



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Reply to:

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M E M O R A N D U M

DATE: October 13, 1988

FOR: John J. Linehan, Chief, Project Management & Quality Assurance Branch (HLPM), Division of High-Level Waste Management

FROM: Paul T. Prestholt, Sr. OR - YMP
John Gilray, Sr. OR - YMP

PTP

SUBJECT: YMP Site Report for the month of September, 1988

I. QUALITY ASSURANCE

A. The Yucca Mountain Project Office (YMPO) has established a Management Review Board and Program Qualification Team to manage, expedite and monitor the implementation of a fully qualified QA program. Mr. Anthony Saca, YMPO is the Program Qualification Team Leader and will act under the direct supervision of Mr. Ed Wilmot, YMPO Deputy Manager.

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The Qualification Team approach is (from the handout):

- Emphasize line management commitment and responsibility;
- Does not change current QA organization responsibility, for example the QAP, QAPP, APQ....;
- Better control for project management.

This management tool should provide a more timely and active management overview of the qualified QA program activities and allow the YMPD QA organization, which previously shared some of these responsibilities, to concentrate more effectively in the development and review of the QA program controls. This office will monitor the operations of this team.

B. YMPD is establishing procedural controls to comply with NUREG 1318 "Technical Position on Items and Activities in the HLW Geologic Repository Program Subject to QA Requirements". We understand that this effort, which is expected to be complete in approximately four months, will provide a program categorizing items and activities either under the control of 10 CFR 50, Appendix B or not under the control of Appendix B. This should do away with the old Level 1, 2, and 3 categorization system. We intend to follow the progress and development of this program and periodically keep the Washington QA office informed.

C. Last month's report included John Gilray's input to the report of NRC's staff observations of YMPD's audit of REECO. As a result of further discussions with the NRC staff members it was mutually agreed that certain modifications to this report was appropriate. Consequently the NRC observation report was further revised and finalized which was reviewed and accepted by this office.

II. GEOLOGY

A. Prototype testing:

The objectives of prototype testing are (from the handout):

- o Develop and/or validate testing methods likely to be used for the characterization testing in the Exploratory Shaft Facility (ESF).
- o Insure that the test methodologies for the ESF testing will be established prior to performing tests in the ESF.
- o Develop implementation (QA) procedures.
- o Reduce the level of uncertainty for the site characterization testing in the ESF.
- o Develop procedures for data management.
- o To train personnel to conduct tests in the ESF and avoid false starts.

The following prototype test relating to geology were funded in FY 88:

- o Underground mapping;
- o Mineralogy/petrology;
- o Intact fracture;
- o Lab fracture analysis;
- o Air coring;
- o Air coring/dust hazards.

The enclosed handout discusses the status of each of the above.

B. Permission to deepen the Fran Ridge pit, to be used to test the "Full Periphery (photo) Mapping Method" has been received. However, there are no funds available to do this work.

III. HYDROLOGY

The prototype testing activities that relate to hydrology are (from the handout):

- Evaluation of the effects of wet and dry drilling fluids on the in situ hydrologic conditions of tuffaceous rocks in support of ESF testing.
- Drillhole instrumentation in support of ESF hydrologic testing.
- Cross-hole pneumatic and hydraulic testing in support of ESF hydrologic testing.
- Infiltration.
- Pore-water extraction by triaxial compression test.

See the enclosed handout for status of the above.

IV. GEOCHEMISTRY

Two prototype test activities in this area were funded. They are:

1. Prototype tracer testing (Gas and Water). The following has been accomplished:

- Conducted comprehensive literature search for suitable tracers.
 - Developed QA procedures for laboratory characterization of tuffaceous and tracer sorption behavior.
 - Selected bromide and iodide as tracers to compare with tritium and oxygen-18 (in water).
 - Performed preliminary laboratory test of borate sorption behavior on G-tunnel rocks.
2. Diffusion test. The following has been accomplished:
- Air cored vertical hole in G-tunnel to locate rubble zone beneath Grouse Canyon B layer.
 - Air cored vertical hole in Grouse Canyon for diffusion test.
 - Air cored vertical hole in Tunnel Bed 5 tuff for diffusion test.
 - Measured moisture content in drillholes to observe rehydration after air coring.
 - Air cored small diameter holes for diffusion tracer emplacement.
 - Built working system to inject 20 PPM BR-1 (tracer) into J-13 water supply line.

V. REPOSITORY ENGINEERING

Two prototype testing activities concerning repository engineering were funded for FY 88. These were:

1. Thermal stress test. Accomplishments to date are:

- Developed, fabricated and demonstrated flatjack pressure control system.
- Designed and fabricated new apparatus to mechanically feed the 1-M chain saw for cutting slots.
- Procured and evaluated thermal insulation system.
- Revised experimental procedure.

2. Engineered barrier test. Accomplishments to date are:

- This test has been commissioned for the horizontal mode.
- The heating phase of this test is scheduled to last about 23 weeks. The cooling phase will take 8 weeks.
- After the test has been completed, overcoring will be done at several locations to collect samples and to assess the instrumentation used.
- Data acquisition system is designed, fabricated and installed.

B. Exploratory shaft schedule. The DOE has made the following commitments:

- The project will analyze the effect of blasting on isolation before beginning the ESF.
- Specific procedures will be in place before beginning specific activities.

- Implementation audits, design verification and study plans will be performed and in place before beginning shaft construction.

DOE sees no risk to data quality if ESF construction is begun early in calendar 1989.

ESF Title I design is complete. The design effort consists of 84 design drawings, 76 design specification outlines and 53 design analysis/reports. The 100% Title I review is complete. The review resulted in 570 comments to F&S with agreeable resolution of 569. H&N is resolving 150 comments. The Title I construction estimate and schedule is complete.

The Title II Design Scope and Planning document is complete and consists of:

- The design scope.
- Deliverables: 350 drawings, 79 specifications, and 120 analysis/reports.
- Engineering cost estimate.
- Title II engineering schedule.

VI. WASTE PACKAGE

LLNL plans to issue the "Metal Barrier Selection Criteria" report in November. LLNL had an outside peer review of the report and input material. The peer review was set up and supervised by the lab's QA group. The only other lab personnel involved were those being reviewed. The peer reviewers were:

Robin Jones:

EPRI, Senior Program Manager; Chairman of EPRI BWR Materials Group; specialty is corrosion and mechanical properties. Served as Chairman of the peer review and recommended other reviewers.

