



U.S. Department of Energy
Office of Civilian Radioactive Waste Management


www.ocrwm.doe.gov

Yucca Mountain Site Operations Update

Presented to:
Nuclear Waste Technical Review Board

Presented by:
Scott A. Wade
Acting Director, Yucca Mountain Site Operations Office

January 24, 2007
Las Vegas, NV

Presentation Outline

- **Site facilities and infrastructure description**
- **Background/history**
- **Exploratory Studies Facility (ESF) facilities current condition and proposed improvement plan**
- **ESF underground systems current condition and improvement plan**
- **Support utilities (water, roads, power, communication) current condition and improvement plan**



Yucca Mountain Site Facilities and Infrastructure

- **Site facilities and infrastructures include:**
 - **Approximately eight miles of ESF tunnel and support utilities systems (water, power, sewer, ventilation, communication, fire detection and alarm system, underground rail transportation, etc.)**
 - **Facilities at both ESF north and south portals**
 - **Site support utilities (water, roads, power, etc.)**
 - **Central support area facilities (sample management facility, fueling station)**
 - **Boreholes, trenches, test facilities**



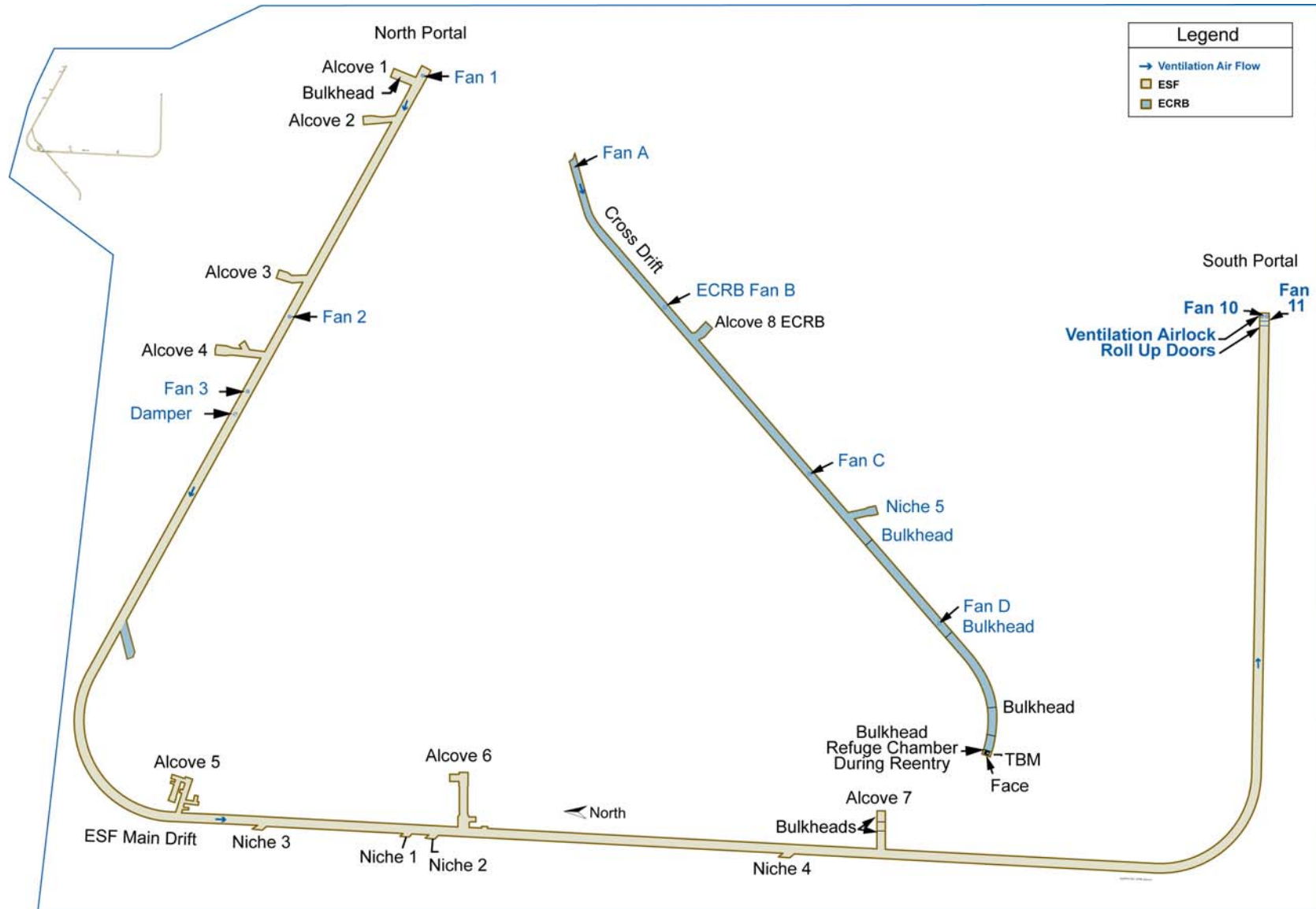
General Condition of Site Infrastructure

