



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

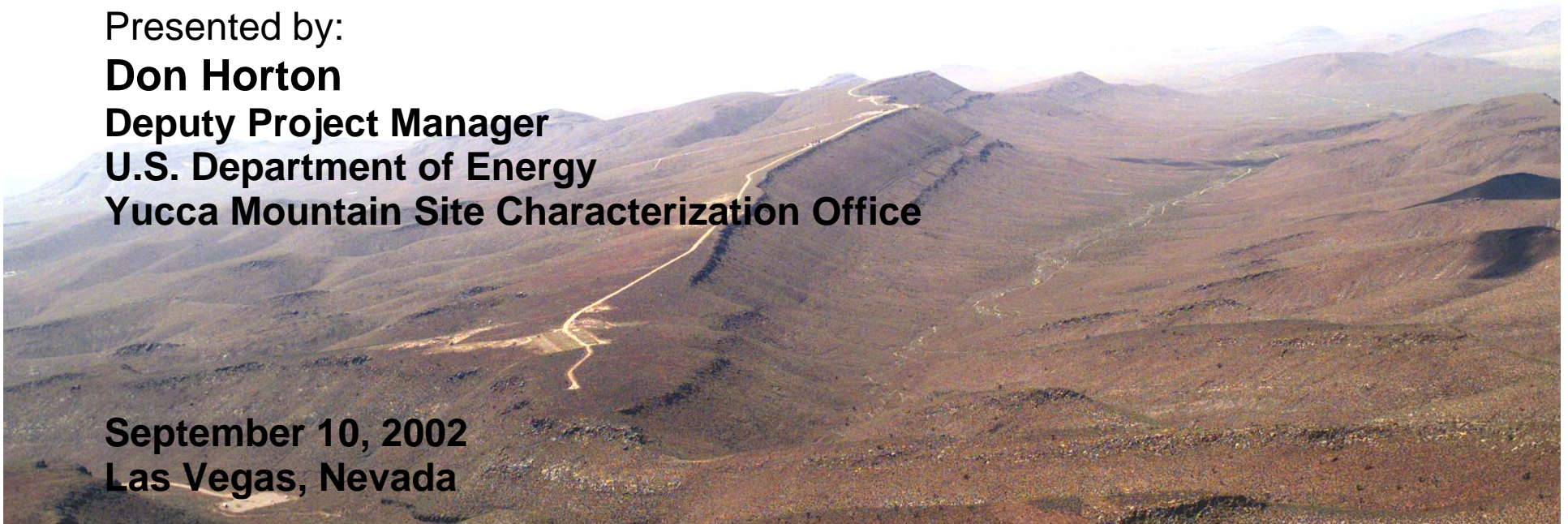


Yucca Mountain Project Plans

Presented to:
Nuclear Waste Technical Review Board

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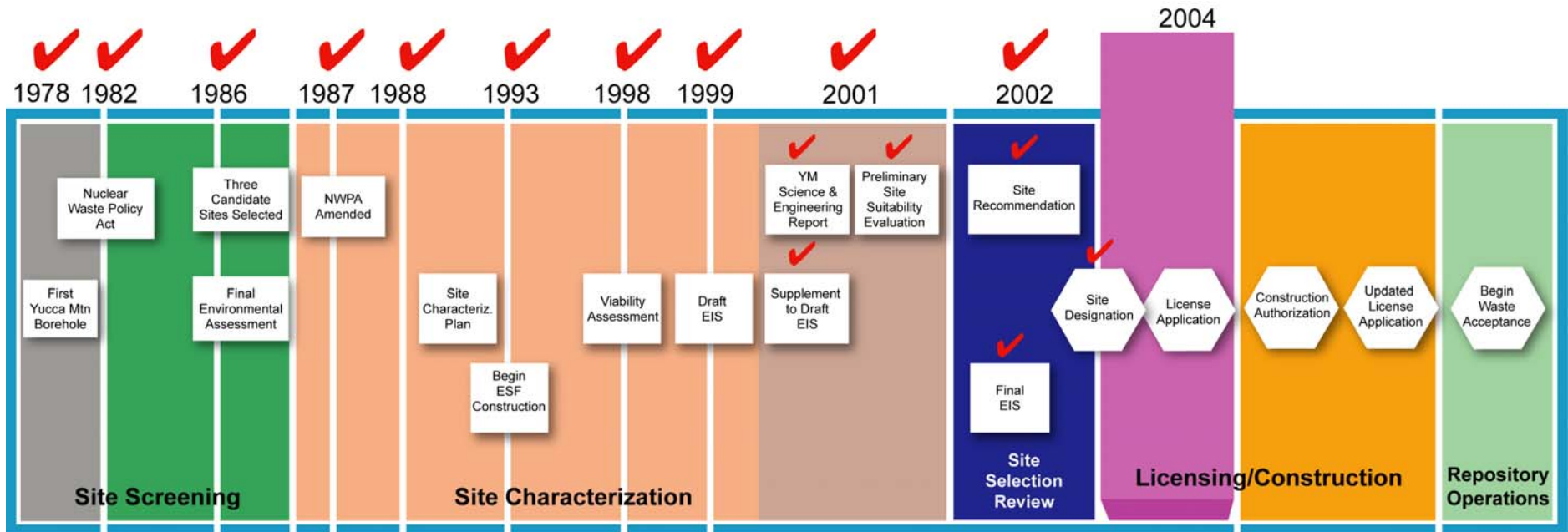


Outline

- **Yucca Mountain Project Status**
- **Major Technical Activity Streams**
 - **Repository Safety Prior to Permanent Closure**
 - **Repository Safety After Permanent Closure**
- **Repository Safety Case**
- **Summary**



Yucca Mountain Project Status



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Yucca Mountain Project Status

(Continued)

- **DOE's highest priority is protecting the health and safety of workers and the public, and protecting the environment**