Geoffrey Egan:

President, Aptech Engineering Services; formerly associated with the Welding Institute; specialty is welding and fabrication.

Richard Gangloff:

Professor, University of Virginia; formerly at the GE Research and Development Center; specialties are mechanical properties, physical metallurgy, and corrosion.

Robert Long:

Vice President for planning and Nuclear Safety, BPU Nuclear; Chief Utility Executive dealing with PWR material properties; specialty is physics.

Martin Prager:

Executive Director, Materials Property Council; specialty is physical metallurgy and corrosion.

Roger Staehle:

private consultant, adjunct professor at Minnesota, former Dean of Engineering at Minnesota; former Head of the Metallurgy Department at Ohio State.

VII. PERFORMANCE ASSESSMENT

There are no new activities since last month's report.

VIII. SITE ENVIRONMENT ACTIVITIES

The State of Nevada has given the green light to the project to deepen the Fran Ridge pit. This doesn't mean that the air quality permit requested by YMPD has been approved and issued, it only means that this one activity has been given an O.K.

IX. LICENSING AND NRC-DOE INTERACTIONS

A. On September 28, a meeting was held in Las Vegas concerning the Licensing Support System (LSS), the data bases presently in place within the Yucca Mountain Project and the John Linehan to Ralph Stein letter asking for NRC access to the YMP data bases.

Dr. Barbara Cerny, DOE-Hq, has the responsibility for the design of the LSS. She was interested in the data bases presently in place within the YMP and how the information held in these data bases will be made available to the LSS.

Dr. Cerny started the discussions by describing the LSS and indicating its level of maturity. The participation of the University of Nevada at Las Vegas was also discussed. A handout is enclosed that summarizes Dr. Cerny's remarks.

Sandia then discussed the three data management levels within the project:

- o Reference Information Base (RIB)--Identifies project baselined technical data and information; administered by SNL. (This data base is not presently fully operational).

- o Technical Data Base (TDB: SEPDB and IGIS) - Central project data base of site characteristics data (hard data); administered by SNL.
- o Local Records Centers (LCRs)--Participant-level processing of local technical (and other) records.

The RIB is:

- o The central project source of up-to-date reference technical information.
- o Included in the project technical baseline and subject to baseline control.
- o The information provided in the RIB is distilled from fully interpreted technical data and summarizes the current state of project development.
- o Continuous evolution through license application, with changes communicated through periodic updates.
- o User driven; user-identified needs are coordinated with data producing activities to define RIB content.

The RIB does not contain only level 1 data. It is expected, however, by the time a license application and SAR are written, the RIB will contain the data needed to justify a license.

The enclosed handout discusses the intended user of the RIB, its history and current development status. The handout also discusses the RIB organization and content, and change control procedures.

The "Site and Engineering Properties Data Base" (SEPDB).
The SEPDB is (from the handout):

- o a rational data base,
- o maintained on a dedicated VAX 8200 computer,
- o uses the Ingres data base management system,
and
- o is a service organization providing data retrievals
tailored to meet a particular need.

The SEPDB is oriented primarily toward the storage of rock properties and other location-specific site information. The principal organizing structure of the SEPDB is "by drill hole and depth."

The enclosed handout lists the types of data found in the SEPDB, a discussion of QA as applied to the data base, and how to put data into the data base and how to get it out.

No-one outside the Sandia organization has direct electronic access to the RIB or the SEPDB. NRC staff have had access in the same manner as the DOE program participants for several years. It is necessary to follow procedure (work order). It was stated that the YMP might give the staff a tape of all SEPDB data.

The YMP participants each presented a discussion of the "local data storage systems". The most mature seems to be the Sandia "Data Records Management System" (DRMS). Barry M. Schwartz is the manager and is willing to discuss the operation of the DRMS. Mr. Schwartz's phone number is (505) 846-8268.

Enclosed are handouts describing each of the local data storage systems.

B. Meetings attended:

- o September 1 Mitch Kunich, NVDD QA Manager J. Gilray
P.T. Prestholt
- o September 1 Mary McNabb, UNLV discussed University's role in LSS P.T. Prestholt
- o September 8 Steve Meta and others SAIC QA Division J. Gilray
P.T. Prestholt
- o September 13 Weekly meeting with Carl Gertz, YMFO Manager P.T. Prestholt
J. Gilray
- o September 20 Weekly meeting with Carl Gertz P.T. Prestholt
J. Gilray
- o September 22 TPO-Project Manager meeting P.T. Prestholt
J. Gilray
- o September 26 Meeting with John Price State Geologist, Nevada P.T. Prestholt
A.T. Cardone
- o September 27 To Test Site, field trip P.T. Prestholt
A.T. Cardone
- o September 28 LSS meeting P.T. Prestholt
- o September 28 Weekly meeting with Carl Gertz J. Gilray
- o September 29 Field trip - Crater Flat P.T. Prestholt
A.T. Cardone

C. Enclosed is a handout that discusses the "Administrative Procedure Manual" being prepared by YMFO.

Enclosed is a handout listing FY 89 project goals. Also, a handout listing WBS elements and the participant responsible.

X. SCP AND STUDY PLANS

The SCP is still on a late December, 1988 schedule. The project expects the document to be issued on schedule.

The weekly project reports forwarded contain up-to-date study plan information.

XI. STATE INTERACTIONS

There have been no interactions with the State of Nevada during September.

XII. MISCELLANEOUS

A. Max Blanchard, Wendy Dixon and Larry Skousen have been confirmed as Directors of their respective Divisions.

Dr. Uel Clanton has been confirmed as Branch Chief for Site Activities in Max Blanchard's Division.

B. Dr. Uel Clanton announced the following additions to the YMPD staff.

Alice Scammell:

Secretary. From 4th Army, Fort Sheridan, Illinois.

Claudia Newberry:

Geologist. From US Army Engineering Topographic Laboratories, Ft. Belvoir, VA. Specialty is remote sensing/terrain analysis/water resources analysis/mapping.

Thomas Bjerstedt:

Geologist. From University of St. Lawrence, NY. Taught a variety of undergraduate courses, including nuclear waste management.

Arch Girdley:

Geologist. From UNC Technical Services Inc., a DOE Contractor. Experience as manager of hazardous and mixed waste programs.

Chris Frederick:

Geologist. From the American Museum of Natural History. Specialities are copper/molybdenum deposits in Southern Arizona (Sierrita Mountains) and caldera/pre-caldera volcanics/mineralization.

