

3/12/91

27.21

273

STATUS OF CNWRA

- o **50% INCREASE IN PROFESSIONAL STAFF TO 42,
TOTAL CENTER STAFF AT 55**
- o **APPROACHING FULL STAFFING FOR PROJECTED
LEVEL OF FUNDING**
- o **TRANSITION TO PROVIDING EFFECTIVE TECHNICAL
ASSISTANCE AND RESEARCH SUPPORT**

SLIDE14

PROFESSIONAL STAFF CHARACTERISTICS

	RES/TECH	TOTAL
o Ph.D./J.D.	17 (80%)	19 (45%)
o M.S./M.A.	2 (10%)	10 (24%)
o B.S./B.A.	2 (10%)	13 (31%)
o EXPERIENCE (SINCE FIRST)	16 YR	18 YR
o EXPERIENCE (SINCE LAST)	11 YR	13 YR

SLIDE 15

STAFF DEVELOPMENT

- o **IN-HOUSE STAFF DEVELOPMENT**
 - NEW EMPLOYEE TRAINING
 - BIWEEKLY SEMINARS
- o **CONTINUING EDUCATION**
 - LOCAL UNIVERSITIES
 - NRC SPONSORED TRAINING
 - 1 WEEK ANNUAL TRAINING
- o **SYMPOSIA, CONFERENCES, WORKSHOPS,
AND TECHNICAL INTERCHANGES**
- o **INTERNAL RESEARCH AND DEVELOPMENT**

SLIDE 16

CNWRA FACILITIES

- o ENHANCEMENT OF EARTH AND MATERIALS SCIENCES EXPERIMENTAL FACILITIES**
- o IBM MAINFRAME AND PERSONAL COMPUTERS**
- o ACCESS TO SUPERCOMPUTERS**
- o GRAPHIC INFORMATION SYSTEM -- 2-D AND 3-D COMPUTER VISUALIZATION**
- o PLANNING EXPANDED OFFICES**
- o WASHINGTON TECHNICAL SUPPORT OFFICE**

SLIDE 17

TYPES OF CNWRA SUPPORT TO PROGRAM AREAS

- o TECHNICAL ASSISTANCE**
 - DIVISION OF HIGH-LEVEL WASTE**
 - WASTE SOLIDIFICATION SYSTEM**
- o RESEARCH**

SLIDE 18

PRINCIPAL PROGRAMMATIC AREAS

- o WASTE SYSTEMS ENGINEERING**
- o ENGINEERED BARRIER SYSTEM**
- o REPOSITORY DESIGN, CONSTRUCTION,
AND OPERATIONS**
- o GEOLOGIC SETTING**
- o PERFORMANCE ASSESSMENT AND
HYDROLOGIC TRANSPORT**
- o QUALITY ASSURANCE**

SLIDE 19

WASTE SYSTEMS ENGINEERING ACCOMPLISHMENTS

- o SYSTEMATIC REGULATORY ANALYSIS OF PART 60**
- o COMPLETED REPOSITORY FUNCTIONAL ANALYSIS**
- o SUPPORT TO NRC UNCERTAINTY REDUCTION
TEAM**
- o ESTABLISHED USER-FRIENDLY COMPUTER
SUPPORT SYSTEM**
- o SUPPORT TO DEVELOPMENT OF LICENSE
APPLICATION REVIEW STRATEGY**

SLIDE 20

ENGINEERED BARRIER SYSTEM ACCOMPLISHMENTS (TECHNICAL ASSISTANCE)

- o COMPLETED TECHNICAL EVALUATION OF
CONTAINMENT REQUIREMENT, 12/90**
- o PREPARED DEVELOPMENT PLAN FOR
EBSPAC, 1/91**
- o EVALUATED THERMAL MODELS FOR
EBSPAC**

SLIDE 21

ENGINEERED BARRIER SYSTEM ACCOMPLISHMENTS (RESEARCH)

- o COMPLETED CRITICAL ASSESSMENT OF
DOE AND NRC CORROSION WORK**
- o CONDUCTED FULL FACTORIAL
EXPERIMENT OF ALLOY 825 CORROSION**
- o INTRODUCED 'LOCALIZED CORROSION
INDEX' CONCEPT**
- o INITIATED PITTING POTENTIAL AND
CREVICE CORROSION EXPERIMENTS**

SLIDE 22

**REPOSITORY DESIGN,
CONSTRUCTION, AND OPERATIONS
ACCOMPLISHMENTS
(TECHNICAL ASSISTANCE)**

- o SUPPORT TO NRC REVIEW OF PRELICENSING SUBMITTALS**
- o CONDUCTED SRA FOR WASTE RETRIEVABILITY AND THERMAL LOADS**
- o CONTINUED DEVELOPMENT OF TECHNICAL POSITION ON THERMAL LOADS**
- o INITIATED REGULATORY AND TECHNICAL EVALUATIONS ON REPOSITORY OPERATIONAL CRITERIA**

