



## Department of Energy

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### Distribution

### IMPACTS OF FISCAL YEAR 2003 BUDGET ACTIONS ON THE YUCCA MOUNTAIN PROJECT

Between February and May of this year, the Yucca Mountain Project initiated a major replanning effort to align the project to the fiscal year 2003 budget. The enclosed paper summarizes the replanning effort we undertook and its impacts that resulted from the extended continuing resolution at the beginning of fiscal year 2003 and the final appropriation, which was significantly below our budget request.

Our replanning effort was based on the following priorities: maintaining a safe working environment; developing, on an achievable schedule, a license application for submittal to the U.S. Nuclear Regulatory Commission that meets its requirements; and ensuring the defensibility of the Project's technical products.

Although we still believe we can submit a license application in 2004, there are significant impacts. These include: deferral of field tests; delays in starting transportation activities; partial closure of the Yucca Mountain site facilities; significant reductions in overhead expenses; and rescheduling of repository design activities.

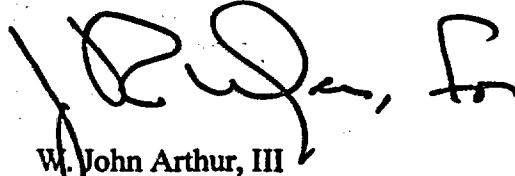
The Project also took advantage of the replanning process to develop a more effective approach for addressing the remaining Key Technical Issue agreements with the U.S. Nuclear Regulatory Commission. This approach "bundles" several agreements into technical groupings resulting in a more comprehensive system view.

The key period for success of this new plan is the remaining three months of this fiscal year and the first six months of fiscal year 2004. During this critical period, technical, scientific, and design work must be completed to allow time to compile the license application document for submittal to the U.S. Nuclear Regulatory Commission. If the Program receives its full budget request at the start of 2004, the plan could still be executed. However, if the 2004 Appropriation is below the Program's budget request or if there is a lengthy continuing resolution, there would be a significant risk that the license application would not be ready for submittal by December of 2004 and the Project could be forced to initiate shutdown of additional site activities and reevaluate other project work.

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Thank you for your interest in this important national endeavor. Please feel free to contact either Victor W. Trebules, Jr., at (702) 794-5429, or J. Russell Dyer or me at (702) 794-1300 if you have any questions.



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OPC&M:VWT-1451

Enclosures:

1. Yucca Mountain Project Replan Effort and Impacts
2. Fiscal Year 2003/2004 Baseline YMP Field Testing with Customers, Impacts, and Schedule

## YUCCA MOUNTAIN PROJECT REPLAN EFFORT AND IMPACTS

### OVERVIEW

This paper summarizes the Yucca Mountain Project replanning effort to realign the Project to operate within a FY 2003 appropriation well below our planned level. At the same time we maximized our potential to achieve our two primary objectives: to produce a license application by December 2004 and to initiate waste shipments in 2010. We conducted an in-depth review of the baseline plan to identify 1) work that does not directly support the license application and could be deferred, eliminated, or reduced to address a \$130M shortfall, 2) work that had to be added to address emerging issues, and 3) work that should be combined for greater efficiency. These priorities guided our review:

- **Maintain a safe working environment for all employees and visitors**
- **Develop and submit a license application that will be successfully docketed and will facilitate a three-year Nuclear Regulatory Commission (referred to as the Commission hereafter) licensing review**
- **Ensure the defensibility of the Project's technical products**

To maximize our long-term success, we preserved milestones needed to initiate spent nuclear fuel and high-level radioactive waste shipments in 2010, maintained our safety infrastructure, and remained committed to completion of vital scientific tests needed to produce a quality license application, including seepage, conductivity, and moisture monitoring tests. In addition, we:

- **Added new work to address emerging issues.** This work is designed to resolve volcanism issues, increase the robustness of the license application, and fund licensing support network activities.
- **Bundled Key Technical Issues** to more efficiently and effectively respond to agreements made with the Commission. While we had already intended to do this, the replan provided a vehicle for implementing for this change.

