

STATE OF NEVADA

Presentation To

NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: INTRODUCTION

DATE: JUNE 26, 1989

PRESENTER: ROBERT R. LOUX

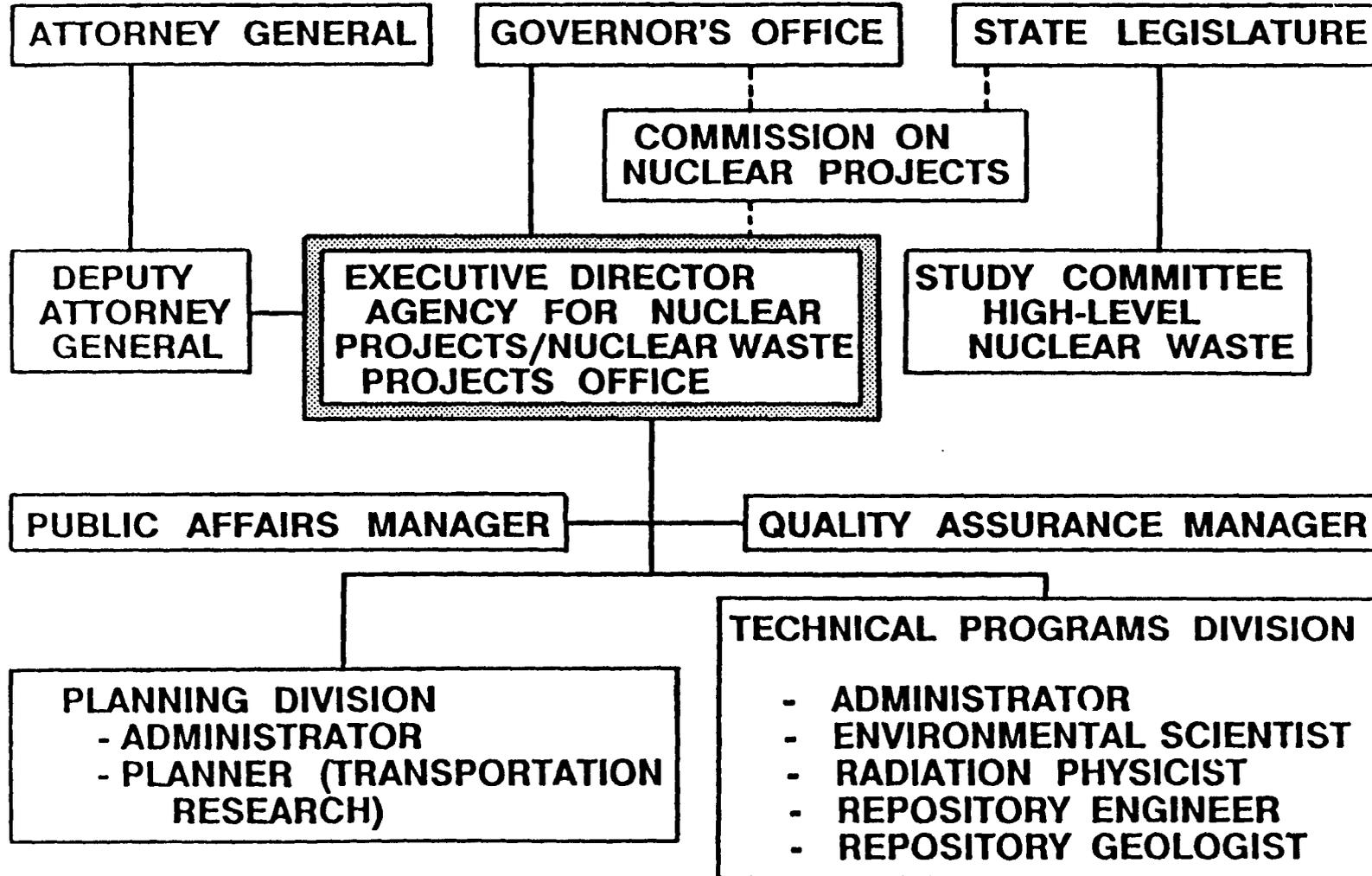
TITLE: EXECUTIVE DIRECTOR

ORGANIZATION: NEVADA AGENCY FOR NUCLEAR PROJECTS
CARSON CITY, NEVADA

TELEPHONE: (702) 885-3744



STATE OF NEVADA AGENCY FOR NUCLEAR PROJECTS
ORGANIZATIONAL CHART





- AGENCY FOR NUCLEAR PROJECTS RESPONSIBLE FOR OVERSIGHT OF DOE'S HIGH-LEVEL RADIOACTIVE WASTE REPOSITORY PROGRAM.
- AGENCY ACTIVITIES FUNDED THROUGH DOE GRANTS FROM NWPA NUCLEAR WASTE FUND.