Dick Crawley:

Geologist. From the NTS weapons program/test operations division.

Russ Dyer:

Structural Geologist. From University of Texas at El Paso.

Dr. Tom Hunter, Sandio TPO announced the following changes in his organization:

Bob Sandoval replaces Ron Pope. Bob is from SNL transportation program. He is currently assigned to long range planning.

Scott Sinnock is in Las Vegas as SNL's permanent representative. Les Shepherd replaced him at SNL in areas of databases, ground water travel time calculations, codes, and geostatistical drilling program.

cc: With enclosures: K. Stablein, R. E. Adler, J. E. Latz,
C . P. Gertz, R. R. Loux, M. Glora,
D. M. Kunihero, R. E. Browning, G. Cook,
L. Kovach, S. Gagner, K. Turner, J. Gilray

Enclosures: Fully Qualified Quality Assurance (QA) Program,
letter dated 9/13/88 from Carl P. Gertz; TFO Handouts, i.e.,
Agenda, Fully Qualified QA Program, Full Periphery Mapping
Method, Administrative Procedure Manual, TFO Presentation (Carl
Gertz), Prototype Testing Status Report (Hemi N. Kalia), FY 1989
Project Goals (Draft), SIG Document review, log, Worksheet,
Proposed WBS to match BCP-B-162, Underground Geologic Mapping;
DCRWM/Yucca Mountain Project Meeting for Technical Data
Management System Agenda and Handouts, i.e., Background, etc.,
Yucca Mountain Project Technical Data Management, etc., SEPDB
(Christopher A. Rautman, Sandia), The SNL NNWSI Project Data
Records Management System (Barry Schwartz), Data Management at
LANL (Herbst), T&MSS (SAIC, Westinghouse, Harza), QAPP/SIP, etc.,
History, etc.,



Department of Energy

Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

WBS #1.2.9.4
"QA"

SEP 13 1988

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Lawrence D. Ramspott, LLNL, Livermore, CA
Larry R. Hayes, USGS, Denver, CO
Donald T. Oakley, LANL, Los Alamos, NM
Thomas O. Hunter, SNL, 6310, Albuquerque, NM
Michael E. Spaeth, SAIC, Las Vegas, NV
Joseph C. Calovini, H&N, Las Vegas, NV
Robert F. Pritchett, REECo, Mercury, NV
Richard L. Bullock, F&S, Las Vegas, NV
Addanki M. Sastry, MACTEC, Las Vegas, NV

FULLY QUALIFIED QUALITY ASSURANCE (QA) PROGRAM

The Yucca Mountain Project Office (Project Office) is in the process of establishing a Management Review Board and a Program Qualification Team for the purpose of managing, expediting, and monitoring the implementation of a fully qualified QA program. During the next few weeks, members of the team will be contacting the program participants to develop schedules for implementation of a fully qualified QA program. Initially, team members will include representatives from the Project Office and MAC Technical Services. As the activities progress, the participants may be requested to provide direct support.

An organization chart is enclosed showing the participation and organizational relationships. The chart reflects line management commitment to QA program implementation. Full support and participation of the Technical Project Officers will be necessary. This action does not diminish or alter the responsibility of the QA organizations for developing and approving the required project QA documents including QA administrative procedures.

Anthony Baca, Project Office, has been assigned as the Program Qualification Team Leader with the direct management and oversight of Ed Wilmot. Under the direction of the Management Review Board, Mr. Baca will be the single point of responsibility for all efforts required to achieve a fully qualified QA program for the Project Office and the participants. His assignment carries the authority necessary to execute all aspects of the program. A table of QA program qualification milestones is enclosed for your information and appropriate action. Your assistance and cooperation with Mr. Baca will be appreciated.

SEP 13 1988

Multiple Addressees

-2-

If you have any questions, please contact Anthony L. Baca at (702) 794-7960 or FTS 544-7960.



Carl P. Gertz, Project Manager
Yucca Mountain Project Office

YMP:ALB-3622

Enclosures:

1. Organization Chart
2. QA Program Qualification

cc w/encls:

E. L. Wilmot, YMP, NV
M. B. Blanchard, YMP, NV
W. R. Dixon, YMP, NV
L. P. Skousen, YMP, NV
James Blaylock, YMP, NV
A. L. Baca, YMP, NV

**MANAGEMENT
REVIEW BOARD**
Chairman: Project Manager
Vice Chariman: Dy Proj Manager
Members: Division Directors

Program Qualification
Team Leader

TPOs

MACTEC
Support Group

- o Planning & Scheduling
- o Overviews
- o Assessments
- o etc.

Multi-Organizational Task
Group (Draw from participants
as necessary)

- Assistance in required areas
such as:
- o Procedure writing
 - o Training
 - o Assessments
 - o Etc.
- (Future - if required)

QA PROGRAM QUALIFICATION

PRIORITIES

9/15	Establish structured decision making process - Management Review Board	Project Office
*9/21	Team Leader Presentation to TPOs	Project Office /Participants
9/30	Verify participant schedules	Project Office /Participants
*9/30	Status to Management Review Board	Project Office /Participants
10/15	Assessments as necessary	Project Office /Participants
10/21	Update/validate schedule	Project Office
*10/30	Develop and analyze plan	Project Office /Participants
10/30	Alternatives, potential management actions for MRB decision	Project Office
*	Project Manager participation	

NNWSI PROJECT MANAGER-TECHNICAL - PROJECT OFFICER MEETING

LOCATION: 101 Convention Center Drive

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Las Vegas, Nevada

DATE: SEPT. 22, 1988

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Thursday September 22 9:00- 9:15	INTRODUCTION/ROLES AGENDA/OUTCOMES	AROUND THE ROOM REVIEW/REVISE/AGREE	ALL LINDA/ALL	AGREE TO AGENDA AND OUTCOMES	7/88 MINUTES
	MINUTES/JULY	ADJUST, AGREE	LINDA	AGREE TO APPROVE MINUTES	
9:15- 9:30	UPDATE ON FULLY QUALIFIED QA PROGRAM	PRESENT UPDATE ON QA PROGRAM QUALIFICATION	ANTHONY BACA	UNDERSTAND STATUS OF FULLY QUALIFIED QA PROGRAM	
9:30- 9:45	UPDATE ON LONG RANGE PLANNING PROCESS	PRESENT STATUS OF LONG RANGE PLANNING PROCESS	VINCE IORII	UNDERSTAND STATUS OF LONG RANGE PLANNING PROCESS	
9:45-10:15	MANAGER FYI's	PRESENT FYI's	CARL GERTZ	UNDERSTAND STATUS OF FYI ITEMS	
10:15-10:45	FYI's	PRESENT 5 MINUTE FYI's AROUND THE TABLE	DIVISION DIRECTORS/TPO's /ALL	UNDERSTAND STATUS OF FYI ITEMS	
10:45-11:00	BREAK				
11:00-11:45	ACCOMPLISHMENTS IN PROTOTYPE TESTING	SUMMARIZE TESTING ACCOMPLISHMENTS BY ALL PARTICIPANTS	HEMI KALIA	UNDERSTAND ACCOMPLISHMENTS IN PROTOTYPE TESTING	