Nevertheless, the replan resulted in specific impacts identified below. Although none of them are on the critical path (that is, none of them are required for our primary objectives), they increase our risk of achieving – by 2004 – the quality license application we intend to produce.

- **Deferral or elimination of new field tests.** Delay in these tests, which DOE intended to be confirmatory, adds to the risk in defending our license application after submittal.
- **Delay in starting the Transportation Project** increases the risk that the transportation infrastructure will not be in place to support waste shipments once a license application is received.
- **Partial closure of Yucca Mountain site facilities** to reduce the accessible portions of the Exploratory Studies Facility and maintain our commitment to safety in the accessible parts of the Facility.

- **Significant reduction of general support and administration.** The reduction included downsizing the amount of Information Technology and Project Control support to the Project; and reductions to other supporting functions.
- **Reduction of Project contingency will limit the Project's ability to mitigate risks.**

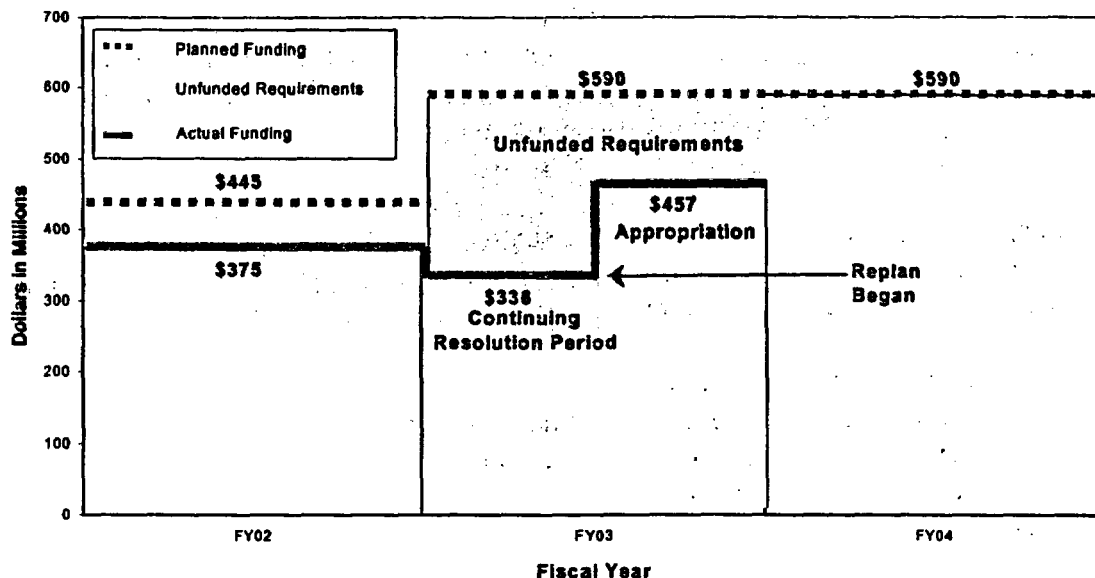
We define success as production of a high-quality license application. Success of this plan depends on completion of the remaining technical, scientific, and design work in the last three months of this fiscal year and the first six months of FY 2004 to allow time to compile the license application for submittal to the Commission. If the Program receives its full FY 2004 budget request at the start of FY 2004, this revised plan can be executed. However, a continuing Resolution at the start of FY 2004 at the same level as this year, or a FY 2004 appropriation below the Program's budget request would significantly increase the risk that a license application will not be ready for submittal to the Commission by December 2004.

### IMPACT OF FY 2003 CONTINUING RESOLUTION AND FINAL APPROPRIATION

During FY 2002, the Office of Civilian Radioactive Waste Management and the YMP operated with an appropriation of \$375M. For planning purposes, we developed a "baseline" plan tied to the Program's budget requests of \$590M for both FY 2003 and FY 2004. The key near-term milestone of this plan was the submittal of the license application to the Commission in December 2004.

At the beginning of FY 2003, we operated under a continuing resolution at the funding level the Senate proposed of \$336M – nearly \$40M below the FY 2002 appropriation level – until February 20, 2003, nearly five months into the fiscal year. The actual appropriation for FY 2003 was \$457M, more than \$130 million below the Program's budget request. These figures are presented in the graph below, showing the unfunded requirements that forced the replan.