- **Background**

- **Field activities and tunnel construction occurred from 1993 to 1998**
- **Expected time of use of the facilities was 5 to 10 years**
- **As-constructed configuration favored over designed systems and structures**
- **Existing Nevada Test Site utilities (electric power, water), infrastructure (roads, buildings) used without upgrades**



Underground Layout



General Site Infrastructure Condition

(Continued)

- **Current outlook**
 - **Site current mission to extend for another 5+ years for a total life of 15+ years**
 - **Systems are aging and degrading**
 - **System documentation detail varies**
- **Risk management approach**
 - **Assessments were conducted on each system in 2004-2005**
 - **System routine and preventative maintenance prioritized**
 - **Safety mitigations instituted to ensure safe envelope of operations**



Current ESF Site Facilities



North portal facilities

- **Two permanent structures**
- **121 temporary structures**
 - Trailers
 - Cargo containers
 - Tents (fabric covered)
- **About 185 full time employees**



ESF Site Facilities - Current Condition



- Warehouse and craft metal fabrication functions located in tent structures on the north portal pad
- Other craft activities performed under corrugated metal sunshades
- Craft work environment not climate controlled
- Aged and deteriorating office space for staff
- 45-minute minimum response time for fire & rescue services



Lower Muck Yard Complex - Proposed Plan



- **Draft Environmental Assessment examines alternatives to relocate ESF warehouse and craft shops to proposed structures adjacent to the north portal pad on previously disturbed land**
- **Proposed Action Considers:**
- **Construct and equip new medical and fire station (8,000 ft²), and heavy equipment maintenance shop (8,000 ft²)**
- **Construct craft, warehouse, and administrative facility (approx. 30,000 ft² each)**



Current Condition of Underground Rail System

- **ESF rail installed from 1993 to 1998**
- **As-constructed condition did not secure gauge**
- **Use has resulted in broken joint plates and increasing rail maintenance**

To address rail condition the DOE has:

- **Conducted detailed assessments in 2000 and 2004**
- **Developed and implemented rail and rolling stock maintenance programs and rail inspector qualifications**
- **Implemented additional rail speed mitigations (currently 5 mph)**



Underground Electrical System – Mine Power Centers (MPC)



- **Preventive maintenance completed in FY 2005**
- **Back panels still inaccessible for repairs**
- **Clearance issues with trains in tunnel**
 - **Speed restrictions in proximity to MPC platforms**



Underground Fire Alarm and Detection System



- Serves as a means of detecting underground fire, providing notification to personnel
- Need identified in a 2004 fire hazards analysis
- Satisfies the requirements of National Fire Protection Association 72 and 502
- Installation completed in North Ramp, ECRB* and Alcove 5
- Remaining sections of system will be installed in 2008

* ECRB = Cross drift for enhanced characterization of the repository block



Underground Lighting Upgrade



- **Based on results of an independent assessment, recommendations made to complete modifications to the lighting system and implement a maintenance/repair program**
- **System repair completed to Alcove 6**
- **Installation will be completed conjunction with Fire Detection System**



Underground Ventilation Improvements



- A 2004 assessment recommended modifications to the ventilation system and implementation of a maintenance/repair program
- Temperature and vibration monitors installed on fans
- Fan 10 and 11 planned for replacement



Ground Support



- **System assessed in 2004**
- **Implemented additional ground support controls in certain areas**
- **Implemented a rockbolt maintenance program**
- **2004 Fire Hazard Analysis recommended grout of eight 3.01X areas to lower fire load**
 - **Safety mitigations in place in these areas to reduce fire risk**



