic Variability within the Topopah Spring Unit

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize the mineralogic variability in the Topopah Spring Unit.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M355 LEVEL: 1 WBS: 2.3.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Jul 84	HQ PLANNED:	31 Aug 84
NVO EXPECTED:		HQ EXPECTED:	31 Oct 84
NVO ACTUAL:	18 Sep 84	HQ ACTUAL:	10 Oct 84

DESCRIPTION: Progress Report on 3-Dimensional Mineralogic Model of Yucca Mountain

CRITERIA: A draft report will be submitted to the WMPO/NV. This work will summarize findings to date on the three-dimensional mineralogical model of Yucca Mountain.

EVENT: M394 LEVEL: 2 WBS: 2.3.3.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Nov 84	HQ ACTUAL:	

DESCRIPTION: Two-dimensional Groundwater Flow Model of Yucca Mountain and Vicinity, Nevada

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report summarizes the two-dimensional simulation of the groundwater flow within Yucca Mountain and its surrounding area. It will include simulations in flow and recharge. After revision to meet USGS Headquarters and WMPO comments, the reports will be approved for publication as a USGS open-file release by August 1. (CCB Secretary's note: See D.L.Vieth ltr dtd 6-Nov-1984. Report title, as released, is "Finite Element Simulation of Ground Water Flow in the Vicinity of Yucca Mountain, Nevada California". Per SAIC/Golden ltr to W.W.Dudley, USGS, not dated, received 5/1/85.)

EVENT: M354 LEVEL: 1 WBS: 2.3.4.1.1.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Jul 84	HQ PLANNED:	30 Aug 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jun 84	HQ ACTUAL:	14 Feb 85

DESCRIPTION: Letter Report on Groundwater Chemistry Along Flow Pat:

CRITERIA: A draft report will be submitted to the WMPO/NV. This work will summarize findings to date on the groundwater chemistry along flow paths away from the repository.

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EVENT: R397 LEVEL: 2 WBS: 2.3.4.1.1.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Field Demonstration Proposal Complete

CRITERIA: A program plan will be prepared and submitted to WMPO/NV for a field test on the well-to-well tracer tests of the overall retardation of waste elements in the saturated zone of Yucca Mountain, including matrix diffusion on particulate transport.

EVENT: M304 LEVEL: 2 WBS: 2.3.4.1.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Letter Report on 36Cl in Shallow Samples

CRITERIA: A letter report will be submitted to the WMPO/NV. The work will summarize findings regarding recent infiltration rates in near surface samples of Yucca Mountain by locating the "bomb pulse of 36Cl."

EVENT: M306 LEVEL: 2 WBS: 2.3.4.1.3.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	17 May 85	HQ ACTUAL:	

DESCRIPTION: Interim Report on Kinetics of Silica Phase Transition in Yucca Mountain

CRITERIA: An draft report will be submitted to WMPO/NV. This work will summarize the kinetics of silica phase transition on Yucca Mountain tuff and the effect of kinetics on the transport of radionuclides.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M308 LEVEL: 2 WBS: 2.3.4.1.4.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Mar 85	HQ ACTUAL:	

DESCRIPTION: Issue a Preliminary Report on the Measured Solubilities of Americium and Plutonium Compounds in Typical Groundwater of Yucca Mountain

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize measured americium and plutonium solubilities.

EVENT: R386 LEVEL: 2 WBS: 2.3.4.1.4.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	26 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on Important Radionuclides for Solubility Measurements

CRITERIA: A report will prepared and submitted to WMPO/NV in which the waste elements requiring solubilty and sorption measurements are defined. This report will include an assessment of the relative importance of the various waste elements with respect to the effect of solubility and sorption on radionuclide transport.

EVENT: M312 LEVEL: 2 WBS: 2.3.4.1.5.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Final Report on Effects on Microbes on Retardation

CRITERIA: A final report will be submitted to WMPO/NV. The report will describe the effects of microbes on retardation.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M313 LEVEL: 2 WBS: 2.3.4.1.5.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Summary Report on Sorption Measurements Using J-13 Water

CRITERIA: This report will give the experimental results of sorption measurements with J-13 water. Particle size effects on the sorption measurements will be discussed. The application of results obtained in water-dominated systems to rock-dominated systems will be addressed by comparing batch, column, and wafer sorption measurements.

EVENT: M317 LEVEL: 2 WBS: 2.3.4.1.6.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Jan 85	HQ PLANNED:	
NVO EXPECTED:	30 May 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue an Assessment Report on the Kinetics of Sorption

CRITERIA: A draft report will be submitted to the WMPO/NV. This work will summarize the kinetics of sorption on Yucca Mountain tuff and the effects of kinetics on the transport of radionuclides.

EVENT: M318 LEVEL: 2 WBS: 2.3.4.1.6.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 May 85	HQ PLANNED:	
NVO EXPECTED:	28 Jun 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue Report on Transport of Radionuclides by Fracture Flow in Yucca Mountain Tuffs Under Saturated Conditions

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize the potential for radionuclide transport by fracture flow in saturated systems.

EVENT: M323 LEVEL: 2 WBS: 2.3.4.1.7.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:	28 Jun 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Letter Report on the Two-Dimensional Geochemistry Simulation of Yucca Mountain

CRITERIA: A letter report will be submitted to the WMPO/NV. The work will present TRACR3D calculations of Yucca Mountain retardation capacity based upon geochemical and hydrological pathway properties using crack distribution and kinetics instead of assuming equilibrium chemistry.

EVENT: M324 LEVEL: 2 WBS: 2.3.4.1.7.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Preliminary Report on Geochemistry Simulation of Yucca Mountain

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize preliminary TRACR3D simulations of Yucca Mountain geochemistry to predict radionuclide travel time and release rates using best available data on mineralogy, water chemistry flow rates and crack statistics.

EVENT: M342 LEVEL: 2 WBS: 2.3.4.1.9.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	30 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Feb 84	HQ ACTUAL:	

DESCRIPTION: Complete Draft "EQ6 User's Manual"

CRITERIA: This deliverable will be met by submitting a draft manual report to the WMPO/NV. The user's manual will satisfy NRC's documentation requirements for computer codes. It will contain a description of the code, examples of input and output files, and example problems. This will be a working manual, in which new capabilities will be documented in supplemental reports.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M343 LEVEL: 2 WBS: 2.3.4.1 9.L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Complete Draft "MCRT User's Manual"

CRITERIA: This deliverable will be met by submitting a draft report to the WMPO/NV. The report will describe MCRT, the data processing routine used in the EQ3/6 code package, and data base files that contain the thermodynamic data and their sources. This report is needed to meet NRC documentation requirements.

EVENT: M208 LEVEL: 2 WBS: 2.3.4.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	13 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Jul 84	HQ ACTUAL:	

DESCRIPTION: EQ3/6 Presentation at the NRC Geochemistry Workshop

CRITERIA: This deliverable will be met by preparing information and presenting a technical talk at the NRC Geochemistry Workshop at Los Alamos. This presentation was prepared at the request of WMPO-NV.

EVENT: M331 LEVEL: 2 WBS: 2.3.4.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Oct 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Draft Report on Statistical Evaluation of Lateral Continuity in Sorptive Mineral Zones

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will sumarize our assessment of sorptive mineral abundances, variability, and continuity along transport pathways.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M332 LEVEL: 2 WBS: 2.3.4.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Summary Report on Mineral Distributions at Yucca Mountain Determined from X-ray Diffraction Data

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize X-ray diffraction experiments on drill core samples to determine mineralogic variability in the repository horizon and along transport pathways.

EVENT: M333 LEVEL: 2 WBS: 2.3.4.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Mar 86	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue a Summary Report on Distribution of Oxidizable Fe and Mn Species in Rocks Along Transport Pathways

CRITERIA: A draft report will be submitted to the WMPO/NV. The work will summarize findings regarding the distribution of oxidizable Fe and Mn species present along transport pathways.

EVENT: M353 LEVEL: 1 WBS: 2.3.5.2.G RESP: USGS STATUS: B WMPO RESP:

NVO PLANNED:	31 May 84	HQ PLANNED:	29 Jun 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Mar 84	HQ ACTUAL:	30 Apr 84

DESCRIPTION: Ground Water Level Data and Preliminary Potentiometric Surface Maps, Yucca Mountain and Vicinity, Nye County NV

CRITERIA: This deliverable was met by submitting a draft report to WMPO/NV. This report describes the configuration and gradient of the water table/potentiometric surface at and in the vicinity of Yucca Mountain. Water level measurements at data points also are listed. After revision to meet USGS headquarters and WMPO comments, the report will be published as USGS open-file release and submitted to OCRWM through WMPO by June 30. (This report replaces the "letter report" originally defined for this milestone.)

EVENT: M362 LEVEL: 2 WBS: 2.3.5.C RESP: USGS STATUS: B WMPO RESP:

NVO PLANNED:	25 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	22 Aug 84	HQ ACTUAL:	

DESCRIPTION: Preliminary Description of Yucca Mountain Vicinity, Nevada-California

CRITERIA: This deliverable will be met by submitting a draft report WMPO/NV. This report is a revision of Chapter 5 of the SCP and describes the hydrology and hydrologic processes in the saturated and unsaturated zones of Yucca Mountain and vicinity. It will include discussions on the occurrence and movement of groundwater, hydraulic characteristics of the aquifers, sources and estimates of recharge, and areas and amounts of groundwater discharge. After revision to meet USGS Headquarters and WMPO comments, the report will be approved for publication as a USGS open-file release by August 1.

EVENT: M348 LEVEL: 2 WBS: 2.3.6.1.A RESP: LANL STATUS: B WMPO RESP:

NVO PLANNED:	30 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	09 May 84	HQ ACTUAL:	

DESCRIPTION: Assess the Impact of Hydrovolcanic Volcanism on the NNWSI Project

CRITERIA: Complete studies to determine the relative hazards of future volcanism at the proposed site based on its histroy. The evaluations will be documented as part of M356.

EVENT: M356 LEVEL: 1 WBS: 2.3.6.1.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	03 Sep 84	HQ PLANNED:	28 Sep 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	18 Dec 84	HQ ACTUAL:	22 Jan 85

DESCRIPTION: Complete Report on Volcanic Hazards Analysis

CRITERIA: A final report will be submitted to WMPO/NV. This work will summarize the history of volcanism in the proposed repository site and the potential importance of future hydrovolcanic activity.