Impact of FY03 Continuing Resolution and Final Appropriation



## **REQUIREMENT TO REPLAN**

The result of the extended FY 2003 continuing resolution and the reduced appropriation necessitated a replanning of the YMP work scope for the five-year baseline period. The Department of Energy (DOE) and its Management and Operating contractor (Bechtel/SAIC, referred to as the Contractor hereafter) initiated this effort during the continuing resolution period. The DOE directed the Contractor to take all actions necessary to perform within the limited funds being made available. Also, during this time the DOE did not provide money to the states and counties, since the money had not been authorized by Congress.

When we received the FY 2003 appropriation, more than 20 percent below our request, at the end of February 2003, it became clear that all work scope in the baseline plan could not be executed as scheduled, and the work had to be replanned.

The YMP continued its critical review of spending to limit new financial commitments, contracts, travel, training, conferences, etc. The DOE requested the Contractor to conduct a critical, in-depth review of the baseline plan to reduce or defer work that does not directly support the license application based on the following priorities:

- Maintain a safe working environment for all employees and visitors.
- Develop a license application to be submitted that will be successfully docketed and will facilitate a three-year licensing review by the Commission.
- Ensure the defensibility of the Project's technical products by developing and maintaining the validity, reproducibility and retrieveability of data, information, and processes used to prepare those products.

## **REPLAN PROCESS**

In performing this review, the DOE invited the Contractor to recommend new approaches that could satisfy DOE's priorities even with significant budget reductions. The DOE recognized that Project participants, including contractors, the National Laboratories, and the U.S. Geological Survey needed to work together to develop recommendations for areas of work that could be deferred or reduced without compromising the quality and docketability of the license application. In particular, the DOE directed that a risk-based approach should be used to meet the requirements and budget and schedule constraints.

The Contractor responded in early March with a summary level strategy based on the revised funding targets. In its response, the Contractor used the following priorities for evaluating the work that could be deferred, eliminated or reduced.

1. Safety and security of personnel and material
2. Compliance with contractual commitments and requirements
3. Work in support of submitting a license application
4. Non-license application support work
5. Discretionary work

The Contractor cautioned, however, that the submittal date of the license application to the Commission in December 2004 had taken on a significantly higher level of schedule risk. The result is parallel critical paths that create significant schedule risk that must be aggressively managed to minimize last minute integration and technical issues.

The DOE request and the initial Contractor response provided the basis for intense interactions over the next two months, during which different options with varying levels of curtailment of site activities were evaluated. The impacts of all these options were carefully evaluated.

#### **REVISED BASELINE PLAN: IMPACTS**

Ultimately, the DOE and the Contractor agreed to implement the planning option to maintain safe operations with limited site access and accommodate the effects of the continuing resolution and the reduced FY 2003 Appropriation. This option reduced previously baselined workscope, held the license application submittal to December 2004, initiated phased reduction in some contractor staff areas, and caused a partial shutdown of site activities. Approximately \$50M out of \$370M of Contractor work at Yucca Mountain is being eliminated in both FY 2003 and FY 2004; the rest of the reduction comes out of transportation and other program activities.

Specific impacts resulting from the replanning effort versus the previous baseline include the following:

- A bow wave of license application work is shifted into the first six months of FY 2004 due to the inability to ramp-up during the continuing resolution and the impacts of the reduced FY 2003 budget appropriation. However, the majority of the scheduled license application work will be accomplished and will be included in the license application.
- There will be a reduction-in-force in Las Vegas of 50 to 70 personnel and approximately 100 more people will be taken off the Project at the National Laboratories from the total of approximately 1,500 employees (approximately 10 percent). The reductions will occur in the July – August time frame.
- The site will be partially closed.
  - Access to the Exploratory Studies Facility will be limited, restricting the accessible portions. The Exploratory Studies Facility will be accessible by rail to the cross-drift turn-off, and accessible by foot beyond for scientific experiments.
  - Passive scientific testing will continue; minimal new testing will be initiated. The ongoing heater test will continue to be monitored through the cool-down phase and ongoing experiments in the Exploratory Studies Facility will continue. Work will continue to develop the pre-repository natural system baseline.
  - The number of tours will be limited and there will not be any open houses for the general public.
- Pre-closure Safety Analysis & Design
  - Extend the completion date for design inputs to the license application.