SLIDE 23

**REPOSITORY DESIGN,
CONSTRUCTION, AND OPERATIONS
ACCOMPLISHMENTS
(RESEARCH)**

- o COMPLETED INSTRUMENTATION OF FIELD
SITE, 2/91**
- o COMMENCED DYNAMIC SHEAR TESTS**
- o MEASURED MATERIALS PROPERTIES**
- o EVALUATED 3 COMPUTER MODELS**
- o SECURED DNA DATA FOR MODEL
VALIDATION**

SLIDE 24

**GEOLOGIC SETTING
ACCOMPLISHMENTS
(TECHNICAL ASSISTANCE)**

*Possible alternative
approaches*

- o COMMENCED EVALUATION OF GWTT —
- o CONDUCTED PILOT STUDY OF
COMPUTERIZED BALANCING, 9/90
- o CONTINUED EVALUATION OF NATURAL
RESOURCES ASSESSMENT
- o REVIEWED DOE REGIONAL HYDROLOGY STUDY
PLAN
- o EVALUATED 'SEISMIC PUMPING' ISSUE

SLIDE 25

GEOLOGIC SETTING ACCOMPLISHMENTS (RESEARCH)

- o CONDUCTED ION-EXCHANGE EXPERIMENTS**
- o MODELED GEOCHEMICAL CONSTRAINTS
ON YUCCA MOUNTAIN GEOCHEMISTRY**
- o ESTABLISHED GEOCHEMICAL CONDITIONS FOR
MATERIALS TESTING**
- o INITIATED EVALUATION OF GEOCHEMICAL
NATURAL ANALOG SITES**
- o INITIATED STUDY OF SORPTION
MECHANISMS**

SLIDE 26

**PERFORMANCE ASSESSMENT AND
HYDROLOGIC TRANSPORT
ACCOMPLISHMENTS
(TECHNICAL ASSISTANCE)**

- o **COMMENCED WORK ON TOTAL SYSTEM
CODE (IPA)**
- o **INITIATED PREPARATION OF SOURCE
TERM MODULE**
- o **INITIATED EVALUATION OF VAPOR PHASE
TRANSPORT AND RADIONUCLIDE
SOLUBILITY**
- o **BEGAN SRA RELATED TO EPA STANDARD**

SLIDE 27

PERFORMANCE ASSESSMENT AND HYDROLOGIC TRANSPORT ACCOMPLISHMENTS (RESEARCH)

- o COMPLETED TECHNOLOGY TRANSFER
- o EVALUATED METHODS FOR
NON-ISOTHERMAL
MULTIPHASE FLOW AND TRANSPORT
- o COMPLETED 6 THERMOHYDROLOGY
EXPERIMENTS -- FLOW
VISUALIZATION
- o NUMERICALLY SIMULATED EXPERIMENTS
- o DERIVED SCALING PARAMETERS
- o PARTICIPATED IN INTRAVAL -- 3-D
COMPUTER VISUALIZATION OF FLOW
- o CONDUCTED WORKSHOP ON FLOW AND
TRANSPORT IN UNSATURATED ZONE

SLIDE 28

Total System Code

HIGH LEVEL WASTE
MANAGEMENT

MARCH 14, 1991

BRIEFERS: R. BERNERO, NMSS

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BRIEFING OUTLINE

- o INTRODUCTION
- o STATUS OF HIGH-LEVEL WASTE PROGRAM
 - PLANS
 - ACCOMPLISHMENTS
- o STATUS OF CNWRA
 - PERSONNEL, FACILITIES, TRAINING
 - ACCOMPLISHMENTS

SLIDE 1

NRC REPOSITORY PROGRAM ACTIVITIES

- o **REGULATORY REQUIREMENTS AND TECHNICAL GUIDANCE ✓**
- o **DEVELOPMENT OF TECHNICAL ASSESSMENT CAPABILITIES AND METHODS ✓**
- o **QUALITY ASSURANCE**
- o **SITE CHARACTERIZATION REVIEW**
- o **SYSTEMATIC REGULATORY ANALYSES OF 10 CFR PART 60**

SLIDE 2

REGULATORY REQUIREMENTS

- o **EPA STANDARD**
 - **COMMENTS ON WORKING DRAFT 2 (8/90)**
 - **CONSIDERATION OF NEGOTIATED
RULEMAKING**
 - **UNCERTAINTY PAPER (DRAFT 6/90)**
 - **ITERATIVE PERFORMANCE ASSESSMENT
(4/90)**
- o **REPOSITORY OPERATIONS CRITERIA**
 - **SCOPE EXPANDED BEYOND DESIGN BASIS
ACCIDENT**