 - **Instill a safety conscious culture across the Project**
 - **Develop a license application that successfully meets the Nuclear Regulatory Commission's (NRC's) requirements**
- **DOE plans to submit the license application (LA) to the NRC in December 2004**
 - **Programmatic sections of the LA currently in development**
- **Focus of technical work is on engineering and design, performance assessment, scientific activities, and continuing testing and performance confirmation**



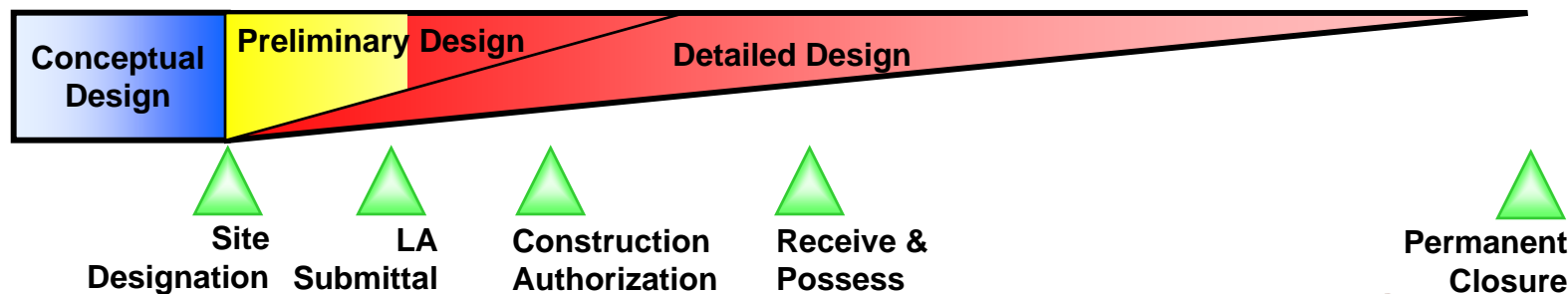
Major Technical Activity Streams

- **Repository safety prior to permanent closure**
 - Engineering and design
 - Design evolution
 - Preclosure safety analysis (PSA)
- **Repository safety after permanent closure**
 - Total System Performance Assessment for the LA (TSPA-LA)