- Some work scope will be added to resolve the seismic design requirements.
- **Post-closure Safety Performance Assessment**
  - Defer some planned tests. The cross-drift heater test and seepage test will be deferred because they are not necessary for the license application.
  - The design for the license application (subsurface, waste package and engineered barrier system) will be completed in parallel with the Total System Performance Assessment, increasing the schedule risk associated with developing the license application.
  - Ongoing scientific tests will continue.
  - New work scope will be added to resolve data qualification and software issues.
  - Work will continue to address the Key Technical Issue agreements.
  - Work will continue on improving our understanding of the natural system and improving the natural system models and the total system performance.
- **License Application Support**
  - Work scope will be added for the licensing support network contractor. The licensing support network is an electronic discovery support system where millions of Project records are to be made available to participants in the licensing proceedings. We will continue to screen material to be loaded into the licensing support network. The Commission requires the licensing support network to be available six months prior to the license application submittal.
  - Work scope will be added to develop licensing and licensing defense strategies.
  - Support of near-term licensing issues, including stakeholder interactions will increase.
  - Work will continue to write the license application.
  - Emergency Management Strategic Development Plan for Repository Development and Operations will be deferred to FY 2005
- **Management and Integration**
  - Eliminate external support for peer reviews and product reviews
  - Reduce laboratory lead support by 43 percent in FY 2003 and an additional 17 percent in FY 2004
- **Environment, Safety and Health**
  - Reduce support to environmental reclamation and monitoring
  - Reduce support for repository land withdrawal
  - Reduce pollution prevention/waste minimization efforts
- **Information Technology Support**
  - Eliminate expansion of server room and Data Center consolidation
  - Eliminate cyber security internet traffic audits
  - Reduce proficiency training
  - Defer upgrades to databases
  - Reduce support to existing systems and eliminate development of new systems
- **Project Control**
  - Reduce estimating support

- Reduce timeliness for information requests

**REVISED BASELINE PLAN:  
TESTS TO BE CONTINUED AND TESTS TO BE DEFERRED**

In evaluating our testing program, we took care to preserve those tests that will support the licensing basis (see attached table for details) including:

- The Drift-Scale Test
- The alcove 8/Niche 3 Seepage and Tracer Testing
- Thermal Conductivity Testing
- Bulkhead Moisture Monitoring Program
- We also preserved the funding for the Nye County and Inyo County Drilling Programs (sample collection and curation support) because of the value they provide for independent confirmatory data.

Impacts to the scientific testing program include deferral of tests not needed to address the Key Technical Issues or support the licensing basis, and identification of alternate avenues to collect needed data. The attached table provides a high-level summary of the changes to the testing program.

**REVISED BASELINE PLAN:  
BUNDLING OF KEY TECHNICAL ISSUE AGREEMENTS**

Through continued interactions with the Nuclear Regulatory Commission staff, review of the latest draft of the Yucca Mountain Review Plan, and replanning work to support the license application, the Project has developed a more effective approach for resolving the remaining Key Technical Issue agreements. This approach "bundles" several individual agreements into one of 22 technical process groupings. This integrated approach results in a total post-closure system view. Each agreement will be explicitly addressed by the time of license application submittal through technical basis documentation or through a specific plan for closure.

**CONCLUSION**

The key period for success of this new plan is the remaining three months of this FY and the first six months of FY 2004. During this critical period the remaining planned technical, scientific, and design work must be completed to allow time to compile the license application document for submittal to the Commission. If the Program receives its full FY 2004 budget request at the start of FY 2004, this plan can still be executed. However, a continuing resolution at the start of the year at the same level as this year, or a 2004 Appropriation below the Program's budget request would significantly increase the risk that a license application will not be ready for submittal to the Commission by December 2004.