SLIDE 3

REGULATORY REQUIREMENTS **(CONTINUED)**

- o **SUBSYSTEM REQUIREMENTS**
 - **TECHNICAL CONSIDERATIONS FOR
SUBSTANTIALLY COMPLETE
CONTAINMENT**
 - **TECHNICAL CONSIDERATIONS FOR
GROUNDWATER TRAVEL TIME**
 - **DEVELOP AND USE PERFORMANCE
ASSESSMENT**

SLIDE 4

TECHNICAL GUIDANCE

- o TECHNICAL POSITIONS
 - FAULT DISPLACEMENT AND SEISMIC HAZARDS INVESTIGATIONS (DRAFT 2/91)
 - EXPLORATORY SHAFT FACILITY DESIGN AND CONSTRUCTION (DRAFT 7/90)

SLIDE 5

- Thermal loading
- Probabilistic seismic
hazards analysis

codify

TECHNICAL GUIDANCE (CONTINUED)

Document

- o STAFF POSITIONS
 - WASTE PACKAGE CONTAINMENT PERIOD (7/90)
 - PERFORMANCE OBJECTIVES RELATED TO SITING CRITERIA (8/90) ✓
 - PERFORMANCE OBJECTIVES RELATED TO THERMAL LOADS (8/90)
- o REGULATORY GUIDES
 - LICENSE APPLICATION FORMAT AND CONTENT (DRAFT 11/90)
 - LICENSING SUPPORT SYSTEM TOPICAL GUIDELINES (DRAFT 9/90)

SLIDE 6

LARP

QUALITY ASSURANCE

- o **CRITICISM OF QUALITY ASSURANCE**
 - **REGULATIONS AND GUIDANCE ARE FLEXIBLE**
 - **DOE IMPLEMENTATION PROBLEM**
- o **STATUS OF QUALITY ASSURANCE OBJECTION**
 - **REVIEWS AND AUDITS**
 - **PARTIAL ACCEPTANCE**
 - **EFFECT OF NEW DOE CONTRACTOR (TRW)**

SLIDE 7

SITE CHARACTERIZATION REVIEW ACTIVITIES

- o NRC SITE CHARACTERIZATION ANALYSIS
 - DOE RESPONSE (12/90)
 - STATUS OF OBJECTIONS
 - QUALITY ASSURANCE
 - EXPLORATORY SHAFT FACILITY
- o STUDY PLAN REVIEWS
 - COMPLETED FOUR STUDY PLAN REVIEWS
 - MIDWAY VALLEY; VEIN DEPOSITS
 - NO OBJECTIONS TO DOE STARTING

THESE TWO STUDIES

*DO have
been received*

2

Est. plan -
SLIDE 8

*Surface-based
testing*

*Trenching for
Fault Midway*

DOE REPOSITORY PROGRAM

- o NEW OPENNESS AND WILLINGNESS TO MEET AND DISCUSS ISSUES
- o STRATEGIC PRINCIPLES WORKSHOP
- o DOE IS WORKING TO RESOLVE ISSUES AND PRELIMINARY INPUT LOOKS GOOD