Repository Safety Prior to Permanent Closure Engineering and Design

- **Preliminary design at LA submittal will emphasize systems important to safety**
 - Includes concept of operations that will be included in LA and provides a basis to PSA
 - Design will evolve and the level of detail will increase, as DOE learns more and adjusts to changes in our understanding of the system
- **Progress toward completion of the preliminary design will be tracked through interim design reviews**



Repository Safety Prior to Permanent Closure Design Evolution

- **The preliminary design that will support the LA will consist of additional detail and refinements to the design concept for Site Recommendation (SR)**
- **Final decisions and approvals of the LA design have not been made**
- **The LA design is expected to fall within the bounds established for the flexible design concept described in the SR and the Environmental Impact Statement**
- **Environmental impact analyses are part of the evaluation and selection process for significant design changes**



Repository Safety Prior to Permanent Closure

Preclosure Safety Analysis

- **PSA is a quantitative analysis of potential events during operations and their consequences (doses to workers and/or public)**
 - Start with descriptions of the site and design
 - Identify potential events and their probabilities of occurrence
 - Assess adequacy of facilities to perform as intended
 - Identify any limits on design or operations
 - Describe means to mitigate or prevent accidents
- **PSA iterates with design to achieve preclosure performance objectives**
 - Provides mechanism to integrate design concepts and evaluate performance



Repository Safety After Permanent Closure

Total System Performance Assessment

- **Major elements in the development of TSPA-LA**
 - Incorporate new scientific data and information
 - Qualify and validate Supplemental Science and Performance Analyses (SSPA) and Final Environmental Impact Statement (FEIS) models
 - Address NRC-DOE Key Technical Issue Agreement Items
 - Improve treatment of features, events, and processes, and scenario analyses
 - Perform TSPA-LA licensing compliance analyses
 - ◆ Evaluate dose-based performance objectives
 - ◆ Demonstrate multiple barriers



Repository Safety After Permanent Closure Total System Performance Assessment

(Continued)

- **Documentation milestones include**
 - **TSPA-LA Methods and Approach Document (9/02)**
 - **Process Model and Abstraction Analysis and Modeling Reports (AMRs) (6/03)**
 - **Features, Events, and Processes Database for LA (10/03)**
 - **TSPA-LA Model AMR (12/03)**
 - **TSPA-LA Analysis Report (5/04)**



Repository Safety Case

- **A safety case is a set of logic, analyses, and calculations, including quantitative and qualitative supporting information, that show the repository would meet the performance objectives**
- **DOE's safety case will be documented as the licensing bases for the LA**
- **In addition to the quantitative safety analysis, the preclosure licensing bases will include:**
 - **Design margin and defense-in-depth; Commercial nuclear reactor precedent and experience**



Repository Safety Case

(Continued)

- **In addition to quantitative performance assessment results the postclosure licensing bases will include multiple lines of evidence:**
 - **Multiple natural and engineered barriers; Natural and man-made analogues; Continued testing and evaluation**
- **DOE is considering the merits of preparing a separate document to communicate with decision makers and the public**



Summary

- **DOE has developed plans and schedules to submit a license application to NRC in December 2004**
- **Focus of major technical activity streams is engineering and design, performance assessment, and continuing testing and performance confirmation**
 - **Progress toward completion of the preliminary design will be tracked through interim design reviews**
 - **PSA will be developed iteratively with design**
 - **TSPA emphasis will be on enhancing confidence and adequately representing uncertainty**
 - **Continued science, testing, and performance confirmation will be managed in an integrated manner**
 - **DOE's safety case will be documented as the licensing bases for the LA**



Pre-Submittal Technical Products Schedule