FY03/04 BASELINE YMP FIELD TESTING WITH CUSTOMERS, IMPACTS, AND SCHEDULE

FIELD TESTS	TEST DESCRIPTION	KEY ACTIVITY OR ASPECT OF LICENSING, BARRIER CAPABILITY, OR MODEL ABSTRACTION UNCERTAINTY BEING SUPPORTED	OWNER OF THE RESULTS	WHEN THE EXPERIMENTAL RESULTS ARE EXPECTED TO BE PROVIDED (OR RANGE)	IMPACTS OF SITE CLOSURE RESULTING IN A 2-3 YEAR DELAY
Cross Drift Thermal Test (Alcove 10)	Alcove 10 construction/excavation and associated drilling/coring for thermal test in the lower lithophysal unit. Mapping, data collection, active testing (neutron logs, ERT, GPR, sampling), and video runs.	UZ FLOW, EBS ENVIRONMENT	UZ	BEGIN SPRING '06, COMPLETE SUMMER '06	This test is not directly tied to a KTI. This test is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **). This test is not planned to be conducted under the Option 2 planning scenario.
Crest Alcove (Alcove 9)	Alcove 9 construction/excavation and associated drilling/coring and mapping for planned long-term moisture monitoring activities.	UZ FLOW	UZ	BEGIN SPRING '06, COMPLETE 2016	This test is not directly tied to a KTI. This test is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **). This test is not planned to be conducted under the Option 2 planning scenario.
Niche 6 Seepage Test	Seepage Testing in the lower non-lithophysal unit. Similar test and set-up to Niche 5.	UZ FLOW	UZ	BEGIN FALL '06, COMPLETE 2007	This test is not directly tied to a KTI. This test is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **). This test is not planned to be conducted under the Option 2 planning scenario.
Ground Support Testing	Installation, grouting, pull-testing, and overcoring of rockbolts in the lithophysal rock. Phase I (2 bolts) considered complete before shutdown. Phase II (additional bolts) not complete.	EBS ENVIRONMENT, GROUND SUPPORT DESIGN	SUBSURFACE DESIGN	PHASE I - MAY '03, PHASE II - OCT '03	First phase of the test is expected to be complete by May and would be relatively unaffected by the shutdown. The second Phase of this test (additional bolts and varying grout lengths) is not planned to be conducted under the Option 2 planning scenario would not be available to help support the RDTME KTIs.
Zoilitic Calico Hills Nonwelded Unit Drilling/Coring and Testing	Drilling/coring from Alcoves 6 & 7 to intersect the Ghost Dance Fault in the Calico Hills unit. Installation of downhole packers and/or liners to provide for pneumatic monitoring/gas sampling and for cross-hole air-injection and tracer transport testing, and water-injection testing.	UZ TRANSPORT	UZ	MARCH '06 - DEC '07	This test is not directly tied to a KTI. This test is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **). This test is not planned to be conducted under the Option 2 planning scenario.
Rock Properties Lithophysal Coring	Coring and sampling efforts to provide laboratory specimens for strength versus porosity in the lithophysal units.	EBS ENVIRONMENT	SUBSURFACE DESIGN, EBS	MAY '03 - OCT '03	Data being generated through lab tests will be used to support KTI resolution and ground control design through LA. Data beyond LA will be used by RDF to improve confidence in the databases and reduce levels of uncertainty. No adverse impacts to the KTI resolution or design would result from the shut down provided sufficient samples of host rock exist at the SMF and labs to continue the lab testing.
Radon/Dust Testing in the ESF (Alcove 6)	Construction of a bulkhead and ventilation test system in Alcove 6 to evaluate the excavation methods that minimize dust production, and to evaluate ventilation configurations to assess the possibility of reducing radon levels in underground openings.	EBS ENVIRONMENT, VENTILATION DESIGN	ES&H, SUBSURFACE DESIGN	JUNE '06 - DEC '06	This data is needed in the post-LA period and no adverse impact to LA design would result from the shut-down. However, because of the lead-time required for test implementation, consideration should be given to re-evaluating the test immediately after LA submittal. This test is not planned to be conducted under the Option 2 planning scenario.
Busted Butte - Phase III Work	Field work associated with Phase III work (thermal test) at Busted Butte. (Technical workscope only in baseline.)	UZ TRANSPORT	UZ	SEPT '04 - SEPT '05	This test is a follow-on activity from the Phase I and II portions of the UZ Busted Butte experiments and has since been determined not to be critical to the Program. Therefore, there are no impacts to not fielding this test and it should be deleted in any scenario.