EVENT: M395 LEVEL: 2 WBS: 2.3.6.1.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 01 Mar 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Quaternary History of the Yucca Mountain Area, Nye County, Nevada

CRITERIA: This deliverable will be met by submitting a draft report to WMPO/NV. This report describes the Quaternary geology and geologic processes at Yucca Mountain and vicinity, and interprets the Quaternary geologic history of the area. After revision to meet USGS Headquarters and WMPO comments, the report will be approved for publication as a USGS open-file release by June 30.

EVENT: M344 LEVEL: 2 WBS: 2.3.6.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Nov 84
NVO EXPECTED: 05 Nov 84
NVO ACTUAL: 05 Nov 84

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Meteorological Monitoring Plan - Agency Review Draft

CRITERIA: The Meteorological Monitoring Plan (MMP) is a deliverable that outlines a proposed program in support of site characterization studies through the assessment of meteorological and climatological conditions in the Yucca Mountain area. The network of proposed meteorological monitoring stations will also provide a data base suitable for application to state and federal air quality modeling requirements and for assessing potential radiological impacts for NRC purposes. The Plan will be prepared in accordance with state and federal regulatory licensing demands and will be submitted to the appropriate responsible agencies for review, comment, and approval. Upon approval, the Plan will be implemented (level 2 milestone M364).

EVENT: M364 LEVEL: 1 WBS: 2.3.6.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 01 May 85
NVO EXPECTED: 01 Jul 85
NVO ACTUAL:

HQ PLANNED: 01 Jun 85
HQ EXPECTED: 01 Jul 85
HQ ACTUAL:

DESCRIPTION: Implementation of Meteorological Monitoring Plan

CRITERIA: After final approval of the Meteorological Monitoring Plan (level 2 milestone M344), implementation of the Plan and subsequent collection of data on local meteorological conditions will be initiated.

These data will be used in support of repository design activities, acquisition of applicable permits, environmental impact analysis and the assessment of past and present climatic conditions. The data to be acquired include measurements of wind speed, wind direction, sigma theta, ambient temperature, precipitation and relative humidity. The program will continue for at least 5 years with monthly, quarterly and annual data reports being produced. The monthly and quarterly reports are intended for internal program tracking. The annual data reports will be level 2 deliverables with the first such report scheduled for July 1986. The annual reports produced will be submitted to the DOE and appropriate state and federal agencies.

EVENT: M710 LEVEL: 2 WBS: 2.3.6.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	01 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Preliminary Site Specific Transportation Routing Options and Alternative Report

CRITERIA: This deliverable will be a preliminary evaluation directed toward identification and assessment of potential impacts to the regional and local environment of transportation related activities which may result from selection of Yucca Mountain as the site for a high-level radioactive waste repository. Potential impacts, both radiological and non-radiological, will be identified and quantified to the extent possible. This deliverable will be met by submittal of the preliminary Site Specific Transportation Routing Options and Alternative Report to WMPO/NV, for review and comment.

EVENT: M905 LEVEL: 2 WBS: 2.3.7.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Dec 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	01 Mar 85	HQ ACTUAL:	

DESCRIPTION: Preliminary Socioeconomics Studies Report(s)

CRITERIA: A preliminary report or series of companion reports will be prepared addressing six elements. First, issues associated with the socioeconomic impact of the NNWSI Project will be reviewed, categorized, and a response or activities which will lead to a response will be recommended. Second, research conducted to contribute to the resolution of key issues will be documented. Third, case studies will be conducted and documented to provide a practical base of information by which to identify and evaluate alternative approaches for structuring the public participation and impact mitigation aspects of the NNWSI Project. Fourth, community socioeconomic profiles will be developed which summarize community - level data that will serve as a reference base for social and economic studies. Fifth, research will be conducted and documented to identify formal methods of assessing

local and regional attitudes and perceptions of the NNWSI Project. Finally, alternative analytic tools will be evaluated and, as appropriate, recommended for use in evaluating the social, economic and demographic impacts of the NNWSI Project. This deliverable will be met by submittal of the preliminary report(s) to WMPO/NV, for review and comment.

EVENT: M349 LEVEL: 2 WBS: 2.3.9.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	15 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jun 84	HQ ACTUAL:	

DESCRIPTION: Meteorological Monitoring Plan

CRITERIA: This deliverable will be met by submission of a draft plan to the WMPO/NV. This plan will include identification of applicable regulatory requirements and specifications; responsible organizations; proposed sites; equipment specifications; installation, operation, and maintenance procedures; data reporting and analysis procedures; and system and performance audit procedures.

EVENT: None LEVEL: 2 WBS: 2.3.G RESP: USGS STATUS: B WMPO RESP:

NVO PLANNED:	15 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Feb 84	HQ ACTUAL:	

DESCRIPTION: Preliminary EA Contributions

CRITERIA: This deliverable was met by submitting unofficial letter reports to WMPO/NV. The reports by various NNWSI Project investigators summarized known and inferred geologic, hydrologic, and site stability (volcanic and tectonic) conditions at Yucca Mountain and its vicinity. Many of the interpretations are preliminary and are subject to change as additional data are collected. The letter reports will not be published. However, reports containing data analyses, and interpretations resulting from the site investigations and referenceable by the EA will be published for the most part as separate open-file releases and submitted to OGR through WMPO as they become available.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
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EVENT: M350 LEVEL: 2 WBS: 2.3.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jan 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jan 84	HQ ACTUAL:	

DESCRIPTION: Location Performance Objectives for the NNWSI Area-to-Location Screening Activity

CRITERIA: Added reference for EA.

EVENT: M400 LEVEL: 2 WBS: 2.4.1.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	20 Jan 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Dec 83	HQ ACTUAL:	

DESCRIPTION: Information for EA Chapters 4 and 5 Submitted to DOE/NV

CRITERIA: This milestone will be completed by delivery of draft repository description to EA Steering Committee for inclusion in EA.

EVENT: M402 LEVEL: 1 WBS: 2.4.1.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	13 Feb 84	HQ PLANNED:	13 Feb 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Feb 84	HQ ACTUAL:	13 Feb 84

DESCRIPTION: 1998 Repository Construction Completion Analysis

CRITERIA: A brief, intensive study on the cost and schedule for construction of various repository design options. A memo-report to WMPO/NV together with presentation information to HQ was the resulting product.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M403 LEVEL: 1 WBS: 2.4.1.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	29 Feb 84	HQ PLANNED:	29 Feb 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Feb 84	HQ ACTUAL:	29 Feb 84

DESCRIPTION: Alternative Construction Scenarios Analysis

CRITERIA: Study on the cost and schedule for construction of various repository design options to support development of the mission plan. Options were specified by DOE/HQ and were based on the 1998 repository construction completion analysis. A memo-report to NV was the resulting product.

EVENT: M410 LEVEL: 2 WBS: 2.4.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	28 Sep 84	HQ EXPECTED:	
NVO ACTUAL:	03 Oct 84	HQ ACTUAL:	

DESCRIPTION: Reference Waste Inventory for Conceptual Design

CRITERIA: This study extracts data from the draft GR MGDSD Appendix B, augments the data, where necessary, with assumptions and analysis and establishes the reference waste inventory for conceptual design. This milestone is satisfied by forwarding a draft report to WMPO.

EVENT: M450 LEVEL: 2 WBS: 2.4.1.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	16 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jan 84	HQ ACTUAL:	

DESCRIPTION: Pre-closure Off-site Radiation Exposure Assessment for EA

CRITERIA: This milestone will be met by delivery to WMPO/NV for policy review of a draft SAND report on potential off-site radiation exposure.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M406 LEVEL: 1 WBS 2 4 1 2 S RESP SNL STATUS B WMPO RESP:

NVO PLANNED	26 Jul 84	HQ PLANNED	26 Jul 84
NVO EXPECTED		HQ EXPECTED	
NVO ACTUAL	26 Jul 84	HQ ACTUAL	26 Jul 84

DESCRIPTION: Two-stage Repository Feasibility Study

CRITERIA: This study investigated the feasibility of receiving 400 MTU of SF/yr starting in January 1998 by constructing a small, simple facility while the larger one is being constructed. This milestone is satisfied by forwarding a draft of SAND84-1351, "Two-stage Repository Development: An Engineering Feasibility Study" to WMPO/NV.

EVENT: M409 LEVEL: 2 WBS: 2.4 1 2 S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	15 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Feb 84	HQ ACTUAL:	

DESCRIPTION: Waste Handling Operations Plan Submitted

CRITERIA: This milestone will be met by submittal of a draft SAND report to WMPO/NV for policy review. The waste handling operations plan contains descriptions of operations required to receive, prepare waste for emplacement, emplace waste, and retrieve waste. The operations are described as they were envisioned before the beginning of the repository conceptual design, that is, before February 1984.

EVENT: M416 LEVEL: 2 WBS: 2.4.1 2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	01 Sep 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Aug 84	HQ ACTUAL:	

DESCRIPTION: Recommendation of Reference Location for Surface Facilities for Conceptual Design

CRITERIA: This study collects existing data, site requirements, establishes an evaluation process, evaluates the data and recommends a reference location for the surface facilities for the conceptual design. This milestone will be completed by forwarding a letter report to WMPO/NV. (Updated per verbal from Larry Skousen, WMPO/NV 12/10/84).

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M418 LEVEL: 2 WBS: 2.4 1.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	31 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 May 84	HQ ACTUAL:	

DESCRIPTION: NNWSI Repository Work Radiation Exposure, Volume I, Spent Fuel and High Level Waste Operations in a Geologic Repository in Tuff

CRITERIA: Added reference for EA.

EVENT: M417 LEVEL: 2 WBS: 2.4.1.3.S RESP: SNL STATUS: B WMPO RESP

NVO PLANNED:	08 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	18 Oct 84	HQ ACTUAL:	

DESCRIPTION: Alternate Exploratory Shaft Configurations and Repository Use

CRITERIA: This study investigated 9 different options for a second access into the ESF, how they would be used in the repository, and what impact they would have on cost and schedule. This milestone is satisfied by sending a draft of SAND 84-1261, "Recommendation for a Second Access for the Yucca Mountain Exploratory Shaft Facility" to WMPO/NV.

EVENT: M412 LEVEL: 2 WBS: 2.4.1.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	30 Apr 85	HQ EXPECTED:	
NVO ACTUAL:	12 Apr 85	HQ ACTUAL:	

DESCRIPTION: Report on Underground Facility Layout Requirements

CRITERIA: This milestone will be met by submitting to WMPO/NV for policy review the report "Underground Facility Area Requirements for a Nuclear Waste Repository at Yucca Mountain."