A T I D A
NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-028
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LOCATION: 101 Convention Center Drive

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Las Vegas, Nevada

DATE: SEPT. 22, 1988

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Thursday September 22 11:45-12:00	PROCEDURES STATUS	PRESENT PROCEDURE STATUS AS WELL AS PLANS THEY FALL OUT OF, ORGANIZATION, AND RESPONSIBILITIES	LLOYD KRIVANEK	UNDERSTAND STATUS OF PROCEDURES	
12:00- 1:00	LUNCH				
1:00- 1:30	QMP-06-03, DOCUMENT REVIEW	PRESENT RELATIONSHIP OF QMP-06-03 DOCUMENT REVIEW TO AP 1.3Q	JOHN WADDELL	UNDERSTAND RELATIONSHIP BETWEEN QMP-06-03 AND AP 1.3Q	
1:30- 2:00	DESIGN REQUIREMENTS DOCUMENTS	DESCRIBE HOW REQUIREMENTS FIT INTO THE BASELINE, DESCRIBE CONTENT OF REQUIREMENTS DOCUMENTS, AND PROVIDE STATUS	TED PETRIE	UNDERSTAND CONTENT OF DESIGN REQUIREMENTS DOCUMENTS AND HOW REQUIREMENTS FIT INTO BASELINE	
2:00- 2:30	SCP UPDATE	PRESENT STATUS OF SCP	MAX BLANCHARD	UNDERSTAND STATUS OF SCP	
2:30- 2:45	UPDATE ON ATOMIC ENERGY CANADA LIMITED (AECL) AND DOE/NAGRA (SWITZERLAND) TECHNICAL COMMITTEE MEETING	PRESENT STATUS OF AECL AND TALK ABOUT DOE/NAGRA MEETING IN LAS VEGAS ON OCTOBER 3-4	BOB LEVICH	UNDERSTAND STATUS OF AECL AND INFORM TPOs OF NAGRA MEETING TO MOVE TOWARDS SELECTING DELEGATES	

NNWSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

N-AD-02R
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LOCATION: 101 Convention Center Drive

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Las Vegas, Nevada

DATE: SEPT. 22, 1988

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
Thursday September 22 2:45- 3:00	REVIEW UPCOMING AGENDA ITEMS REVIEW ACTION ITEMS				

UNDERGROUND GEOLOGIC MAPPING
Prototype Testing and ESF Activities

Description and Purpose - Mapping in the shafts and drifts will provide a detailed description of stratigraphic, lithologic, and structural features. These data are the foundation of site characterization.

FY 88 Objectives - Develop and test equipment and procedures for field data acquisition. Install and test hardware and software for processing field data and continue developing and testing methods of storing and presenting data to users. Also continue QA activities and write ES procedures.

Accomplishments - The following has been accomplished in addition to the usual management and QA activities.

Planning Documents

Activity Plan - The Activity Plan was completed.

Exploratory Shaft Test Plan - The Exploratory Shaft Test Plan was extensively revised.

Data Acquisition Equipment and Procedures

Camera testing - The two types of appropriate photogrammetric cameras available were tested for resolution, operation, etc. and various film types were tested.

Drift wall mapping - Prototype testing is complete and resulted in development of:

- (1) Strike rail and mounts
- (2) Rotating Camera mount and integral flash mount
- (3) Strike rail orientation targets
- (4) Pyramid laser beam deflector-splitter (patent)
- (5) Laser goniometer (patent)
- (6) Photogrammetry target placement methods and targets
- (7) ESF mapping procedures drafted

These items are complete; the equipment must now be acquired in the necessary quantities at QA Level 1 for ESF mapping.

Shaft wall mapping - Prototype testing is incomplete (see below for reason), work to date has resulted in the development of:

- (1) Radial arm strike rail assembly (patent)
- (2) Telescoping camera mount and integral flash mount

Note that some of the equipment developed and tested as part of drift mapping will be used for shaft mapping also.

Photogrammetry Laboratory

- (1) Installation of Kern DSR-11 Analytical Stereoplotter, DEC MicroVAX II/VAXstation II GPX cluster, and graphics editing workstations 95% complete
- (2) Installation of commercial support software including operating system, database, geographical information system, and the analytical plotter operating system 95% complete
- (3) Application software development is well along for multi-model orientation, fracture orientation measurement, data collection to data storage translation, and database application design

All the accomplishments are steps required to obtain acceptable data and apply the results to repository site characterization.