AGENCY GOALS

- TO INSURE THAT PUBLIC HEALTH AND SAFETY AND THE ENVIRONMENT ARE ADEQUATELY PROTECTED.
- TO ASSESS SOCIAL, ECONOMIC AND TRANSPORTATION IMPACTS THAT THE STATE COULD EXPERIENCE.
- TO PROVIDE POLICY GUIDANCE TO THE GOVERNOR AND OTHER STATE LEADERS.



TECHNICAL ACTIVITIES

- DEFINE TECHNICAL ISSUES CRITICAL TO THE HEALTH AND SAFETY OF NEVADANS AND THEIR ENVIRONMENT.
- REVIEW DOE PLANS, STUDIES, AND DOCUMENTS.
- MONITOR DOE FIELD AND LABORATORY ACTIVITIES.
- CONDUCT INDEPENDENT STUDIES RELATED TO ISSUES OF CONCERN.

NWPO



STATE OF NEVADA

Presentation To

NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: OVERVIEW OF TECHNICAL CONCERNS
ABOUT PROPOSED YUCCA MOUNTAIN
NUCLEAR WASTE REPOSITORY.

DATE: JUNE 26, 1989

PRESENTER: CARL A. JOHNSON

TITLE: ADMINISTRATOR OF TECHNICAL PROGRAMS

ORGANIZATION: NEVADA AGENCY FOR NUCLEAR PROJECTS
CARSON CITY, NEVADA

TELEPHONE: (702) 885-3744



PURPOSE OF PRESENTATION

**DISCUSS NEVADA'S TECHNICAL SITE SUITABILITY
CONCERNS RELATED TO THE PROPOSED YUCCA
MOUNTAIN REPOSITORY SITE.**



OVERVIEW PRESENTATION AGENDA

- GENERAL SITE SUITABILITY CONCERNS
- SITE SUITABILITY TECHNICAL ISSUES



**GENERAL SITE
SUITABILITY CONCERNS**

1. SITE SUITABILITY TECHNICAL ISSUES

- 1987 NWPAA IDENTIFYING THE LOCATION OF YUCCA MOUNTAIN AS THE SINGLE CANDIDATE SITE FOR CHARACTERIZATION DOES NOT ASSURE THE SUITABILITY OF THE SITE.

- EARLY RESOLUTION OF SITE KEY SUITABILITY ISSUES



2. REGULATORY POLICY ISSUES

- 10 CFR PART 100, APPENDIX A
- DATA SUFFICIENCY
- DETERMINISTIC vs. PROBABALISTIC APPROACHES
- SYSTEM LICENSING
- PHASED LICENSING
- LAND OWNERSHIP AND CONTROL



3. SITE DISTURBANCE ISSUES

● DEVELOPMENT OF SUFFICIENT DATA

WITHOUT SACRIFICING SITE INTEGRITY

- USE OF HIGH RESOLUTION GEOPHYSICS
- PENETRATION OF CALICO HILLS TUFF
- CHARACTERIZATION OF FRACTURE SYSTEMS



4. LONG-TERM POST-CLOSURE ISSUES

- **DEEP GEOLOGIC REPOSITORY IS
A 10,000 YEAR PROJECT**
 - **PREDICTABILITY**
 - **LONG-TERM RISKS**
 - **ENGINEERED BARRIERS**
 - **AVAILABLE TECHNOLOGY**



BASIS OF TECHNICAL CONCERN

**10 CFR 60.31(a) PROVIDES THAT THE COMMISSION
MAY AUTHORIZE CONSTRUCTION IF IT DETERMINES:**

**"That there is reasonable assurance that
the types and amounts of radioactive
materials described in the application can
be received, possessed, and disposed of in
a geologic repository operations area of
the design proposed [at the site proposed]
without unreasonable risk to the health and
safety of the public. . . ."**