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M414 LEVEL: 2 WBS: 2.4.1.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Mar 86	HQ PLANNED:	
NVO EXPECTED:	28 Mar 86	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on Far-Field Thermal Mechanical Effects

CRITERIA: This deliverable will be a draft SAND report submitted to WMPO/NV for policy review. This report describes the far-field analyses done to establish the conceptual design waste loading. It will be based upon geologic data available as of June 1984 and will include rock mass effects, updated stratigraphy, and other improvements over the unit evaluation study.

EVENT: M415 LEVEL: 2 WBS: 2.4.1.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Aug 84	HQ ACTUAL:	

DESCRIPTION: Draft Report on Position of Underground Facility in Yucca Mountain

CRITERIA: The deliverable will be a draft SAND report submitted to WMPO/NV for policy review. The report will describe the area within the Yucca Mountain region being explored that is usable for a repository. (See SAND84-0175)

EVENT: M419 LEVEL: 2 WBS: 2.4.1.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	09 Jan 85	HQ ACTUAL:	

DESCRIPTION: A Comparitive Study of Waste Emplacement Configurations for the NNWSI Project

CRITERIA: Added reference for EA.

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EVENT: M401 LEVEL: 1 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	16 Jan 84	HQ PLANNED:	16 Jan 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	16 Jan 84	HQ ACTUAL:	16 Jan 84

DESCRIPTION: Submit Preliminary Logic Network for Repository

CRITERIA: This deliverable was met by submission of a preliminary summary logic network depicting the planned tasks to be accomplished in the Repository portion of the WBS.

EVENT: N400 LEVEL: 2 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jan 85	HQ ACTUAL:	

DESCRIPTION: Data Index Development

CRITERIA: The milestone will be met by transmittal of a letter to WMPO/NV that contains an index of data taken for use in repository design. Bulk, thermal and mechanical properties data sets will be listed along with weapons test seismic data sets. The index is being created pursuant to the site-specific procedural agreement between DOE and NRC.

EVENT: N407 LEVEL: 2 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	30 Nov 84	HQ EXPECTED:	
NVO ACTUAL:	15 Sep 84	HQ ACTUAL:	

DESCRIPTION: NNWSI Project Preliminary Repository Concepts Report

CRITERIA: Added reference for EA.

MILESTONE REPORT
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EVENT: N416 LEVEL: 2 WBS: 2.4 1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED: 30 Aug 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: NRC Repository Design Workshop for Seismic Tectonics - Seismic Study

CRITERIA: This milestone will be met by submitting a letter to WMPO/NV that documents the actual agenda, attendees, and action items from the first repository Seismic Tectonics - Seismic Study workshop. This deliverable will be submitted within 10 working days after the conclusion of the workshop.

EVENT: N430 LEVEL: 1 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED: 30 Sep 85 HQ PLANNED: 30 Sep 85
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Start Repository Conceptual Design

CRITERIA: A letter to WMPO/NV will be issued stating that Sandia and the contractor have formally begun repository conceptual design activities.

EVENT: N432 LEVEL: 1 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED: 30 Jul 85 HQ PLANNED: 30 Sep 85
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: NNWSI Project Site Specific Repository Design Concepts Report

CRITERIA: The existing two-stage repository study will be revised and expanded to provide a Repository Design Concepts Report which will serve as a reference for Chapter 6 of the SCP. This report will reflect repository design concepts as of December 1984. Submit report (SAND84-2641) to WMPO/NV for policy review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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04 June 85

EVENT: N433 LEVEL: 1 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Aug 85	HQ PLANNED:	30 Oct 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Initial Functional Design Criteria to DOE/NV For Review

CRITERIA: The document currently known as the "Design Guidelines for a Tuff Repository at the Nevada Test Site" will be extensively revised to create a design criteria document sufficient to support the FY 86 and FY 87 Repository Conceptual Design work. This document will also serve as the basis for the Title I Design Criteria Document. Submit report to WMPO/NV for policy review.

EVENT: N434 LEVEL: 2 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Conceptual Design Plan Incorporating New Guidance

CRITERIA: A Conceptual Design plan will be prepared in accordance with DOE Order 6410.1. This plan will be based on DOE program guidance as of November 1, 1984. This deliverable will be met by submitting SAND83-1839 "Conceptual Design Plan for a Tuff Repository at the Nevada Test Site," to WMPO/NV for policy review.

EVENT: N446 LEVEL: 2 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Seismic Design Bases

CRITERIA: The NNWSI Project approach to establishing repository design criteria, including site characterization, and safety assessment with respect to tectonics and seismicity, leading to eventual construction authorization and operating permit. A SAND report will be forwarded to WMPO/NV for policy review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
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EVENT: N447 LEVEL: 2 WBS: 2.4.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Plan for Bow Ridge Fault Characterization

CRITERIA: This plan identifies the essential field and analytical work on the Bow Ridge Fault required to characterize the fault and to obtain designation for surface facilities. This plan will incorporate the philosophy of the seismic position paper and will detail a portion of site characterization work. The milestone will be completed by forwarding the plan as a letter report to WMPO/NV for policy review.

EVENT: M444 LEVEL: 2 WBS: 2.4.2.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Update On Rock Mass Properties for Conceptual Design

CRITERIA: This deliverable will be a keystone memo that updates the rock-mass thermal and mechanical properties recommended for use in subsequent conceptual design analysis. The recommendations will be based on available laboratory and field measurements and finite-element calculations.

EVENT: N445 LEVEL: 2 WBS: 2.4.2.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	31 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Rock Mechanics Plan

CRITERIA: A plan for rock mechanics work in support of the NNWSI Project will be prepared. The work will synopsize the status and contributions made to date, identify and prioritize data needed, and will define planned laboratory and field tests. Analysis techneques will be reviewed, development needs identified, and anticipated verification and validation analyses will be defined. The plan will be a reference for the SCP. The milestone will be met by delivery of a SAND report to WMPO/NV for policy review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
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EVENT: M433 LEVEL: 2 WBS: 2.4.2.1.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	31 Jul 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on the Heated block experiment

CRITERIA: The deliverable will be the report, SAND84-2620, "G-Tunnel Heated Block Experiment", containing results and analyses of slotcutting, ambient-temperature, and thermal-cycle testing in the G-tunnel heated block.

EVENT: N444 LEVEL: 2 WBS: 2.4.2.1.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: G-Tunnel Small Diameter Heater Experiments

CRITERIA: The results of the three small diameter heater experiments recently completed in G-Tunnel will be documented. The deliverable will be the report, SAND84-2621, "G-Tunnel Small Diameter Heater Experiments," submitted to WMPO/NV for policy review.

EVENT: N481 LEVEL: 2 WBS: 2.4.2.1.3.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	31 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	10 Jan 85	HQ ACTUAL:	

DESCRIPTION: Lithophysal Effects on Mechanical Properties

CRITERIA: The purpose of this study is to determine the effects of the presence of lithophysae on mechanical properties of Topopah Spring tuff. The results will be used for design purposes and to aid in analyzing the extent of the useable area at Yucca Mountain. The milestone will be met by submitting to WMPO/NV for policy review a draft copy of SAND84-0860, "Preliminary Characterization of the Petrologic, Bulk and Mechanical Properties of a Lithophysal Zone Within the Topopah Spring Member of the Paintbrush Tuff".

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: N402 LEVEL: 2 WBS: 2.4.2.1.3.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Mar 85	HQ ACTUAL:	

DESCRIPTION: Thermal Conductivity of Yucca Mountain and G-Tunnel Tuffs

CRITERIA: The purpose of this study is to measure the thermal conductivity of tuffs from Yucca Mountain and G-Tunnel to provide data for modeling of thermal and thermal/mechanical behavior of tuffs in response to heater experiments as well as projected waste emplacement. The milestone will be met by submitting to WMPO/NV for policy review a draft copy of SAND83-1711/J, "Thermal Properties of Silicic Tuffs from Yucca Mountain and Rainier Mesa, Nye County, Nevada."

EVENT: N404 LEVEL: 2 WBS: 2.4.2.1.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Report on the Estimation of Rock Mass Hydrologic Properties of Tuffaceous Materials From Yucca Mountain

CRITERIA: The deliverable will be the report, SAND84-2642, "Rockmass Hydro- logic Property Estimation", submitted to WMPO/NV for policy review that describes the estimation of relative conductivity curves for a rock mass, incorporating both fracture and matrix effects.

EVENT: M451 LEVEL: 2 WBS: 2.4.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	25 Oct 84	HQ ACTUAL:	

DESCRIPTION: Rock Mass Properties Recommendation for CDR and WP Design

CRITERIA: The deliverable is a keystone memo submitted to WMPO/NV for review. The memo documents thermal and mechanical properties recommended for use in design analyses that support conceptual designs.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M489 LEVEL: 2 WBS: 2.4.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	31 Jan 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	01 Dec 83	HQ ACTUAL:	

DESCRIPTION: Complete Rock Summary for Input to EA

CRITERIA: This milestone will be completed by delivery to SNL EA Steering Committee representative a summary of thermal and mechanical rock properties recommended for use in EA analyses.

EVENT: M496 LEVEL: 2 WBS: 2.4.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	19 Sep 84	HQ PLANNED:	
NVO EXPECTED:	14 Dec 84	HQ EXPECTED:	
NVO ACTUAL:	06 Dec 84	HQ ACTUAL:	

DESCRIPTION: Report on Geo-Engineering Properties of Potential Repository Units

CRITERIA: This milestone will be completed by submitting to WMPO/NVO a draft of SAND84-0221. This report describes the rock mechanics properties of various units at Yucca Mountain.

EVENT: M486 LEVEL: 2 WBS: 2.4.2.2.1 S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Complete Design of Horizontal Drill System

CRITERIA: Design drawings and specifications will be developed for the horizontal drilling system. This will consist of the drilling head, motor and drive-train, laser guidance system, chip removal system, and all other support equipment. The drawings and specifications developed will give a more precise estimate of costs and fabrication time required for producing the drill equipment. This deliverable will be met by submitting a SAND report to WMPO/NV for policy review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
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EVENT: N406 LEVEL: 1 WBS: 2.4.2.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Jun 85	HQ PLANNED:	30 Aug 85
NVO EXPECTED:	30 Sep 85	HQ EXPECTED:	29 Nov 85
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Horizontal Waste Emplacement Equipment Development Plan

CRITERIA: This is a discussion of the horizontal emplacement concept and the equipment required to demonstrate the concept in basalt, tuff, and granite. Included will be a development and demonstration schedule and estimate of resources required. This milestone will be met by a SAND report, SAND84-2197, "A Recommendation for Tuff, Basalt, and Granite," to WMPO/NV for policy review and forwarding to other projects and headquarters.