Conveyor System



- To reduce the fire load underground and improve safety, removal of the tunnel boring machine muck conveyor system was recommended in three phases:
 - Belt removal
 - Surface Sections removal
 - Subsurface Sections removal
- Surface structure and belt and ECRB cross drift belt removed



Water Supply System

- **Water wells J-13 and J-12 are the water wells for Yucca Mountain Project and National Nuclear Security Administration activities in Area 25**
 - Well J-13 submersible pump has failed and casing is degrading; J-12 is currently sole source of water
 - Transfer pumps (from J-12 to J-13) are failing and need to be replaced
 - Piping system from J-12 to J-13 is old and has had a number of breakages
- **Examining options to replace J-13 and system piping**
- **Pursuant to an agreement with the State of Nevada, 420,000 gallons per year of potable water and 1.78 million gallons per year of non-potable water to support current operations is authorized for project use pending resolution of, or change status of, ongoing litigation**



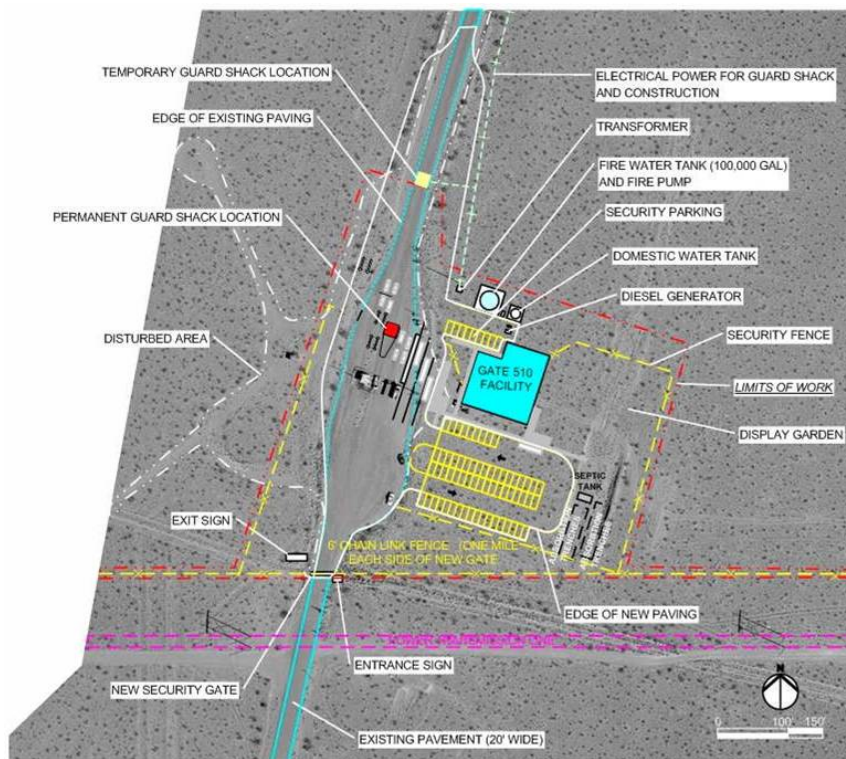
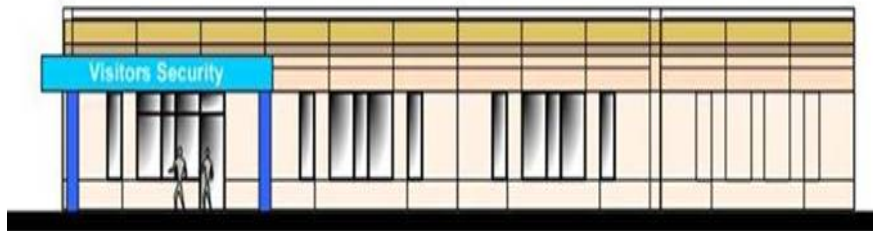
Gate 510 – Current Condition



- **Entry point for site work staff and visitors with very limited functionality**
- **No badging capabilities**
- **No site access control capabilities**