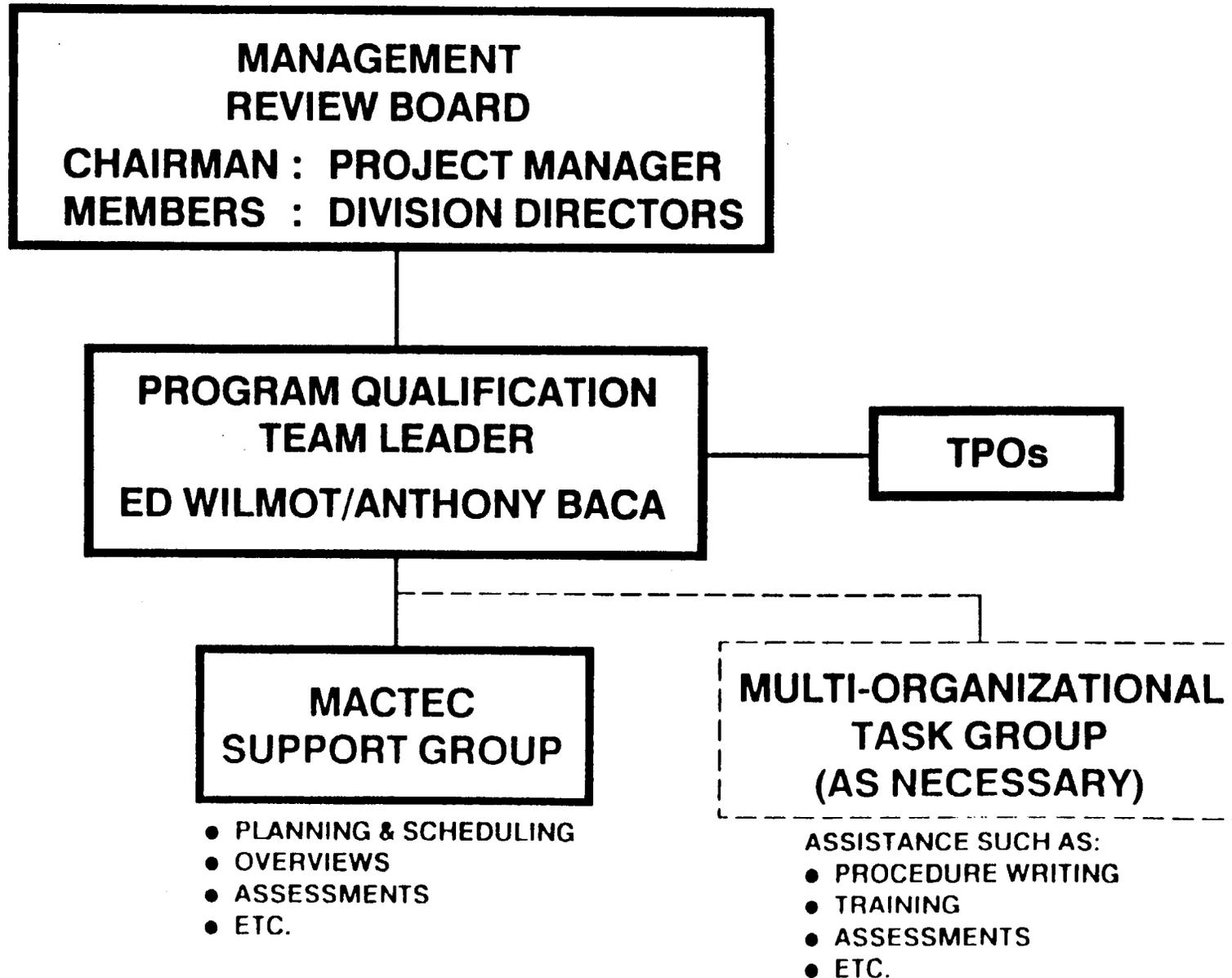
Shortfalls - An active work order is in place for the accomplishment of prototype shaft mapping testing but the work has been delayed for approximately five months because an air quality permit had not been obtained from the state of Nevada. This prototype testing should start in October. Quality assurance requirements for auxiliary software have been changed to essentially the same as engineering and scientific software within the last two months. A concerted effort by two software QA FTE's is necessary as soon as possible to meet schedules.

Plans and Objectives - FY 89

- (1) Complete prototype shaft mapping testing and prepare final procedures for both drift and shaft mapping in the ES
- (2) Acquire necessary equipment at QA Level 1 for ES mapping
- (3) Complete Quality Assurance requirements, especially for software (see shortfalls above)
- (4) Acquire equipment for completion of the analytical plotter mapping system, complete installation and prepare final procedures
- (5) Prepare the Detailed Test Plan for Underground Geologic Mapping
- (6) Acquire and train personnel for ESF mapping

**FULLY QUALIFIED
QA PROGRAM**

ORGANIZATION



QUALIFICATION TEAM APPROACH

- **EMPHASIZES LINE MANAGEMENT COMMITMENT AND RESPONSIBILITY**
- **DOES NOT CHANGE CURRENT QA ORGANIZATION RESPONSIBILITY, EG. QAP, QAPP, APQ, ...**
- **BETTER CONTROL FOR PROJECT MANAGER**

QA PROGRAM QUALIFICATION

PRIORITIES

9/15	ESTABLISH STRUCTURED DECISION MAKING PROCESS - MANAGEMENT REVIEW BOARD (MRB)	PROJECT OFFICE
9/21*	TEAM LEADER PRESENTATION TO TPOs	PROJECT OFFICE/ PARTICIPANTS
9/30	VERIFY PARTICIPANT SCHEDULES	PROJECT OFFICE/ PARTICIPANTS
9/30	STATUS TO MRB	PROJECT OFFICE/ PARTICIPANTS
10/15*	ASSESSMENTS AS NECESSARY	PROJECT OFFICE/ PARTICIPANTS
10/21	UPDATE/VALIDATE SCHEDULE	PROJECT OFFICE
10/30	DEVELOP AND ANALYZE PLAN	PROJECT OFFICE/ PARTICIPANTS
10/30*	ALTERNATIVES, POTENTIAL MANAGEMENT ACTIONS FOR MRB DECISION	PROJECT OFFICE

* PROJECT MANAGER PARTICIPATION

FULL PERIPHERY MAPPING METHOD

This method is widely used in present engineering practice and involves creating a map of the surface of the underground excavation. The method produces a map which is virtually free of the distortion present in other methods where geologic features are projected onto an imaginary plane. It has been used successfully in various types and shapes of excavations (Hatheway, 1982; U.S. Army Corps of Engineers, 1970; Proctor, 1971).

The method uses a developed surface created by "unrolling" or "flattening out" the circumference of the tunnel or shaft to form a plan of the entire wall surface. The geologic features are plotted on this plan as excavation progresses. The method is especially effective in that geologic features of all types can be entered without bias onto the map regardless of orientation or location. The method is useful for plotting, curving, or irregular discontinuities which are difficult to project to a flat plane as in other methods.

Procedure: This method generally requires the assembly of field sheets prior to the actual start of mapping. This is done for drifts and tunnels by first drawing in the crown centerline of the plan. The base of the wall or the invert centerline are then plotted at a circumferential distance from the crown centerline on the plan. For instance, if the tunnel is 10 feet in excavated diameter, the invert centerline will be plotted 15.71 feet (in scale) from the crown centerline. The spring line is then also plotted the appropriate circumferential distance from the crown centerline (see figs. 1 and 2). This process is done for both walls, producing a plan which represents the actual wall surface of the excavation. Horizontal scales are then added on either side of the plan to provide distance control while plotting. A longitudinal section view of the excavation may be added alongside the plan to provide a space to record types and locations of support if desired.