EVENT: N440 LEVEL: 2 WBS: 2.4.2.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	03 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Vertical Waste Emplacement System Conceptual Design

CRITERIA: This milestone signifies the completion of the conceptual design of the equipment and operational procedures for emplacement and retrieval of waste at the potential NNWSI Project repository. The deliverable will be a SAND84-1010, "Disposal of Canistered Waste in Vertical Boreholes — A Description of the System, Equipment and Procedures for Emplacement and Retrieval." The milestone will be met by submitting SAND report to WMPO/NV for policy review.

EVENT: N450 LEVEL: 2 WBS: 2.4.2.2.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	03 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Horizontal Waste Emplacement System Conceptual Design

CRITERIA: This milestone signifies the completion of the conceptual design of the equipment and operational procedures for emplacement and retrieval of waste at the potential NNWSI Project repository. The deliverable will be SAND84-2640, "Disposal of Canistered Waste in Horizontal Boreholes - A description of the System, Equipment, and Procedures for Emplacement and Retrieval (NNWSI Project)."

This milestone will be met by submitting SAND report to WMPO/NV for policy review.

EVENT: M447 LEVEL: 1 WBS: 2.4.2.3.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	24 Sep 84	HQ PLANNED:	12 Nov 84
NVO EXPECTED:	24 Sep 84	HQ EXPECTED:	
NVO ACTUAL:	23 Oct 84	HQ ACTUAL:	17 Dec 84

DESCRIPTION: Seal Development Plan for Repository to OCRWM for Review

CRITERIA: This deliverable will be met by submittal of a draft report to WMPO/NV for review by April 30. After WMPO review and incorporation of comments during May, the draft report will be submitted to OCRWM through WMPO by May 30. The report will be based upon the sealing concepts developed during FY 1983 and will define the technical issues related to sealing, document the approach to be taken to resolve the issues, and present a schedule for resolving issues.

EVENT: N411 LEVEL: 2 WBS: 2.4.2.3.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	20 Feb 85	HQ ACTUAL:	

DESCRIPTION: Response to LANL on QA Levels for Exploratory Shaft Facility (ESF)

CRITERIA: The milestone will be met by the transmittal of a letter report to LANL (copy to WMPO/NV) that documents the analyses made and conclusions reached relative to the impact on sealing of rock damage during construction, the performance expected of the concrete liner, and the functional requirements for ESF shaft internals when used in the repository. The input will be used by LANL to aid in determining QA levels appropriate for the ESF design and construction.

EVENT: M448 LEVEL: 2 WBS: 2.4.3.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Jun 84	HQ ACTUAL:	

DESCRIPTION: Draft Report on Sealing Concepts Complete

CRITERIA: The deliverable will be met by submittal of a draft SAND report to WMPO/NV for policy review. This report includes a description of the hydrologic setting of Yucca Mountain, the preliminary design

concepts, and review of the Federal and State regulations that may be applicable for the sealing program, and a description of the design objectives. Design constraints are defined and numerical analyses are presented to evaluate sealing concepts. Sealing concepts for a repository in partially saturated Topopah Spring tuff are presented.

EVENT: N449 LEVEL: 2 WBS: 2.4.3.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	18 Feb 85	HQ ACTUAL:	

DESCRIPTION: Documentation for Surface Facility Siting Study

CRITERIA: This study evaluates six locations for surface facilities on the eastern side of Yucca Mountain. The evaluation uses siting criteria derived from 10 CFR 960. The milestone will be met by submitting SAND84-2015, "Location Recommendation for Surface Facilities for the Prospective Yucca Mountain Nuclear Waste Repository," to WMPO/NV for review. This will provide the reference documentation for the letter report (milestone M416) that specifies the location.

EVENT: N488 LEVEL: 2 WBS: 2.4.3.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	30 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	19 Oct 84	HQ ACTUAL:	

DESCRIPTION: Meteorological Design Parameters: Yucca Mountain Repository, Nevada Test Site

CRITERIA: Added reference for EA. (See SAND84-0448/2).

EVENT: M442 LEVEL: 2 WBS: 2.4.3.3.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	01 Oct 84	HQ ACTUAL:	

DESCRIPTION: Lining Considerations for a Circular Vertical Shaft in Generic Tuff

CRITERIA: Added reference for EA. (See SAND83-7068).

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04 June 85

EVENT: M452 LEVEL: 2 WBS: 2.4.3.3.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	30 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	22 Oct 84	HQ ACTUAL:	

DESCRIPTION: Preliminary Stability Analysis for the Exploratory Shaft - Yucca Mountain, Nevada

CRITERIA: Added reference for EA. (See SAND83-7069)

EVENT: M498 LEVEL: 2 WBS: 2.4.3.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	30 Nov 84	HQ EXPECTED:	
NVO ACTUAL:	25 Jul 84	HQ ACTUAL:	

L SCRIPTION: An Evaluation of the Effects of the Horizontal and Vertical Emplacement on Mining at the Yucca Mountain Repository Site

CRITERIA: Added reference for EA. (See SAND83-7443).

EVENT: M497 LEVEL: 2 WBS: 2.4.3.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	11 Jul 84	HQ ACTUAL:	

DESCRIPTION: Conceptual Operations Report for a Repository at Yucca Mountain

CRITERIA: Added reference for EA. (See SAND83-7446).

EVENT: M498 LEVEL: 2 WBS: 2.4.3.4.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	02 Nov 84	HQ ACTUAL:	

DESCRIPTION: Effect of Variations in the Geologic Data Base on Mining at Yucca Mountain

CRITERIA: Added reference for EA. (See SAND84-7125).

EVENT: M413 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Sep 86	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Near-Field Thermal Effects and Structural Stability Report

CRITERIA: The report describes the near-field analysis done as a part of the conceptual design. It will be based upon the most recent reference set of geologic, waste package, waste characterization, and mining data. This milestone will be met by submitting a SAND report to WMPO/NV for review.

EVENT: M491 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Summary Report on Thermomechanical Analysis as SCP Reference

CRITERIA: This deliverable is the report, SAND84-2637, "Summary of Thermomechanical Analyses in Support of Code Verification," submitted for policy review on the status of thermomechanical models/analysis for use as an SCP reference.

EVENT: N412 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Feb 85	HQ PLANNED:	
NVO EXPECTED:	29 Mar 85	HQ EXPECTED:	
NVO ACTUAL:	28 Feb 85	HQ ACTUAL:	

DESCRIPTION: TRU Standoff Distance

CRITERIA: This study establishes the rock temperature vs distance to the heatproducing waste. This relationship will form the basis for determining the distance that TRU waste should be placed from heat producing waste. This milestone will be met by submitting Keystone 6310-84-1, "Determination of Maximum Temperature as a Function of Distance From a Spent Fuel and a Commercial High-Level Waste Repository," to WMPO/NV for review.

EVENT: N413 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:	31 Jul 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Minimum Borehole Spacing

CRITERIA: This milestone will be completed by submitting a report, SAND84-7214, "An Investigation to Determine the Minimum Spacing of Canister-Boreholes for Low-Level Waste in a Tuff Repository," to WMPO/NV for policy review.

EVENT: N414 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:	30 Sep 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Shaft vs. Ramp Emplacement Panel Interaction

CRITERIA: This milestone will be met by submitting to WMPO/NV a report, SAND84-7213, "Interaction of Nuclear-Waste Panels with Shafts and Access Ramps for a Potential Repository at Yucca Mountain," comparing the shaft and ramp emplacement panel interactions that result from thermally-induced stress.

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EVENT: N451 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:	30 Jul 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Thermal Analysis of BWR Spent Fuel Vertical Emplacement

CRITERIA: This milestone will be met by forwarding a report, SAND84-7207, "Thermal Analysis of BWR - Spent Fuel Vertical Emplacement Scheme," to WMPO/NV for policy review.

EVENT: N452 LEVEL: 2 WBS: 2.4.6.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	29 Mar 85	HQ PLANNED:	
NVO EXPECTED:	30 Jul 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Thermomechanical Analysis of Access Drifts, Storage Drifts and Alcoves, and the Access Drift/Storage Drift Intersection

CRITERIA: This milestone will be met by submitting to WMPO/NV a report, SAND84-7208, "Thermomechanical Analysis of Underground, Excavations in the Vicinity of a Nuclear-Waste Panel," analyzing three-dimensional effects of drift intersections and alcoves and comparing them to drifts.

EVENT: M499 LEVEL: 2 WBS: 2.4.6.3.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	06 Nov 84	HQ ACTUAL:	

DESCRIPTION: Preliminary Safety Assesment Study for the NNWSI Project

CRITERIA: Added reference for EA. (See SAND83-1504).

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M510 LEVEL: 2 WBS: 2.5.1.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	20 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	20 Jul 84	HQ ACTUAL:	

DESCRIPTION: NRC Design/Rock Mechanics Data Review

CRITERIA: This milestone was met by preparing information for review and conducting a data review with the NRC. It included key SNL staff members working directly with the NRC participants to review all data pertaining to lab and field testing in rock mechanics, sealing and weapons test seismic work.

EVENT: M550 LEVEL: 2 WBS: 2.5.2.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:	30 Aug 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Regulatory Compliance Plan

CRITERIA: This deliverable will be met by submittal of a draft Regulatory Compliance Plan to WMPO/NV for approval and distribution to the NNWSI Project. The plan will relate regulatory requirements to Project activities, strategies, methods, and responsibilities for interacting with NRC.

EVENT: M360 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 May 85	HQ PLANNED:	
NVO EXPECTED:	10 Jul 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Provide Input for Draft SCP Chapter 4 - LANL from Geochemistry

CRITERIA: The deliverable will be met by LANL submission for WMPO/NV approval of the initial input of Chapter 4 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M506 LEVEL: 2 WBS: 2 5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	01 Mar 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	11 Mar 85	HQ ACTUAL:	

DESCRIPTION: Response to the NRC's Comments on the July 1984 Geochemistry Workshop

CRITERIA: LANL will complete its reply to the NRC's comments on the JULY 1984 Geochemistry Workshop. A copy of the information will be sent to WMPO/NV.