Gate 510 – Proposed Plan



GATE 510 FACILITY - PROPOSED SITE PLAN

- Construct new approx. 9,000 ft² facility at the existing Gate 510 location
- New Gate 510 facility functions include:
 - Enhanced security and access control
 - Badging
 - Site access control
 - Site access training and training verification
 - Backup emergency operations center supporting current activities
 - Hazardous material tracking



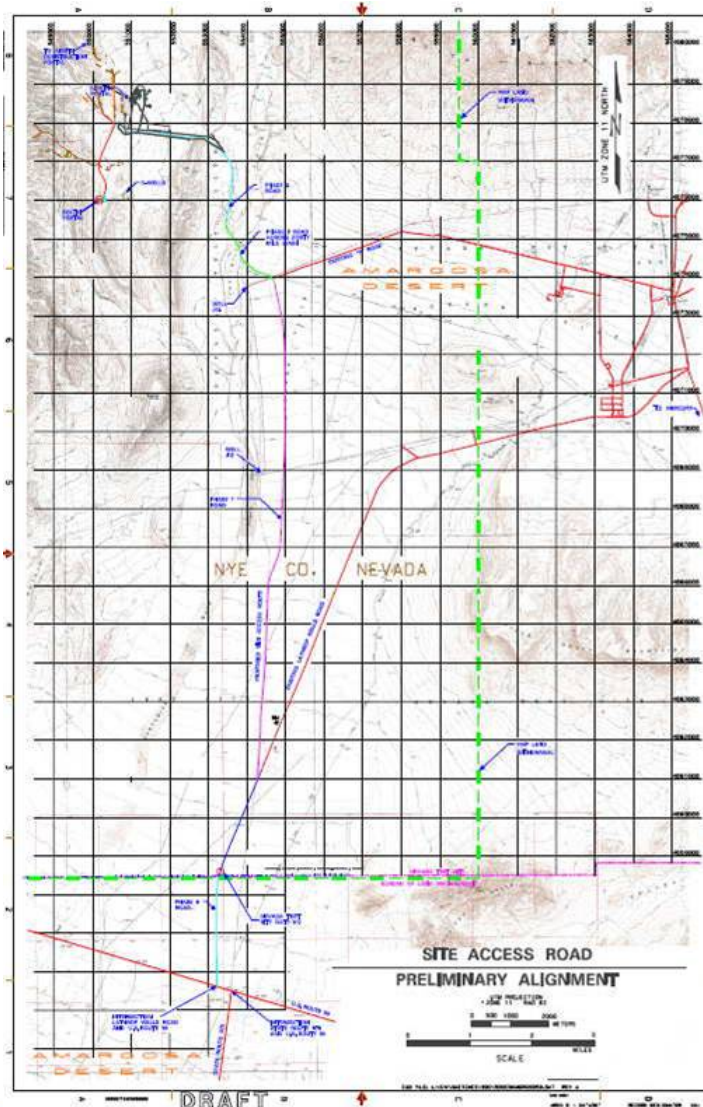
Site Access Road – Current Condition



- **Constructed in early 1960s**
- **Hill and dale construction means with minimal sub-bed**
- **Deteriorating asphalt surface**
- **Poor drainage**
- **Increasing maintenance and repair needed**