Advantages

1. This method involves plotting the actual traces of geologic features as they are exposed in the tunnel. This eliminates the distortion caused by other methods where the traces are projected back to a plane tangential to the tunnel.

2. This method allows the geologist to plot and observe irregularities in geologic features and make accurate three-dimensional interpretations of the features.

3. This method allows rapid and easy plotting of the locations of samples and photographs.

4. This method allows easy and rapid recording of the locations of rock bolts and other types of rock reinforcement.

Disadvantages

1. Since the surface of the excavation is generally a curved surface, the trace of planar features such as fractures, faults, and bedding planes produce curves when plotted on the map. These may, at first, appear strange to those unfamiliar with this type of mapping.

2. As discussed previously, this method requires that the points at which features intersect the spring line must be projected to the original tunnel diameter in order to compute the true strike of the discontinuity.

FULL PERIPHERY MAPPING METHOD

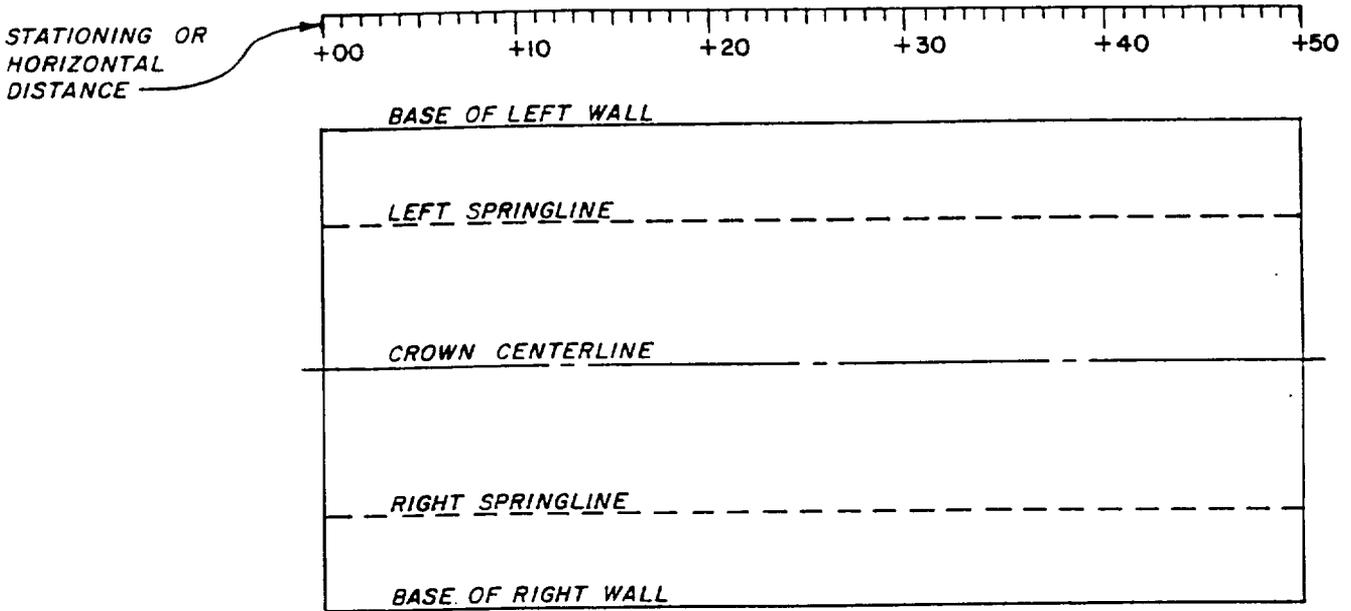


FIGURE 1

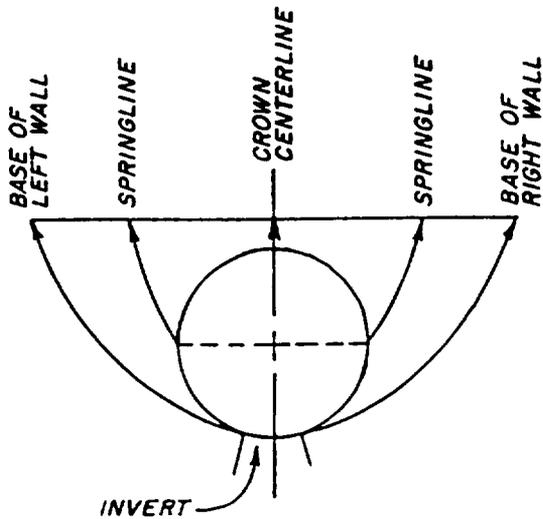
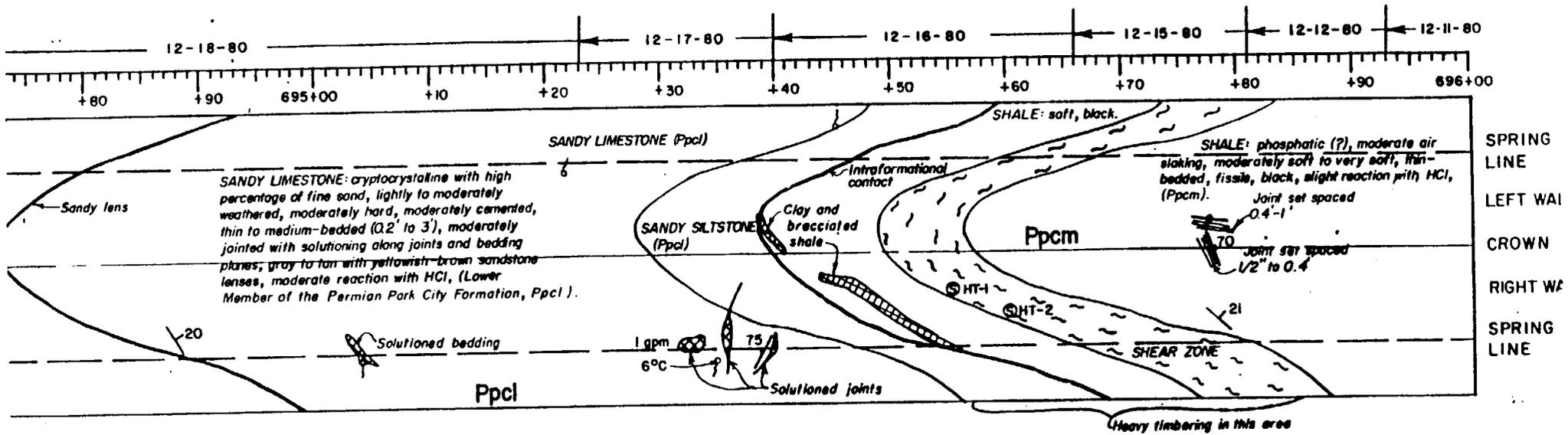