EVENT: M507 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	17 May 85	HQ PLANNED:	
NVO EXPECTED:	21 Jun 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Information Need Descriptions - LANL Input for 8.3.1

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL draft information needs for subsection 8.3.1. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M570 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	17 May 85	HQ PLANNED:	
NVO EXPECTED:	21 Jun 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Information Need Descriptions - LANL Input for 8.3.2

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL draft information needs for subsection 8.3.2. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M574 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 21 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - LANL Input for 8.3.5

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL draft information needs for subsection 8.3.5. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M578 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85
NVO EXPECTED: 26 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - LANL Input for Subsection 8.3.1

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL portion of subsection 8.3.1. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M583 LEVEL: 2 WBS: 2.5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85
NVO EXPECTED: 26 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - LANL Input for Subsection 8.3.2

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL portion of subsection 8.3.2. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M587 LEVEL: 2 WBS: 2 5.2.2.A RESP: LANL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85
NVO EXPECTED: 26 Jul 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - LANL Input for Subsection 8.3.5

CRITERIA: This deliverable will be met by LANL submission for WMPO/NV approval of the LANL portion of subsection 8.3.5. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M508 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 Apr 85
NVO EXPECTED: 07 Jun 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 5 - USGS Input for Subsection 5.2

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the initial draft of Section 5.2 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

EVENT: M511 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 22 May 85
NVO EXPECTED: 14 Jun 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 3 USGS Input

CRITERIA: This deliverable will be met by submission for WMPO/NV approval of the initial draft of Chapter 3 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M512 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 07 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - USGS Input 8.3.1

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the USGS draft information needs for subsection 8.3.1. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M558 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 08 May 85
NVO EXPECTED: 14 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 1 USGS Input

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the initial draft of Chapter 1 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

EVENT: M577 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 07 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - USGS Input 8.3.5

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the USGS draft information needs for subsection 8.3.5. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M582 LEVEL: 2 WBS 2.5 2.2 G RESP: USGS STATUS. B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85 HQ PLANNED:
NVO EXPECTED: 12 Jul 85 HQ EXPECTED
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - USGS Input for Subsection 8.3.1

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the USGS portion of subsection 8.3.1. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M590 LEVEL: 2 WBS: 2.5.2.2.G RESP: USGS STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85 HQ PLANNED:
NVO EXPECTED: 12 Jul 85 HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - USGS Input for Subsection 8.3.5

CRITERIA: This deliverable will be met by USGS submission for WMPO/NV approval of the USGS portion of subsection 8.3.5. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M500 LEVEL: 2 WBS: 2.5.2.2.L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 03 May 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 7 LLNL Input

CRITERIA: This deliverable will be met by LLNL submission for WMPO/NV approval of the initial input of Chapter 7 of the SCP, with references, and glossary. The deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M581 LEVEL: 2 WBS: 2 5 2 2.L RESP: LLNL STATUS B WMPO RESP: Blanchard

NVO PLANNED: 30 Jun 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED
NVO ACTUAL: HQ ACTUAL

DESCRIPTION: Submit Updated Chapter 8 Waste Package Input to Site Characterization Plan.

CRITERIA: This deliverable will be met by submission of SCP input from the TPO-LLNL to WMPO/NV. LLNL input to Chapter 8 will have to be revised to reflect changes and new data since the February 1983 version.

EVENT: M573 LEVEL: 2 WBS: 2.5.2 2.L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85 HQ PLANNED.
NVO EXPECTED: 28 Jun 85 HQ EXPECTED
NVO ACTUAL: HQ ACTUAL

DESCRIPTION: Draft SCP Information Need Descriptions - LLNL Input for Subsection 8.3.4

CRITERIA: This deliverable will be met by LLNL submission for WMPO/NV approval of the LLNL draft information needs for subsection 8.3.4. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M575 LEVEL: 2 WBS: 2.5.2 2 L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85 HQ PLANNED:
NVO EXPECTED: 14 Jun 85 HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - LLNL Input for Subsection 8.3 5

CRITERIA: This deliverable will be met by LLNL submission for WMPO/NV approval of the LLNL draft information needs for subsection 8.3.5. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS.EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M588 LEVEL: 2 WBS: 2.5.2.2.L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85
NVO EXPECTED: 19 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - LLNL Input for Subsection 8.3.5

CRITERIA: This deliverable will be met by LLNL submission for WMPO/NV approval of the LLNL portion of subsection 8.3.5. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M594 LEVEL: 2 WBS: 2.5.2.2.L RESP: LLNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85
NVO EXPECTED: 16 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - Input Complete for Subsection 8.3.4

CRITERIA: This deliverable will be met by LLNL submission for WMPO/NV approval of subsection 8.3.4. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M139 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85
NVO EXPECTED: 09 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - Subsection 8.3.2 Complete

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of subsection 8.3.2. The deliverable will be prepared in accordance with the approved style guide, annotated outline and the SCP Management Plan work instructions. Milestones M570, M571, and M573 are required to complete this milestone.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M443 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 08 May 85 HQ PLANNED:
NVO EXPECTED: 10 May 85 HQ EXPECTED:
NVO ACTUAL: 09 May 85 HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 2 - SNL Input

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the initial input of Chapter 2 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

EVENT: M453 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 28 Jun 85 HQ PLANNED:
NVO EXPECTED: 19 Jul 85 HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 6 - SNL Input

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the initial input of Chapter 6 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

EVENT: M513 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85 HQ PLANNED:
NVO EXPECTED: 24 May 85 HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - SNL Input 8.3 1

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the SNL draft information needs for subsection 8.3.1. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M571 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 24 May 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - SNL Input 8.3.2

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the SNL draft information needs for subsection 8.3.2. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M572 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 24 May 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - SNL Input 8.3.3

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the SNL draft information needs for subsection 8.3.3. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M576 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 24 May 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - SNL Input for Subsection 8.3.5

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of the SNL draft information needs for subsection 8.3.5. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M581 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 21 Jun 85
NVO EXPECTED: 05 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SNL Input for Subsection 8.3.1

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of SNL portion of subsection 8.3.1. The deliverable will be prepared n accordance the approved style guide, the annotated outline and with the SCP Management Plan work instructions.

EVENT: M593 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85
NVO EXPECTED: 19 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - Subsection 8.3.3 Complete

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of subsection 8.3.3. The deliverable will be prepared in accordance with the approved style guide, annotated outline and the SCP Management Plan work instructions. Milestone M572 is required to complete this milestone.

EVENT: N125 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 02 May 85
NVO EXPECTED: 24 May 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - Systems Requirements Portion Criteria

CRITERIA: Section 8.1 of chapter 8 of hte SCP calls for plans to develop a quantitative basis for information needs from site characterization. This quantitative basis results from regulatory requirements placed on the repository system and subsystems. The deliverable will be met by submitting a plan for developing the detailed quantitative basis and information needs to the SCP compilers.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: N420 LEVEL: 2 WBS: 2.5.2.2.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:	09 Aug 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Chapter 8 - Subsection 8.3.5 Complete

CRITERIA: This deliverable will be met by SNL submission for WMPO/NV approval of subsection 8.3.5. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions. Milestones M587, M588, and M590 are required to complete this milestone.

EVENT: M514 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	17 Apr 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	18 Apr 85	HQ ACTUAL:	

DESCRIPTION: Draft SCP Chapter 5 - SAIC Input for 5.1

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of Section 5.1 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M515 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	03 May 85	HQ PLANNED:	
NVO EXPECTED:	14 Jun 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input for 8.1

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of Section 8.1 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M517 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85	HQ PLANNED:
NVO EXPECTED: 16 Aug 85	HQ EXPECTED:
NVO ACTUAL:	HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input for 8.5

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of Section 8.5 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide the annotated outline and the SCP Management Plan work instructions.

EVENT: M518 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 18 Jun 85	HQ PLANNED:
NVO EXPECTED: 02 Jul 85	HQ EXPECTED:
NVO ACTUAL:	HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input for 8.6

CRITERIA: This deliverable will be met by SAIC submission for /NV approval of the initial input of Section 8.6 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M521 LEVEL: 1 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 06 Dec 85	HQ PLANNED: 06 Dec 85
NVO EXPECTED: 17 Jan 86	HQ EXPECTED:
NVO ACTUAL:	HQ ACTUAL:

DESCRIPTION: Draft Site Characterization Plan

CRITERIA: This deliverable will be met by submission of a draft site characterization plan (SCP) to NVO and DOE/HQ. The SCP is required by the Nuclear Waste Policy Act. The Nuclear Regulatory Commision (NRC) has issued a regulatory guide specifying the contents of the SCP. The SCP must be submitted to the NRC prior to starting the exploratory shaft. The SCP establishes baseline understanding of the three sites recommended by the Secretary of DOE to the President for detailed site characterization.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M522 LEVEL: 1 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 07 Mar 86
NVO EXPECTED: 18 Apr 86
NVO ACTUAL:

HQ PLANNED: 07 Mar 86
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Site Characterization Plan

CRITERIA: This deliverable will be met by submission of a final camera ready copy of the SCP to WMPO/NV and DOE/HQ. DOE/HQ will be responsible for printing and distributing copies of the SCP. The schedule for this deliverable is contingent upon receiving DOE/HQ approval of the draft SCP no later than February 8, 1986 (see M521).

EVENT: M524 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input for 8.7

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of Section 8.7 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M525 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 14 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input for 8.2

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of Section 8.2 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

EVENT: M526 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 17 May 85
NVO EXPECTED: 14 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Information Need Descriptions - SAIC Input 8.3.1

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the SAIC draft information needs for subsection 8.3.1. The deliverable will be prepared in accordance with the SCP Management Plan work instructions.

EVENT: M527 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 24 May 85
NVO EXPECTED: 26 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Initial SCP Introduction Input

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial input of the introduction of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style, and the annotated outline and the SCP Management Plan work instructions.

EVENT: M528 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 03 Jul 85
NVO EXPECTED: 13 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 5 Complete

CRITERIA: This deliverable will be met by submission of the draft of Chapter 5 of the SCP to the WMPO/NV. The initial chapter inputs, M514 and M508, will have completed review and technical editing cycles to produce this deliverable.

EVENT: M529 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85
NVO EXPECTED: 16 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Section 8.1 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.1 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M515, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M540 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 19 Jun 85
NVO EXPECTED: 26 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 7 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 7 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M500, wil have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M541 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 26 Jul 85
NVO EXPECTED: 20 Sep 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Introduction Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of the introduction to the SCP to the WMPO/NV for submittal to DOE/HQ. The input needed to complete the introduction, M527, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M542 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 03 Jul 85
NVO EXPECTED: 12 Jul 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 2 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 2 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M443, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M543 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 28 Aug 85
NVO EXPECTED: 20 Sep 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 6 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 6 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M453, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M544 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 04 Oct 85
NVO EXPECTED: 15 Nov 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.3 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.3 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M546, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M545 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 02 Aug 85
NVO EXPECTED: 09 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.4 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.4 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M557, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M546 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 02 Aug 85
NVO EXPECTED: 13 Sep 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.3

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial draft of Section 8.3 of the SCP. Required milestones are M139, M591, M593, M594, and N420, with references and glossary. This deliverable will be prepared in accordance with the approved style guide, the annotated outline, and the SCP Management Plan work instructions.