SLIDE 9

Denver workshop -
April 3/4

CENTER CONTRACT STATUS

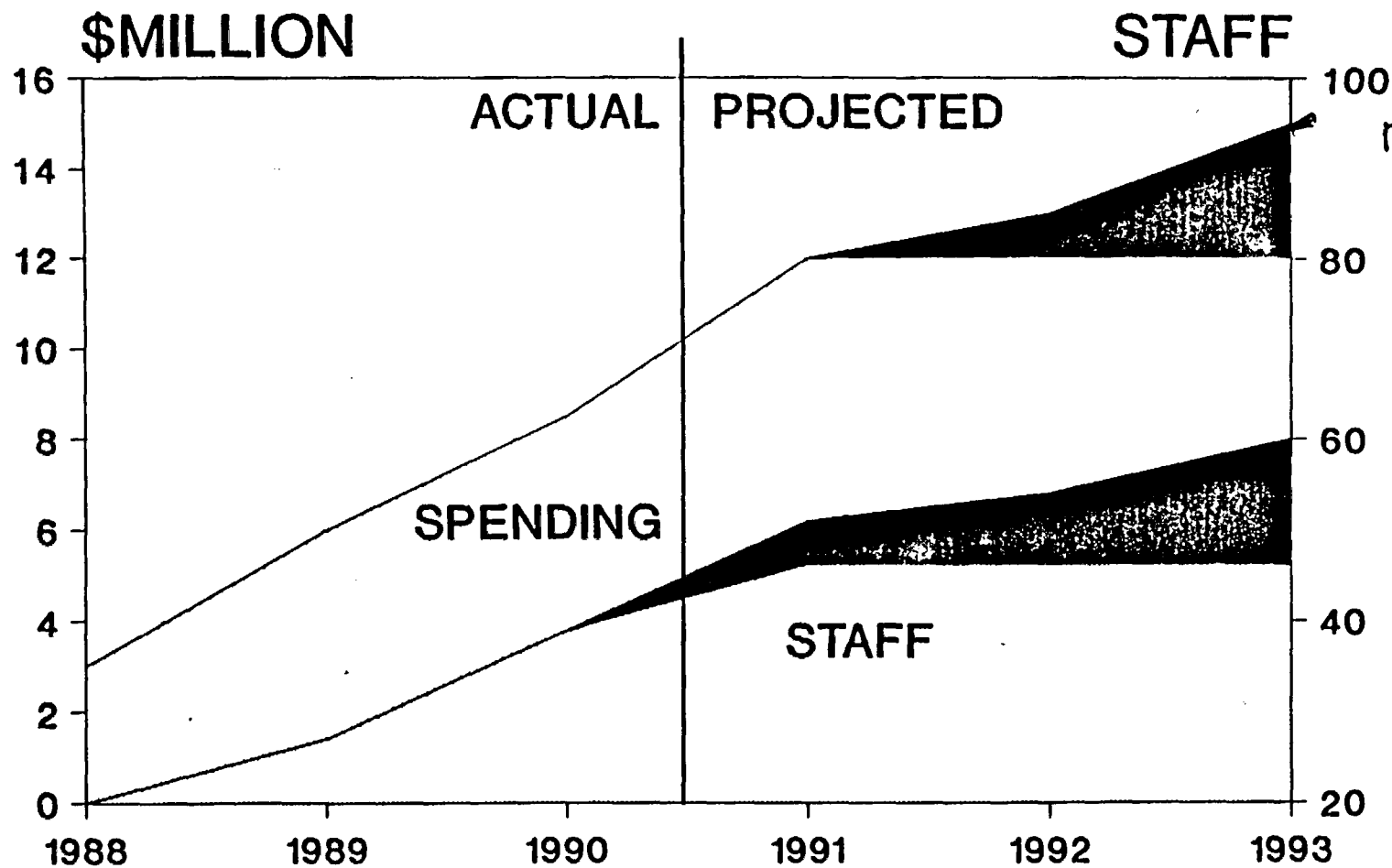
- o CURRENTLY YEAR 4 OF 5 YEAR
CONTRACT
- o CONTRACT RENEWAL DETERMINATION
PROCESS BEGUN
- KEY MILESTONES IDENTIFIED
- KEY SCHEDULE DATES PLANNED

staff paper due
to Commission
this summer -

K 10-97 — 10-92

SLIDE 10

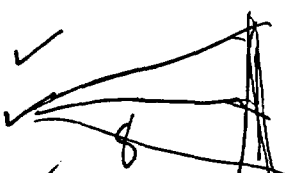
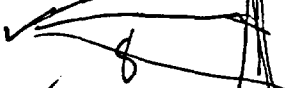



CNWRA SPENDING AND MANPOWER PROJECTIONS



13
\$3.3

SLIDE 11

CENTERS OF EXCELLENCE
STAFFING, FTE

	<u>3/1/91</u>	<u>Pro- jected</u>	<u>Long-Term Goal</u>	
GEOCHEMISTRY	5	6	6	
HYDROLOGY/CLIMATOLOGY	3	4	5	✓ 
ROCK MECHANICS/MINING	3	3	5	✓ 
MATERIAL SCIENCES	5	5	6	✓ 
STRUCTURAL/TECTONICS	5	5	7	✓ 
PERFORMANCE ASSESSMENT	3	5	7	✓ 
MECHANICAL & FACILITIES ENGINEERING	3	3	3	
SYSTEMS ENGINEERING	6	6	6	

SLIDE 12

PURPOSES OF BRIEFING

- o PROVIDE AN UPDATE ON THE STATUS OF THE CENTER**
- o DESCRIBE KEY ACCOMPLISHMENTS IN PROGRAMMATIC SUPPORT OF NRC**

SLIDE13

3/12/91

JRC

SCHEDULING NOTES

Title: Briefing on Activities of the Center for Nuclear Waste Regulatory Analysis (CNWRA) and Activities of the NRC in the HLW Program

Scheduled: 9:30 a.m. Thursday, March 14, 1991 (OPEN)

Duration: Approx. 2 hrs

Participants: NRC

- James Taylor 35 mins
- Robert Bernero
- J. Youngblood

Center for Nuclear Waste Regulatory Analysis (CNWRA)

- John Latz, President 20 mins
- Wesley Patrick, PhD, Technical Director 35 mins

Documents: - Viewgraphs issued 3/7, no paper