**SITE SUITABILITY
TECHNICAL ISSUES**

1. **UNDERSTANDING THE TECTONIC SETTING OF
SOUTHERN NEVADA AND ITS IMPLICATIONS
FOR YUCCA MOUNTAIN SITE SUITABILITY**
 - **GEOLOGIC PROCESSES**
 - **DEEP GEOLOGIC STRUCTURES**
 - **EARTHQUAKE vs. FAULT RELATIONSHIPS**
 - **EFFECT OF NUCLEAR TESTING**
 - **STRESS REGIME**
 - **TECTONIC AFFECT ON HYDROLOGY**



2. ACTIVE FAULTING AT YUCCA MOUNTAIN

- ACTIVE FAULTS IDENTIFIED
- STYLES OF FAULTING
- RECURRENCE RATES
- EARTHQUAKE vs FAULT RELATIONSHIPS
- RELATION TO HYDROLOGIC REGIME



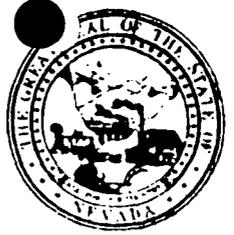
3. CHARACTERISTICS OF THE VADOSE
(UNSATURATED) ZONE

- MATRIX vs FRACTURE FLOW
 - ROCK PORES PARTIALLY FILLED
 - TUFFS HIGHLY FRACTURED
 - EVIDENCE OF FRACTURE FLOW
 - RAPID FLOW RATES
 - FRACTURE CHANGES WITH TIME
- GASEOUS PHASE MOVEMENT



4. REGIONAL GROUNDWATER FLOW

- RELATIONSHIP OF YUCCA MOUNTAIN
AQUIFER TO REGIONAL FLOW SYSTEM
- RAPID FLOW
- FUTURE WATER SUPPLY



**5. UNCERTAINTY IN MODELING AND
PERFORMANCE ASSESSMENT**

- **LACK OF ACCEPTED MODELS**
- **LACK OF EXPERIENCE IN MODELING
PERFORMANCE FOR 10,000 YEARS**
- **REPRESENTATIVENESS OF DATA**
- **COMPLEXITY OF NATURAL SYSTEMS**
 - **DYNAMIC NATURAL SYSTEMS**
 - **COUPLED PROCESSES**



6. GEOCHEMISTRY

● RETARDATION

- ABILITY OF SORPTIVE MINERALS TO RETARD RADIONUCLIDES
- REDUCTION IN SORPTIVE CAPACITY WITH INCREASED TEMPERATURES
- LIMITED SORPTIVE MINERALS ALONG FRACTURES

● DISTURBED ZONE

- ALTERATION OF VADOSE WATER CHEMISTRY
- ALTERATION OF HOST ROCK



7. VOLCANISM

- YOUNG VOLCANIC EVENTS
- RECURRENCE RATES
- VOLCANISM vs. HYDROLOGY RELATIONSHIPS
- STRUCTURAL CONTROL



8. CLIMATE CHANGE

- EFFECT ON HYDROLOGIC SYSTEM
- PREDICTABILITY
- " PAST MAY NOT BE KEY TO FUTURE"
 - GREENHOUSE EFFECT
 - RATES OF CHANGE



9. NATURAL RESOURCE POTENTIAL

- **MINERAL RESOURCES**
- **OIL AND GAS RESOURCES**
- **GEOHERMAL RESOURCES**
- **WATER RESOURCES**



TECHNICAL PRESENTATIONS

TECTONICS DR. MICHAEL ELLIS
DR. RICHARD SCHWEICKERT

FAULTING JOHN BELL

HYDROLOGY

UNSATURATED ZONE DR. MARTIN MIFFLIN

SATURATED ZONE DR. JOHN FORDHAM

HYDROLOGIC MODELING SCOTT TYLER

PERFORMANCE ASSESSMENT LINDA LEHMAN

GEOCHEMISTRY DR. MAURICE MORGENSTEIN
DR. DONALD SHETTEL

VOLCANISM DR. EUGENE SMITH

CLIMATE CHANGE DR. MARTIN MIFFLIN

MINERAL RESOURCES DR. LAWRENCE LARSON