EVENT: M547 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 06 Sep 85
NVO EXPECTED: 18 Oct 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.5 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.5 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M517, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M548 LEVEL: 2 WBS: 2 5 2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	07 Aug 85	HQ PLANNED:	
NVO EXPECTED:	11 Sep 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Chapter 4 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 4 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M360, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M549 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	20 Aug 85	HQ PLANNED:	
NVO EXPECTED:	30 Sep 85	HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Draft SCP Chapter 8 Section 8.6 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.6 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M518, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M554 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	28 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	05 Mar 85	HQ ACTUAL:	

DESCRIPTION: Site Characterization Plan (SCP) Management Plan Approved by WMPO/NV

CRITERIA: This deliverable will bet met by submission of a proposed SCP Activity Plan to WMPO/NV for review and comment. This draft plan will describe the activities that the project will follow in the preparation, coordination and integration of the SCP. The plan will designate responsible SCP authors, review teams, schedules and the review process. It will be revised according to guidance from WMPO/NV and DOE/HQ.

EVENT: M556 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 19 Jul 85
NVO EXPECTED: 09 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.7 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.7 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M524, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M557 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 31 May 85
NVO EXPECTED: 07 Jun 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - SAIC Input - for Section 8.4

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of the initial draft of Section 8.4 of the SCP, with references and glossary. This deliverable will be prepared in accordance with the approved style guide and the annotated outline and the SCP Management Plan work instructions.

EVENT: M559 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 19 Jul 85
NVO EXPECTED: 16 Aug 85
NVO ACTUAL:

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 Section 8.2 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Section 8.2 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M525, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M560 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 31 Jul 85
NVO EXPECTED: 06 Sep 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 1 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 1 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M558, will hae completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M561 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 31 Jul 85
NVO EXPECTED: 30 Aug 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 3 Complete

CRITERIA: This deliverable will be met by SAIC submission of the draft of Chapter 3 of the SCP to the WMPO/NV for submittal to DOE/HQ. The chapter input needed to complete this chapter, M511, will have completed internal review and incorporation of comments (cycle 1) to produce this deliverable.

EVENT: M591 LEVEL: 2 WBS: 2.5.2.2.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED: 05 Jul 85
NVO EXPECTED: 09 Aug 85
NVO ACTUAL:
HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Draft SCP Chapter 8 - Subsection 8.3.1 Complete

CRITERIA: This deliverable will be met by SAIC submission for WMPO/NV approval of subsection 8.3.1. The deliverable will be prepared in accordance with the approved style guide, the annotated outline and the SCP Management Plan work instructions.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M422 LEVEL: 2 WBS: 2.5.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	31 Jul 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Jul 84	HQ ACTUAL:	

DESCRIPTION: NNWSI Project Environmental Characterization

CRITERIA: Added reference for EA.

EVENT: N409 LEVEL: 2 WBS: 2.5.3.1.S RESP: SNL STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 Oct 84	HQ PLANNED:	
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	02 Nov 84	HQ ACTUAL:	

DESCRIPTION: NNWSI Project: Socioeconomic Impacts of Constructing a High-Level Waste Repository at Yucca Mountain

CRITERIA: Added reference for EA.

EVENT: N431 LEVEL: 2 WBS: 2.5.3.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: EA Support - Complete Text Revisions and Response to Public Comments

CRITERIA: EA text revisions relating to repository design will be prepared and submitted to WMPO/NV for inclusion in the final copy of the EA. A letter report will be submitted to WMPO/NV containing recommended text revisions and response to comments.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M502 LEVEL: 1 WBS: 2.5.3.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 Nov 84	HQ PLANNED:	30 Nov 84
NVO EXPECTED:	29 Nov 84	HQ EXPECTED:	29 Nov 84
NVO ACTUAL:	29 Nov 84	HQ ACTUAL:	29 Nov 84

DESCRIPTION: Draft Environmental Assessment (Camera ready)

CRITERIA: This deliverable will be satisfied by the transmittal of a camera ready copy of the draft EA to DOE/HQ (and concurrently to WMPO/NV). Although the issuance of a draft EA for public review and comment is not required under the NWPA, DOE/HQ in conjunction with the various DOE waste management project offices decided that issuance of a public draft was in the public interest. Draft EA provides a description of a) the evaluation of site suitability for characterization under the general siting guidelines; b) the evaluation of site suitability for development as a repository under each guideline that does not require site characterization as a prerequisite for application; c) the environmental setting at Yucca Mountain as it exists now; d) the proposed site characterization activities and an evaluation of the effects of such activities on the public health and safety and the environment; e) the assessment of the regional and local impacts of locating the proposed repository at the site; f) a description of the decision process by which the site was recommended; and g) a comparative evaluation of the site with other sites that have been considered.

EVENT: M503 LEVEL: 1 WBS: 2.5.3.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	30 May 85	HQ PLANNED:	30 May 85
NVO EXPECTED:	29 Aug 85	HQ EXPECTED:	29 Aug 85
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: EA Comment/Response Document

CRITERIA: Following public release of the draft EA, public hearings will be held to solicit public and agency comments. Both oral and written comments received at the public hearings and written comments received during the 90 day comment period will be compiled, categorized and addressed in a EA comment/response document. This document will be prepared in conjunction with the final EA, and will identify how each comment has been addressed and indicate if any corresponding text changes have been made in the final EA. This document will be transmitted to DOE/HQ on May 30, 1985, and released publicly on June 20, 1985.

EVENT: M504 LEVEL: 1 WBS: 2.5.3.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	20 Jun 85	HQ PLANNED:	20 Jun 85
NVO EXPECTED:	10 Oct 85	HQ EXPECTED:	10 Oct 85
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Final Environmental Assessment

CRITERIA: The NWPA mandates that the recommendation of a site by the Secretary of Energy to the President for site characterization be accompanied by an Environmental Assessment (EA) which includes a detailed statement of the basis of such a recommendation, an evaluation of site suitability for characterization and repository development, an assesment of the effects of site characterization and repository development on the public health and safety and the environment, and a comparative evaluation of the site with other sites that have been considered. The final EA will be based on the draft EA released for public review and comment on December 20, 1984, but may include further analysis conducted in the intervening months and revisions as the result of public comments. The issuance of the final EA is considered a final agency action subject to judicial review. Lastly, the final EA will provide the basis for Environmental Impact Statement (EIS) studies plan, should Yucca Mountain be selected for site characterization.

EVENT: M523 LEVEL: 1 WBS: 2.5.3.1.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	29 Jun 84	HQ PLANNED:	01 Aug 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Mar 85	HQ ACTUAL:	06 Mar 85

DESCRIPTION: NNWSI Project References for EA Complete

CRITERIA: This deliverable will be met by receipt of all references cited in the EA and supporting appendicies. A complete bibliography will be developed, the completion of which will be documented by a letter to NNWSI QA.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M530 LEVEL: 2 WBS: 2.5.3.3.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	31 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Preliminary Environmental Compliance Plan

CRITERIA: The Preliminary Environmental Compliance Plan will be prepared and outline activities necessary to ensure that all appropriate NNWSI Project actions, decisions, and documentation are in accordance with applicable requirements of responsible agencies, the NWPA, and OCRWM. Recommendations will be supported by data, analyses and conclusions as required. Key elements of this Plan include an assessment of historical environmental data for use in satisfying identified regulatory requirements, the identification of data deficiencies and plans to resolve these deficiences through field studies and/or literature review, identification of all environmental documentation and permit requirements of responsible agencies, schedules for the execution of identified activities, and outlines for each required document. This deliverable will be met by submittal of the Plan to WMPO/NV for review and comment.

EVENT: M519 LEVEL: 2 WBS: 2.5.3.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	15 Apr 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Apr 84	HQ ACTUAL:	

DESCRIPTION: Plan to Evaluate Socioeconomic Impact

CRITERIA: This deliverable will be met by submission of a draft plan to the WMPO/NV. This plan will include (1) a socioeconomic impact issue review plan that extends beyond the nomination EA; (2) a socioeconomic impact assessment plan, data gathering plans, plans to assess available analytic tools for use in economic impact studies; and (3) an intergovernmental review plan.

MILESTONE REPORT
SORTED BY WBS_EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M520 LEVEL: 2 WBS: 2.5 4.T RESP: SAIC STATUS: B WMPO RESP: Blanchard

NVO PLANNED:	15 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 May 84	HQ ACTUAL	

DESCRIPTION: Preliminary Draft SCP

CRITERIA: This deliverable will be met by distributing revised SCP material to the TPOs.

EVENT: M613 LEVEL: 2 WBS: 2.6.1.1.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue the revision of the ESF Title II Design for Subcontractor Bid Package

CRITERIA: The updated (revised) subsurface facilities drawings, specifications, and cost estimate have been approved by LANL and WMPO/NV.

EVENT: M642 LEVEL: 2 WBS: 2.6.1.1.A RESP: LANL STATUS: B WMPO RESP: Irby

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue revised Surface Title II Design for ESF

CRITERIA: The updated (revised) surface facilities drawings, specifications, and cost estimate have been approved by LANL and WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: N418 LEVEL: 2 WBS: 2.6.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: NRC/DOE Repository Design Workshop for Exploratory Shaft - Sealing

CRITERIA: This milestone will be met by submitting a letter to WMPO/NV that documents the actual agenda, attendees and action items from the first FY 85 repository Exploratory Shaft - Sealing workshop. This deliverable will be submitted within 10 working days after the conclusion of the workshop.

EVENT: N419 LEVEL: 2 WBS: 2.6.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: NRC/DOE Repository Design Workshop for Exploratory Shaft Test Plan (ESTP)

CRITERIA: This milestone will be met by submitting a letter to WMPO/NV that documents the actual agenda, attendees and action items from the repository Exploratory Shaft Test Plan workshop. This deliverable will be submitted within 10 working days after the conclusion of the workshop.

EVENT: M670 LEVEL: 2 WBS: 2.6.5.2.L RESP: LLNL STATUS: B WMPO RESP:

NVO PLANNED:	08 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	08 Feb 84	HQ ACTUAL:	

DESCRIPTION: Certification of LLNL Input to the Exploratory Shaft Test Plan

CRITERIA: This milestone will be documented by a letter from the TPO-LLNL to the WMPO/NV. This certification will be based on an internal peer review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M168 LEVEL: 2 WBS: 2.6.5.2.S RESP: SNL STATUS: B WMPO RESP:

NVO PLANNED:	15 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Mar 84	HQ ACTUAL:	

DESCRIPTION: Chapter 5 of Exploratory Shaft Test Plan

CRITERIA: This deliverable was met by providing a format and subsequent contents for Chapter 5, Rev. 0 of the ESTP to WMPO/NV in conjunction with SAI and LANL. Chapter 5 contains the rationale for Exploratory Shaft testing based on Performance Assessment needs to determine the isolation and containment ability of the site, and on data needed in the determination of compliance with regulatory requirements of the individual subsystems of a repository in the Topopah Spring Member of Yucca Mountain.