Vapor Transport Testing/Dispersion Testing (Atlas)	Quarter-scale test at the North Las Vegas Atlas facility to test the dispersive transport of water vapor (and the heat it contains) along the axial direction of the main drifts.	EBS ENVIRONMENT	EBS	DEC '03	Currently, no other experimental efforts are underway to address KTIs related to the "Cold Trap Effects" KTI TEF 2.05. The KTI fact sheet that calls for these measurements would be rebid and rewritten to rely on modeling results to address the issue. The modeling in the In-Drift Convection and Condensation Model (MDL-EBS-MD-00001) will help to address this KTI. Alternate lab testing would also help address this issue. This workscope is included in the Option 2 planning scenario, although it is unaffected by the ESF shutdown as it is off-site, uses TCO, testing, and BN services, and could continue if funding was available.
SZ Borehole Workovers	Surface SZ borehole clean-out and pumping for geochemistry samples and Eh/pH measurements.	SZ FLOW AND TRANSPORT	SZ	PHASE I - JUNE '04, PHASE II - JUNE '06	This workscope is unaffected by an ESF shut-down because it is on the surface, uses TCO and testing services for the conduct of the test, and could continue if funding and permits were available. This test is not planned to be conducted under the Option 2 planning scenario. Some KTI fact sheets will need to be revised and alternate lab testing and/or analysis relied upon if this workscope was not conducted.
Alluvial Testing Complex (ATC)	Cross-hole tracer testing in the Nye County ATC.	SZ FLOW AND TRANSPORT	SZ	MAY '04 - JUNE '06	This workscope is unaffected by an ESF shut-down because it is on the surface, uses TCO, Nye County and testing services for the conduct of the test, and could continue if funding and permits were available. Some KTI fact sheets will need to be revised and alternate lab testing and/or analysis relied upon if this workscope was not conducted.
Systematic Hydrologic Characterization of the Cross Drift	Drift scale flow and seepage testing from existing drillholes in the ESF/ECRB.	UZ FLOW	UZ	LAS66 - JULY '03, LAS75 - JULY '04	This is an ongoing test that will be about 60% complete at the time of Option deployment and will need to be delayed until underground Site Ops support is available. The testing is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **).
UCCSN Repository Integrity Monitoring	Underground seismic source to surface recording equipment to evaluate the technology for locating rockfalls and other potential human intrusion scenarios in a post-closure repository.	DE SEISMIC, EBS ENVIRONMENT	DE, UCCSN	JULY '03 - JULY '04	This test is a scoping activity being conducted under the UCCSN by UNLV and no impacts to the LA would be realized by a site shutdown.
Rock Modulus Index Testing	Conduct of an Index test in existing 12" boreholes in the ESF/ECRB using a dilatometer (pressure versus strain) to address spatial variability of rock modulus.	EBS ENVIRONMENT	SUBSURFACE DESIGN, EBS	DEC '03	Data from the test would benefit KTI resolution and support ground control design in adding confidence in design assumptions and parameters. However, not having the data for LA would not adversely impact the KTI resolution or design process. The test can be discontinued during the shut down with no direct impacts.
<b>BELOW THIS LINE = TESTS THAT ARE PLANNED TO BE CONTINUED UNDER THE OPTION 2 SCENARIO - MINIMUM SAFE SITE OPERATIONS WITH LIMITED ACCESS AND SUPPORT</b>					
Drift Scale Test	Drift Scale Heater Test in Alcove 5. Data collection, sampling (neutron logs, ERT, GPR, sampling), video runs, plate loading testing.	UZ FLOW, EBS ENVIRONMENT	UZ	SEPT '03 - JAN '06	This test is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **). If this confirmatory test was stopped, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA.
Alcove 6/Niche 3 Seepage and Tracer Testing	Large-scale flow and transport testing between drift levels within the repository block utilizing tracers having different diffusion coefficients to determine effective diffusion parameters for faults and bulk rock.	UZ FLOW & TRANSPORT	UZ	MAY '04 - MAY '04	This test is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **). If this confirmatory test was stopped, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA.