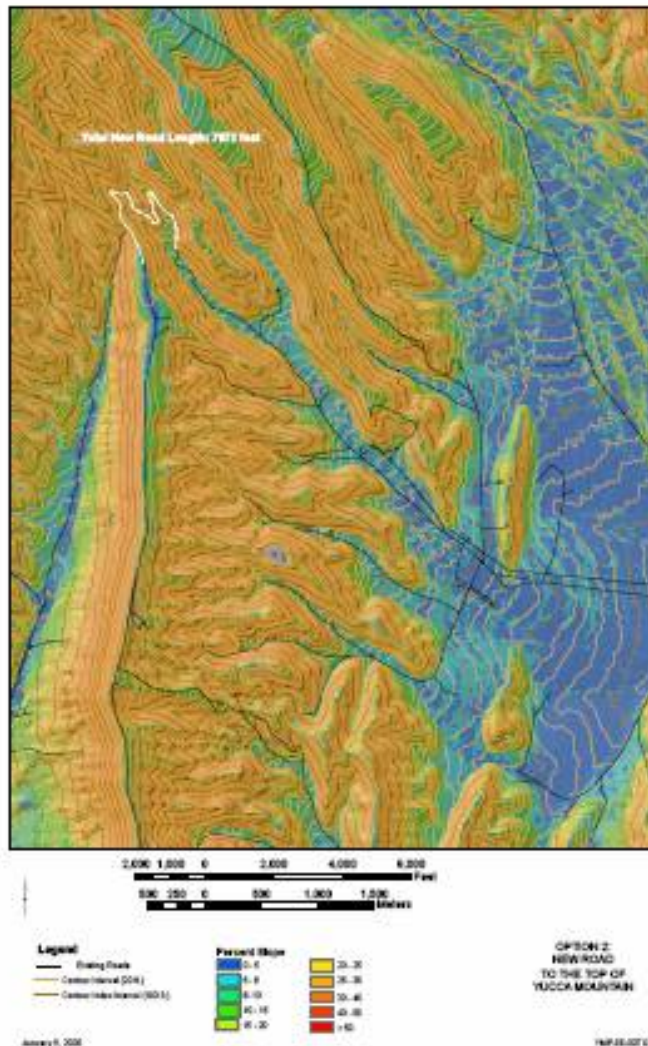
Site Access Road Proposed Improvements



- Draft Environmental Assessment examines alternatives for a new access road
- Options include:
 - Reconstruction of existing alignment or new direct route



Yucca Mountain Proposed Crest Road Improvements



Existing crest road is unpaved with grades up to 23%

- **Draft Environmental Assessment examines alternatives to develop a new 1.3 mile crest road connection maintaining a <8% grade**
- **Connects with existing paved “H” road in vicinity of sub-dock area near north portal and intersects with road at the crest**
- **Chipseals road along Yucca Mountain crest**



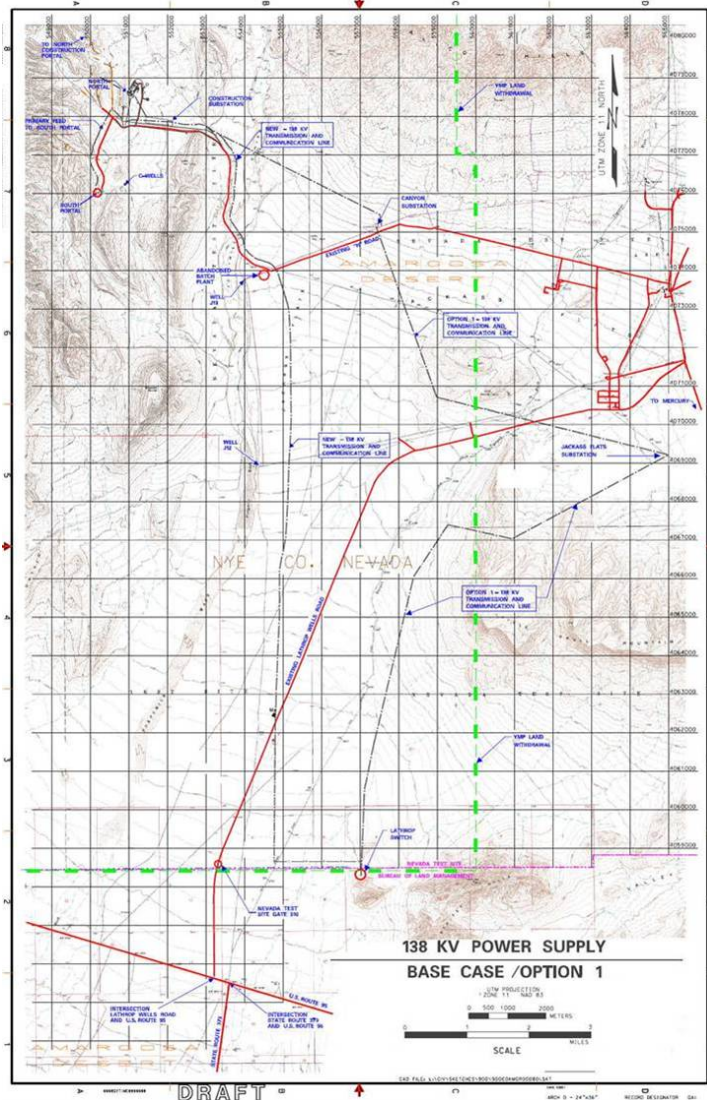
Offsite Power to the ESF– Current Conditions