EVENT: M618 LEVEL: 2 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Irby

NVO PLANNED:	25 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	28 Jan 85	HQ ACTUAL:	

DESCRIPTION: WMPO/NV Approve ESTP (Rev 0)

CRITERIA: This milestone will be considered complete when a letter is transmitted to LANL and the ESTP Committee with comments on the ESTP revision 0.

EVENT: M641 LEVEL: 2 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	28 Jun 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Finalize ESTP Committee Input to Subcontractor Bid Package for ESF Construction

CRITERIA: This milestone will be met with a letter from the chairman of the ESTP Committee to the LANL ESF Project Manager. The letter will include test procedures from each principal investigator and technical specifications for the subcontractor's operations, materials, and equipment as they relate to ESF tests. Completion of this milestone requires input by 8/1/84 of approved descriptions from both WMPO/NV and the TPOs for construction-phase tests.

MILESTONE REPORT
SORTED BY WBS.EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M649 LEVEL: 2 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Irby

NVO PLANNED: 03 May 85 HQ PLANNED:
NVO EXPECTED: 30 Sep 85 HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Completion of DOE/NRC Workshop on ESTP

CRITERIA: Completion of this milestone will be documented in a letter to WMPO/NV from the ESTP Committee Chairman.

EVENT: M660 LEVEL: 2 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED: 21 Jun 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Submit Draft ESTP (Revision 1) to WMPO/NV

CRITERIA: A draft Exploratory Shaft Test Plan (ESTP) will be revised to incorporate WMPO/NV comments on revision 0 and re-submitted to WMPO/NV for transmittal to OCRWM for their concurrence.

EVENT: M665 LEVEL: 2 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED: 30 Jul 85 HQ PLANNED:
NVO EXPECTED: HQ EXPECTED:
NVO ACTUAL: HQ ACTUAL:

DESCRIPTION: Submit Draft ESTP (Rev 2) to WMPO/NV

CRITERIA: The draft Exploratory Shaft Test Plan (ESTP) will be reviewed to incorporate the results of DOE/NRC workshop and OCRWM review of Rev. 1. The ESTP (Rev 2) will be submitted to WMPO/NV for review and approval.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M666 LEVEL: 1 WBS: 2.6.9.1.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	20 Sep 85	HQ PLANNED:	27 Sep 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue Exploratory Shaft Test Plan (ESTP) (NVO-244)

CRITERIA: This milestone will be considered complete when the ESTP is delivered to DOE/HQ. Prior to submittal to WMPO/NV, LANL will incorporate WMPO/NV comments on Rev. 2 of the ESTP (milestone M665).

EVENT: M140 LEVEL: 2 WBS: 2.6.9.1.S RESP: SNL STATUS: B WMPO RESP: Irby

NVO PLANNED:	30 Aug 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Letter Report on Performance Assessment Activities in Support of the ESTP Input

CRITERIA: This deliverable will be met by submitting a letter report to WMPO/NV. Performance Assessment guidance for and input to Chapter 5 rewrites of the ESTP will be provided as requested. The strategy for focusing Exploratory Shaft test data in assessing compliance with the performance measures long-term isolation and containment and a summary of the results of the data prioritization study will be the minimal input.

EVENT: N453 LEVEL: 2 WBS: 2.6.9.2.S RESP: SNL STATUS: B WMPO RESP: Irby

NVO PLANNED:	13 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Geomechanical Input Complete for Exploratory Shaft Test Plan (Coordination with LANL)

CRITERIA: This milestone will be met by the delivery of all geomechanical test plan input, including incorporation of WMPO/NV comments to the Exploratory Shaft Test Plan coordinator (LANL), so that the Test Plan can be released to DOE/HQ by 9/30/85.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M661 LEVEL: 2 WBS: 2.6.9.3.A RESP: LANL STATUS: B WMPO RESP: Witherill

NVO PLANNED:	30 Sep 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Issue Draft Report on Final Hardware Design for the IDS to WMPO/NV for Review and Comment

CRITERIA: A draft report on the final hardware design for the IDS will be submitted to the WMPO/NV. The document will include drawings, specifications, and cost estimates for the hardware portion of the IDS.

EVENT: M700 LEVEL: 2 WBS: 2.7.1.L RESP: LLNL STATUS: B WMPO RESP: Kunich

NVO PLANNED:	04 Oct 83	HQ PLANNED:	
NVO EXPECTED:	30 Nov 83	HQ EXPECTED:	
NVO ACTUAL:	04 Oct 83	HQ ACTUAL:	

DESCRIPTION: Termination of Acquisition of Test Data - SFT-C

CRITERIA: This milestone will be documented by a letter from the TPO-LLNL to the WMPO/NV.

EVENT: M701 LEVEL: 1 WBS: 2.7.1.L RESP: LLNL STATUS: B WMPO RESP: Kunich

NVO PLANNED:	28 Sep 84	HQ PLANNED:	28 Sep 84
NVO EXPECTED:	31 Oct 84	HQ EXPECTED:	
NVO ACTUAL:	29 Jun 84	HQ ACTUAL:	28 Sep 84

DESCRIPTION: Termination of Routine Access and LLNL Support to Spent Fuel Test - Climax Facility

CRITERIA: This milestone will be documented by a letter from the TPO-LLNL to WMPO/NV. (Verbal completion from M. Kunich 12/6/84)

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M702 LEVEL: 2 WBS: 2.7.1.L RESP: LLNL STATUS: B WMPO RESP:

NVO PLANNED:	28 Feb 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	28 Feb 84	HQ ACTUAL:	

DESCRIPTION: Interim Report on the Results of the Technical Measurements Program During FY 1983

CRITERIA: This deliverable will be met with submission of a draft report to the WMPO/NV. This is the fourth in a series of interim reports which summarize the principal findings and present representative test data obtained to date.

EVENT: M706 LEVEL: 1 WBS: 2.7.1.L RESP: LLNL STATUS: B WMPO RESP: Kunich

NVO PLANNED:	28 Sep 84	HQ PLANNED:	15 Oct 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	06 Jul 84	HQ ACTUAL:	06 Jul 84

DESCRIPTION: Complete Decision Analysis on Use of Climax Facility

CRITERIA: This milestone will be documented by a letter from the TPO-LLNL to the WMPO/NV. (Updated complete per M.P. Kunich verbal direction on 12/6/84. See ltr WMPO:AJR-885 dtd 7/6/84.)

EVENT: M707 LEVEL: 2 WBS: 2.7.2.1.L RESP: LLNL STATUS: B WMPO RESP: Kunich

NVO PLANNED:	30 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Oct 84	HQ ACTUAL:	

DESCRIPTION: Documentary Film on the SFT-C

CRITERIA: This deliverable will be met with submission of copies of the 16mm film documentary. This is a revision and update of the first documentary. Copies of the film will be distributed to the U.S.DOE and foreign nuclear research agencies in accordance with guidelines from the WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M708 LEVEL: 1 WBS: 2.7.2.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED: 31 Aug 85
NVO EXPECTED:
NVO ACTUAL:

HQ PLANNED: 30 Sep 85
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: Final Report on the SFT-C

CRITERIA: This deliverable will be met with the submission of a draft report to the WMPO/NV. A final report on the test will present the significant engineering and scientific findings in the context of the test objectives. Salient findings of previous topical and periodic reports will be distilled and the most recent interpretations of data will be provided. This report will be in the UCRL 50000 format.

EVENT: M941 LEVEL: 2 WBS: 2.9.1.1.L RESP: LLNL STATUS: B WMPO RESP: Kunich

NVO PLANNED: 15 Nov 84
NVO EXPECTED:
NVO ACTUAL: 28 Nov 84

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: LLNL Work Plan

CRITERIA: This deliverable will be met by submission of a detailed work plan to WMPO/NV. This plan is being developed at the direction of WMPO/NV.

EVENT: M917 LEVEL: 2 WBS: 2.9.1.1.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED: 15 Dec 84
NVO EXPECTED:
NVO ACTUAL: 14 Dec 84

HQ PLANNED:
HQ EXPECTED:
HQ ACTUAL:

DESCRIPTION: SNL Input to the NNWSI Project Work Plan

CRITERIA: This milestone will be met by the submittal of SNL input to the NNWSI Project Work Plan to SAIC and WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: N454 LEVEL: 2 WBS: 2.9.1.1.S RESP: SNL STATUS: B WMPO RESP: Kunich

NVO PLANNED:	15 Apr 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: SNL Contribution to the FY85 NNWSI Project Mid-Year Review

CRITERIA: The milestone will be completed by SNL participation in the mid-year review conducted by DOE/HQ. Preliminary submittal of viewgraphs and financial data detailing program status will occur prior to the review. The milestone will be considered to be met by sumittal of a letter to WMPO/NV documenting the extent of SNL participation and the action items for SNL that come from the review.

EVENT: M901 LEVEL: 1 WBS: 2.9.1.1.T RESP: SAIC STATUS: B WMPO RESP: Vieth

NVO PLANNED:	15 Feb 85	HQ PLANNED:	15 Mar 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	08 Jan 85	HQ ACTUAL:	09 Jan 85

DESCRIPTION: Submit FY 85 NNWSI Project Plan to DOE/HQ for Approval

CRITERIA: This Milestone will be met by submitting a draft NVO report to DOE/HQ for approval. The plan shall be prepared by SAIC as a draft NVO-196 series document. Upon approval from DOE/HQ, the document will be published and distributed to the NNWSI Project distribution list and widely to Project participants.

EVENT: M201 LEVEL: 2 WBS: 2.9.1.L RESP: LLNL STATUS: B WMPO RESP: Valentine

NVO PLANNED:	29 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	29 Jun 84	HQ ACTUAL:	

DESCRIPTION: Mission Plan Revision

CRITERIA: This deliverable will be met by submission of rewritten draft of waste package sections to Weston, and comments on Weston drafts of other sections. Request from Weston to provide technical review and rewrite support.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M900 LEVEL: 2 WBS: 2.9.1.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	15 Jun 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jun 84	HQ ACTUAL:	

DESCRIPTION: Draft FY 1984 Project Plan

CRITERIA: This deliverable will be met by submission of a draft FY 1984 Project Plan to the WMPO/NV. The Project Plan is required by DOE Order 5700.4. The Project Plan serves as the overall project baseline and includes specific objectives; major milestones; resource estimates that are sufficient for project control purposes; acquisition strategy; environmental safety, and health requirements and schedules; etc.