FIGURE 2



EXAMPLE OF FULL PERIPHERY MAPPING METHOD
FROM MACHINE EXCAVATED TUNNEL

Administrative Procedure Manual

- SECTION I - HARD COPY OF VIEWGRAPHS
- SECTION II - APM TABLE OF CONTENTS
- SECTION III - GANT CHART SCHEDULE OF APs
IN PROGRESS
- SECTION IV - PROJECT PROGRESS REPORT
- SECTION V - PLANS RELATED TO IMPLEMENTING
PROCEDURES AND QAP CRITERIA

I

APM

- CONTROLLED ORGANIZATION CHARTS
- APPENDICES
- APS
 - NON-QUALITY RELATED (AP)
 - QUALITY RELATED (APQ)

RESPONSIBILITIES

YUCCA MOUNTAIN PROJECT OFFICE

- PROJECT CONTROL BRANCH

T&MSS

- PLANS & PROCEDURES BRANCH

STATUS

- **HANDOUT HAS SCHEDULE OF APs AND APQs**

REVIEWS

PROJECT OFFICE

- EVALUATING PROCESS; NEEDS EXPEDITING,
SIMPLIFYING
- BEST CASE - 7 WEEKS FOR FORMAL PROJECT
REVIEW/APPROVAL

TPO REVIEW OPTIONAL

WHAT'S NEXT?

- SINGLE CONTACT POINT
 - PROJECT OFFICE
 - T&MSS

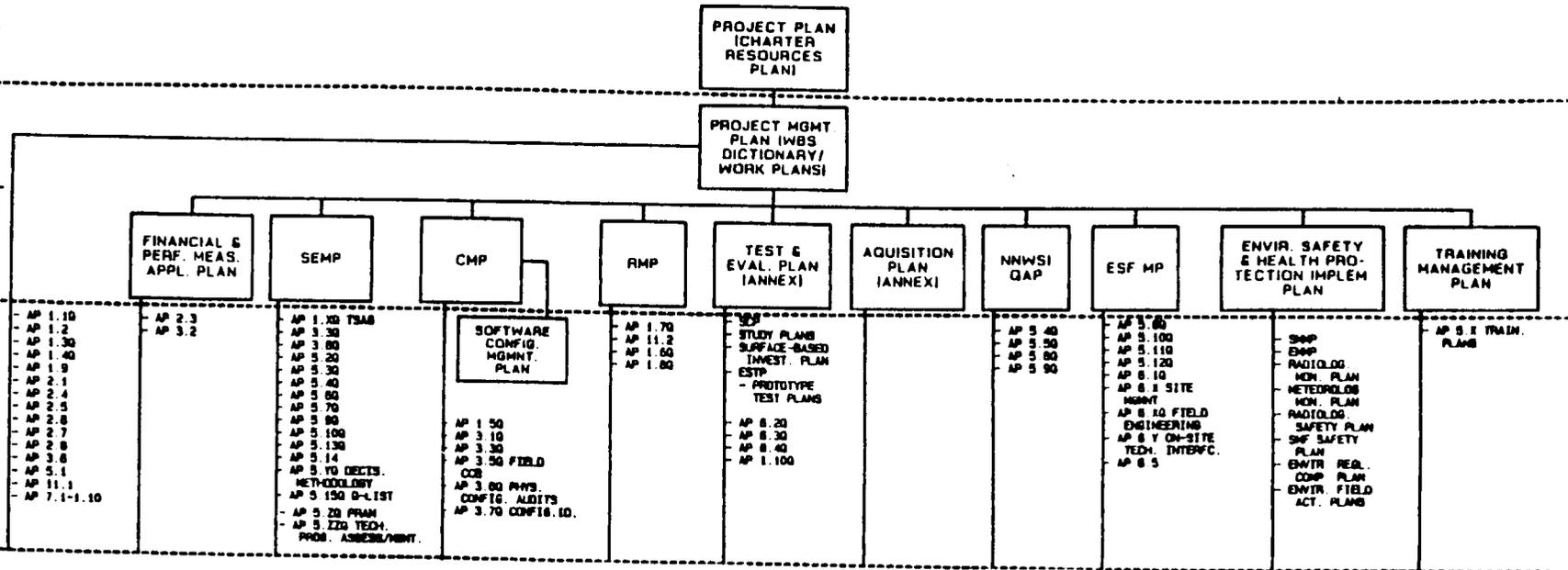
FOR ALL APs, APQs, QMPs, BTPs

- MONTHLY REPORT/SCHEDULE
- REVISING APM INTRODUCTION
 - RELATE APs TO DOCUMENT HIERARCHY/APQs
TO 18 CRITERIA (QAP)

**PROGRAM POLICIES
& REQUIREMENTS -
NV COMMITMENT TO HQ**

**PROJECT POLICIES
& REQUIREMENTS TO
MEET HQ/WMPO COMMIT-
MENTS TO NV:
'WHAT' WILL BE DONE
& HOW MANAGED**

**IMPLEMENTING
PLANS & PROCE-
DURES WMPO
DIRECTION TO
PROJECT ON 'HOW'
UPPER LEVEL PLANS
WILL BE SATISFIED**

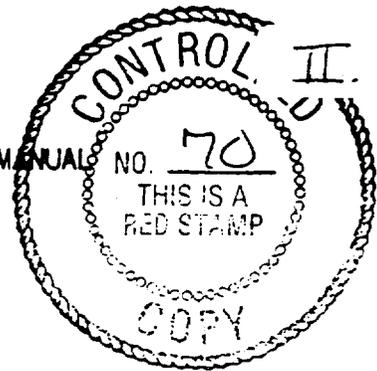


- **INTEGRATING AP_s/APQ_s**
- **ARE DEVELOPING FULL IMPLEMENTING PLANS FOR ALL PROJECT LEVEL DOCUMENTS**

II.