- **Current power provided by 69 kV line from the NTS Grid**
- **Only remaining 69 kV line on the NTS**
- **Limited to 10 MW total power**
- **Single-point failure**



Offsite Power to the ESF - Proposed Improvements



- Draft Environmental Assessment examines alternatives a new 138 kV transmission line on site from Lathrop Wells switch
- Negotiate preferable utility use rates with utility vendor
- Construct a substation at lower muck yard
- Provide reliable power to North and South Portals



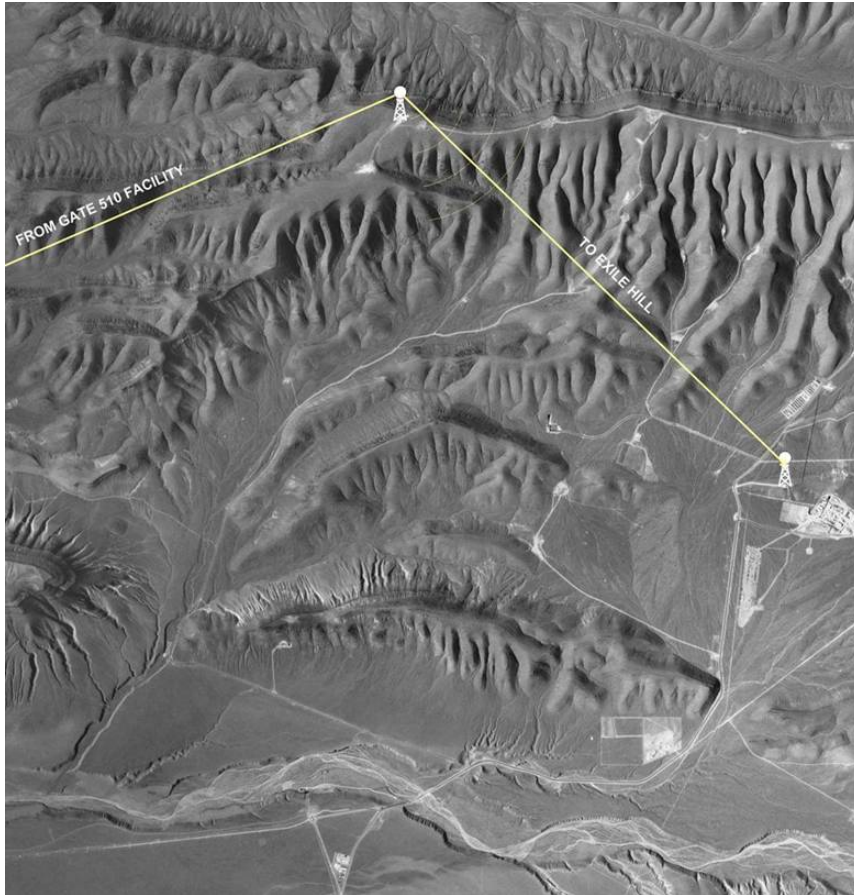
Communication System – Current Conditions



- **Currently provided via analog microwave transmitter at north portal pad and interfaced with Nevada Test Site microwave system**
- **Functioning at maximum operating rate of 1 Mb**
- **Extremely slow**
- **Single-point failure**



Communication System Upgrades



- **Constructing new digital microwave transmitter system**
- **Towers to be installed at Exile Hill, Yucca Crest, and Gate 510 with interface with fiber optic line at Lathrop Wells.**
- **Increased transfer rate to 40 Mb**
- **Eliminate single-point failure**
- **Estimated completion in March 2007**



Sample Management Facility



Proposed Plan

- **Locate a facility for lease outside the boundaries of the Nevada Test Site**

Current Condition

- **Built in mid-1960s**
- **Currently at maximum capacity**
- **Rapidly deteriorating due to age**



Summary

- **DOE/OCRWM is committed to the safe and reliable operation of the Yucca Mountain Site**
 - **Safety upgrades and maintenance in the underground are prioritized based on need**
- **A draft Environmental Assessment has been completed addressing improvements at the Yucca Mountain Site**
- **Improvements can be initiated upon final DOE decision on the Environmental Assessment**