Thermal Conductivity Testing	Install 2 tests to measure thermal K as a function of formation water content and to assess spatial variability.	EBS ENVIRONMENT	UZ, EBS	CONTINUE THROUGH MAY '04	This test is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **).
Bulkhead Moisture Monitoring Program (ECRB Bulkhead Studies, Alcove 7)	Monitoring of the bulkheaded portion of the ECRB and in Alcove 7 to determine whether natural seepage may occur under ambient conditions. Consists of on-going, low level-of-effort data collection.	UZ FLOW	UZ	CONTINUE THROUGH MARCH '04	This test is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **). If this confirmatory test was stopped, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA.
Moisture Monitoring Program (ESF and ECRB)	Monitor moisture conditions in the ESF and ECRB to evaluate the in-situ water conditions in the drift-walls and drift-headers and measure the effects of ventilation, temperature, and tunnel activity on the in-situ drift moisture conditions.	UZ FLOW	UZ	CONTINUE THROUGH MARCH '04	This test is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **). If this confirmatory test was stopped, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA.
Dust Sampling - Geochemical/Physical Characterization of Dust	Dust sampling in the ESF and ECRB for analysis for major element and trace element compositions.	EBS ENVIRONMENT, WPDS DEGRADATION	EBS	CONTINUE THROUGH 2009	This test is being used to fulfill a DOE requirement for diesel emissions. For use in PA, it is confirmatory and would add additional confidence to the parameter distributions and the conceptual models (see NOTE **). Work has been used to help address KTI ENFE 2.04 and 2.13 in providing a technical basis for bounding trace elements and fluoride that affect the WP and DS.
UNR/UCSD Laser Strain Meter	Operation and maintenance of the South Ramp Laser Strain Meter for tectonic strain/seismic hazard data collection.	EBS ENVIRONMENT	EBS, UCCSN	CONTINUE THROUGH 2016	This test is being conducted under the UCCSN and the data is not being directly used in any LA products. No impacts to the LA would be realized by implementation of Option 2. Some information has already been gathered, and the testing can be reinitiated if deemed necessary in the future.
USBR Fracture and Lithophysal Studies	Small scale fracture studies, lithophysal porosity studies, and fracture and fault relationship studies. (Mapping and photos)	EBS ENVIRONMENT, WPDS DEGRADATION	SUBSURFACE DESIGN, EBS	CONTINUE THROUGH SEPT '03	This testing is a part of the geomechanical testing program to help address the RDTME KTIs. At this point, this testing is confirmatory and adds additional confidence to the parameter distributions and the conceptual models (see NOTE **). If this confirmatory test was stopped, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA. This testing is planned to continue during Option 2 implementation.
Construction Monitoring	Bi-annual readings of drift convergence to demonstrate drift stability under ambient conditions and after seismic events. Installation of 301X stations.	SITE OPERATIONS	SITE OPERATIONS, ES&H	CONTINUOUS	None. This data supports the safe operation of the facilities and there would be no impact if the test were discontinued during a shut down. The routine monitoring of the ground support system is planned to continue during Option 2 implementation, however, the new installation of gages in the 301X area would be deferred.
AFM Cubic Meter Block Extraction (assumed complete by May 1)	Excavation and transport of cubic meter block from the underground for active fracture matrix investigations.	UZ FLOW & TRANSPORT	UZ	SPRING '04 (LAB)	Excavation of the block is expected to be complete by the time of shutdown. No impacts from implementation of Option 2. The block will be stored at the SMF or at LBNL until lab testing is authorized.
Niche 5 Seepage Test (assumed complete by May 1)	Close-out of Niche 5 Seepage Testing in the lower lithophysal unit. Last phase of testing scheduled for completion mid FY03.	UZ FLOW	UZ	JUNE '03	This test is expected to be complete by the time of implementation of Option and requires little Site Ops support. No impacts.