EVENT: M906 LEVEL: 2 WBS: 2.9.1.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	28 Sep 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jun 84	HQ ACTUAL:	

DESCRIPTION: NNWSI Administrative Procedures Manual

CRITERIA: This deliverable will be met by submission of draft procedures to WMPO/NV, for review and approval as the procedures are developed. Initially, a three-ring binder with a cover will be issued in which to house the procedures. The Administrative Procedures Manual is to serve the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. It contains procedures affecting NNWSI Project control and administration that are binding to all NNWSI Project participants.

EVENT: M907 LEVEL: 1 WBS: 2.9.1.T RESP: WMPO STATUS: B WMPO RESP: Kunich

NVO PLANNED:	15 Mar 85	HQ PLANNED:	29 Mar 85
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	20 Mar 85	HQ ACTUAL:	

DESCRIPTION: Draft Project Management Plan

CRITERIA: This deliverable will be met by submission of a draft Project Management Plan to WMPO/NV. The Project Management Plan is required by DOE Order 5700.4.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M950 LEVEL: 2 WBS: 2.9.1 T RESP: SAIC STATUS: B WMPO RESP: Kunich

NVO PLANNED:	15 Jan 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	15 Jan 85	HQ ACTUAL:	

DESCRIPTION: NNWSI Project Administrative Procedures Manual

CRITERIA: This deliverable will be met by submissions of a final draft of the Administrative Procedures Manual (APM) from SAIC to WMPO/NV for review and implementation. The procedures will be placed in a loose-leaf binder which will be properly identified on the cover as the APM.

EVENT: N456 LEVEL: 2 WBS: 2.9.2.S RESP: SNL STATUS: B WMPO RESP: Skousen

NVO PLANNED:	15 Mar 85	HQ PLANNED:	
NVO EXPECTED:	15 Apr 85	HQ EXPECTED:	
NVO ACTUAL:	08 Apr 85	HQ ACTUAL:	

DESCRIPTION: SNL WPAS Submittal

CRITERIA: The milestone will be met by submital of SNL input to the NNWSI Project WPAS. It will identify work planned and funding required in Repository and Performance Assessment WBS work areas for FY86 through FY91. A brief synopsis of the status of work in each area will also be provided.

EVENT: M938 LEVEL: 2 WBS: 2.9.2.T RESP: SAIC STATUS: B WMPO RESP: Kunich

NVO PLANNED:	28 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	22 May 85	HQ ACTUAL:	

DESCRIPTION: Draft Work Breakdown Structure (WBS) Dictionary Submitted for Review

CRITERIA: This milestone will be completed when a draft WBS Dictionary has been submitted to DOE/NV for review and approval. The Dictionary will be consistent with the OCR WBS Dictionary and contain definitions for the NNWSI Project WBS to the Planning and Scheduling (P&S) Account level as provided by P participants. Completion of this milestone is therefore subject to submittal of appropriate definitions from each Project participant in a timely manner.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 96
04 June 85

EVENT: M918 LEVEL: 2 WBS: 2 9 3 A RESP: LANL STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	15 Mar 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Updated Quality Assurance Procedures for the NNWSI Project at LANL

CRITERIA: LANL will revise and update the Quality Assurance procedures for the NNWSI Project at Los Alamos. These procedures will be submitted to SAIC and WMPO/NV when they have been completed.

EVENT: M909 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Kunich

NVO PLANNED:	31 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 Oct 84	HQ ACTUAL:	

DESCRIPTION: Submit T&MSS QAPP (Rev 2) to WMPO/NV

CRITERIA: Submittal of draft QAPP, Rev. 2 to WMPO/NV for review and comment will signify satisfaction of the milestones.

EVENT: M910 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	15 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	13 Mar 85	HQ ACTUAL:	

DESCRIPTION: Submit T&MSS QPs Revision 1

CRITERIA: Submittal of Rev 1 of the draft T&MSS QA procedures to WMPO/NV for review and approval signifies completion of this milestone.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M912 LEVEL: 2 WBS: 2 9 3 T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	28 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: NNWSI Project QAP (NVO-196-17) Implementing Procedures

CRITERIA: This milestone will be considered complete when final drafts of all implementing procedures are sent to WMPO/NV for approval and distribution.

EVENT: M915 LEVEL: 1 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	01 Nov 84	HQ PLANNED:	30 Nov 84
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Nov 84	HQ ACTUAL:	30 Nov 84

DESCRIPTION: Submit NVO-196-18 (Rev. 2) NNWSI Project Quality Assurance Program Plan and Implementing Procedures to DOE/HQ for Approval

CRITERIA: This deliverable will be considered complete by submitting NVO-196-18 (Rev. 2) as approved by QAD/NV and WMPO/NV to DOE/HQ for review and approval. The document shall be prepared by SAIC and provided to HQ for approval concurrent with submittal to NV technical information review. Upon QAD and WMPO approval, the document will be issued internally to WMPO/NV and to appropriate SAIC personnel. Upon HQ and technical information review and approval, the document will be published and distributed to the NNWSI Project list. (Updated per verbal statement from Blaylock, WMPO/NV 12/10/84)

EVENT: M928 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	31 Oct 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Oct 84	HQ ACTUAL:	

DESCRIPTION: Annual Status Report of NNWSI Project QA Program

CRITERIA: This milestone will be considered complete when the status report is prepared and submitted to WMPO.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M934 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	20 Feb 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:		HQ ACTUAL:	

DESCRIPTION: Records Management Procedure (SOP-17-01)

CRITERIA: *This milestone will be considered complete when the draft procedure is prepared and submitted to* WMPO for review and approval.

EVENT: M952 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	30 Apr 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	30 Apr 85	HQ ACTUAL:	

DESCRIPTION: NNWSI Project QAP (NVO-196-17) Review (Semi-annual)

CRITERIA: The NNWSI Project QAP and implementing procedures will be reviewed on a semi-annual basis to determine if revision is necessary due to changes in regulations, standards, or requirements imposed by other authoritative sources such as DOE/OGR. The review will be documented in a report which includes the QASC's recommendations regarding changes to the document. This milestone will be considered complete when the report has been submitted to WMPO/NV.

EVENT: M962 LEVEL: 2 WBS: 2.9 3.T RESP: SAIC STATUS: B WMPO RESP: Blaylock

NVO PLANNED:	31 May 85	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	31 May 85	HQ ACTUAL:	

DESCRIPTION: WMPO QAPP (NVO-196-18) Review (Semi-annual)

CRITERIA: The WMPO QAPP and implementing procedures will be reviewed on a semi-annual basis to determine if they need to be revised to meet requirements imposed by NVO-196-17 or to establish more effective methods for implementing the QA requirements. The review will be documented in a report which includes recommended changes to the QAPP and/or procedures This milestone will be considered complete when the report has been submitted to WMPO/NV.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M972 LEVEL: 2 WBS: 2.9 3.T RESP: SAIC STATUS B WMPO RESP: Kunich

NVO PLANNED:	31 Oct 84	HQ PLANNED.
NVO EXPECTED:		HQ EXPECTED.
NVO ACTUAL:	30 Oct 84	HQ ACTUAL:

DESCRIPTION: Recommended Tentative Quality Assurance Surveillance Schedule

CRITERIA: This milestone will be considered complete when the tentative schedule is submitted to WMPO/NV for review and approval.

EVENT: M978 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Kunich

NVO PLANNED:	31 Oct 84	HQ PLANNED.
NVO EXPECTED:		HQ EXPECTED:
NVO ACTUAL:	15 Oct 84	HQ ACTUAL:

DESCRIPTION: Recommended Tentative Quality Assurance Audit Schedule

CRITERIA: This milestone will be considered complete when the tentative schedule is sent to WMPO/NV for review and approval.

EVENT: M989 LEVEL: 2 WBS: 2.9.3.T RESP: SAIC STATUS: B WMPO RESP: Kunich

NVO PLANNED:	31 Dec 84	HQ PLANNED:
NVO EXPECTED:		HQ EXPECTED.
NVO ACTUAL:	07 Nov 84	HQ ACTUAL:

DESCRIPTION: Assignment of Quality Levels (SOP-02-02) (Draft)

CRITERIA: This milestone will be considered complete when the draft procedure is prepared and sent to WMPO/NV and the NNWSI Project participants for review.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M911 LEVEL: 2 WBS: 2 9.4.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	01 May 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	08 Mar 84	HQ ACTUAL:	

DESCRIPTION: Revise NNWSI Quality Assurance Plan, NVO-196-17, Rev 1

CRITERIA: This milestone will be considered complete when a final draft, which incorporates WMPO/NV comments, has been transmitted to the director WMPO/NV for approval.

EVENT: M927 LEVEL: 2 WBS: 2.9.4.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	26 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED:	
NVO ACTUAL:	26 Mar 84	HQ ACTUAL:	

DESCRIPTION: QA Manual (NVO-196-18) List of Implementing Procedures

CRITERIA: This milestone will be complete when the proposed list of implementing procedures is transmitted to WMPO/NV for review and approval.

EVENT: M928 LEVEL: 2 WBS: 2.9.4.T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	19 Sep 84	HQ PLANNED:	
NVO EXPECTED:	28 Sep 84	HQ EXPECTED:	
NVO ACTUAL:	10 Aug 84	HQ ACTUAL:	

DESCRIPTION: Revise NVO-196-18, Rev. 1, WMPO/OASC QAPP

CRITERIA: This milestone will be considered complete when a final draft of the document, which incorporates WMPO/NV comments, has been transmitted to WMPO/NV for approval.

MILESTONE REPORT
SORTED BY WBS,EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

EVENT: M930 LEVEL: 2 WBS: 2 9 4 T RESP: SAIC STATUS: B WMPO RESP:

NVO PLANNED:	28 Mar 84	HQ PLANNED:	
NVO EXPECTED:		HQ EXPECTED	
NVO ACTUAL:	28 Mar 84	HQ ACTUAL:	

DESCRIPTION: Provide WMPO/NV with a Surveillance Plan and a Surveillance Procedure

CRITERIA: This milestone will be considered complete with the transmittal of a draft surveillance procedure for approval.

Baselined Milestones thru FY86

MILESTONE REPORT
SORTED BY WBS.EVENT AND SCHEDULE DATE
BETWEEN 01 Jan 80 AND 30 Sep 86
04 June 85

TOTAL ROWS IN THIS REPORT: 297