Nye/Inyo County Drilling Program (sample collection and curation support)	Drilling and sampling programs to establish entry boreholes around the site boundaries and down gradient of flow paths. Consists of YMP sample collection and geochemical analyses.	SZ FLOW & TRANSPORT	SZ	JUNE '03 - JUNE '06	No impacts from implementation of Option 2. The test is off-site and would continue providing limited SMF and TCO-support were maintained.
Meteorological Monitoring	Surface meteorological, climate, and air quality monitoring.	BIOSPHERE, SZ TRANSPORT	BIOSPHERE, SZ	CONTINUOUS	This workscope would be unaffected by implementation of Option 2 because it is on the surface, uses only TCO and ES&H services to conduct the test, and could continue.
UNR Seismic Monitoring	Operation and maintenance of the Southern Great Basin Digital Seismic Network. (Underground station in Alcove 5 is assumed lost in ESF shutdown scenario.)	DE SEISMIC, EBS ENVIRONMENT	SITE OPERATIONS, DE, UCCSN	CONTINUOUS	The seismic stations on the surface would be unaffected by implementation of Option 2 providing the TCO and UNR establish data loggers to collect the data as opposed to the fiber optic services on the pad. The underground stations in Alcove 5 and planned for the South Ramp and Cross Drift would be shut-down, however, information has been gathered to date, and the testing can be reinitiated if deemed necessary in the future.
UNLV Groundwater Monitoring	Water level measurements in 30 existing surface SZ boreholes.	SZ FLOW AND TRANSPORT	SZ, UCCSN	CONTINUOUS	This workscope would be unaffected by implementation of Option 2 because it is on the surface, uses TCO and testing services to conduct the test, and could continue.
UNLV Precipitation Monitoring	Precipitation data collection and associated station maintenance from the Tipping Bucket Rain Gauge Network.	BIOSPHERE, UZ FLOW	UZ, BIOSPHERE, SZ, UCCSN	CONTINUOUS	This workscope is unaffected by implementation of Option 2 because it is on the surface, uses TCO and testing services to conduct the test, and could continue.
North Portal Pad Geotechnical Investigations [Proposed Trend]	Geotechnical investigation consisting of additional borehole drilling/sampling and seismic investigations for Repository Facilities.	FACILITIES DESIGN	REPOSITORY DESIGN	LATE '03 - '06	No impacts from implementation of Option 2. Drilling and logging services planned for execution using subcontract services. Work is planned to proceed without Site Operations support providing layout survey and planning is provided to confirm locations of buried utilities on the pad.
Igneous Activity Investigations [Proposed Trend]	Aeromagnetic surveys and surface drilling program to investigate and date potential igneous anomalies.	DE IGNEOUS	DE	JUNE '04 - JUNE '06	This workscope is planned to address NRC RAI IA 1.02, received by the Project in December 2002 and is planned for execution using subcontract services for the drilling and aeromagnetic surveys. If Site Operations support were unavailable, drill pads, associated road construction, and source of drilling water could also be provided by subcontract. Therefore, there would be no impacts from implementation of Option 2 and the test would continue.

NOTES:  
 \* Assuming current level of resources and baseline schedule  
 \*\* The data currently available from these tests listed have been used as the basis for model validations and the development of reasonable parameter ranges used to support TSPA-LA. These models and parameter ranges are being developed and documented in AMRTs to address the relevant YMP acceptance criteria and KTI agreements. The propagation of data parameters and model uncertainty in these AMRTs is commensurate with their risk-informed significance. From this point forward, the additional data were to be confirmatory and would add additional confidence to the parameter distributions and the conceptual models prior to the LA submittal. If these confirmatory tests were not performed, thus eliminating these additional data, it may necessitate more sensitivity analysis of parameter and conceptual model uncertainties beyond the ranges investigated to support the TSPA-LA.

Distribution -- Memorandum dated

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