Uncontrolled

NNWSI PROJECT ADMINISTRATIVE PROCEDURES MANUAL



NNA.880902.0007

TABLE OF CONTENTS

<u>Category/Title</u>	<u>Implementation Status</u>
INTRODUCTION	8/15/88 (Rev. 1) Issued
PROJECT ORGANIZATIONS	7/5/88 (Rev. 1) Issued
PO-1 Nevada Nuclear Waste Storage Investigations Project Organization	7/5/88 (Rev. 1) Issued
PO-2 United States Department of Energy - Nevada Operations Office Organization	7/5/88 (Rev. 1) Issued
PO-3 Waste Management Project Office Organization	7/5/88 (Rev. 1) Issued
PO-4 Los Alamos National Laboratory Organization	7/5/88 (Rev. 1) Issued
PO-5 Lawrence Livermore National Laboratory Organization	7/5/88 (Rev. 1) Issued
PO-6 Sandia National Laboratories Organization	7/5/88 (Rev. 1) Issued
PO-7 United States Geological Survey Organization	7/5/88 (Rev. 1) Issued
PO-8 Science Applications International Corporation Technical and Management Support Services Organization	8/15/88 (Rev. 2) Issued
PO-9 Fenix and Scisson Organization	7/5/88 (Rev. 1) Issued
PO-10 Holmes and Narver Organization	7/5/88 (Rev. 1) Issued
PO-11 Reynolds Electrical and Engineering Company Organization	7/5/88 (Rev. 1) Issued
AP 1 COMMUNICATIONS AND INFORMATION EXCHANGE	
AP-1.1Q Administrative Procedure Preparation	6/3/87 (Rev. 1) Issued
AP-1.2 Conduct and Minutes of TPO Meeting	1/15/85
AP-1.3Q Publications Review and Approval	4/11/88 (Rev. 1) Issued
AP-1.4 Distribution of Information Products	7/27/87 (Rev. 1) Issued
AP-1.5Q Issuance and Maintenance of Controlled Documents	4/11/88 (Rev. 0) Issued
AP-1.6Q Release of Unpublished Information	6/17/88 (Rev. 0) Issued
AP-1.7Q Records Management	8/15/88 (Rev. 0) Issued
AP-1.8Q Management of State of Nevada Requests for Project Data Items	In Preparation
AP-1.9 Waste Management Project Office (WMPD) Action Item Tracking System	11/24/87 (Rev. 0) Issued
AP-1.10Q Preparation, Review, and Approval of SCP Study Plans	In Preparation

Uncontrolled

Category/Title

Implementation Status

AP 2 REPORTING REQUIREMENTS

AP-2.1	Weekly Informal Report	6/17/88 (Rev. 1) Issued
AP-2.3	Major System Acquisitions Report	1/15/85
AP-2.4	NNWSI Project Quarterly Technical Report	1/15/85
AP-2.5	NNWSI Project Monthly Report	1/15/85
AP-2.6	NNWSI Project Bibliography	1/15/85
AP-2.7	Monthly Forecast Calendar	1/15/85
AP-2.8	Monthly Technical Data Transfer Report	9/29/87 (Rev. 0) Issued

AP 3 PROJECT BASELINE PLANNING

AP-3.1	Planning and Scheduling Baseline	1/15/85
AP-3.2	Monthly Reporting and Analysis	1/15/85
AP-3.3	Change Control Process	1/15/85
AP-3.4Q	Technical Element of the Project Baseline	In Preparation
AP-3.5Q	Field Change Control Board	In Preparation
AP-3.6Q	Physical Configuration Audits	In Preparation
AP-3.7Q	Configuration Identification	In Preparation

AP 4 PROCUREMENT

AP 5 PROJECT CONTROL

AP-5.1Q	Project Commitment Tracking System (PCTS) Procedures	In Preparation
AP-5.2Q	Technical Information Flow to and from the NNWSI Site and Engineering Properties Data Base	In Preparation
AP-5.3Q	Information Flow into the NNWSI Project Reference Information Base	In Preparation
AP-5.4Q	QALAs for NNWSI Project Activities	In Preparation (repl. SOP)
AP-5.5Q	Software Quality Assurance	In Preparation (repl. SOP)
AP-5.6Q	Exploratory Shaft Facility Technical Elements Baseline and Interface Control Procedure	7/5/88 (Rev. 0) Issued
AP-5.7Q	Site Integration Interface Control	In Preparation (repl. SOP)
AP-5.8Q	QA Management Assessment	In Preparation
AP-5.9Q	Acceptance of Data and Data Interpretation Not Generated Under the NNWSI Project QA Plan	In Preparation (repl. SOP)
AP-5.10Q	Use of NTS Contractors on the NNWSI Project	8/30/88 (Rev. 0) Issued

Uncontrolled

Category/Title

Implementation Status

AP-5.11Q	Calibration of Measuring and Test Equipment by NTS Support Contractors	In Preparation
AP-5.12	T&MSS Technical Support Representatives for the NNWSI Project Exploratory Shaft Facility	6/17/88 (Rev. 0) Issued
AP-5.13Q	Readiness Review	In Preparation
AP-5.14Q	Design Reviews	In Preparation
AP-5.15Q	Methodology for Q-List Development	In Preparation

AP 6 OPERATIONAL PROCEDURES

AP-6.1Q	Technical Assessment Reviews for the NNWSI Project Exploratory Shaft Facility (ESF)	In Preparation
AP-6.2Q	Field Logging and Documentation of NNWSI Project Borehole Samples	In Preparation
AP-6.3Q	Use of the Sample Management Facility by NNWSI Project Participants	In Preparation
AP-6.4Q	Preparation of Pre-Drilling Documentation for NNWSI Project Boreholes	In Preparation
AP-6.5	Cost Estimating for the Nevada Nuclear Waste Storage Investigations (NNWSI) Project Exploratory Shaft Facility (ESF)	In Preparation
AP-6.6Q	Field Collection, Documentation, and Specimen Removal of Exploratory Shaft and Drift Rock	In Preparation

AP 7 NRC INTERACTION PROCEDURES

AP-7.1	Conduct and Documentation of NRC Meeting	In Preparation
AP-7.2	Attendance at Technical Meetings with the NRC Conducted by Other Projects	In Preparation
AP-7.3	Scheduling and Preparation for NNWSI Project/NRC Technical Meetings	In Preparation
AP-7.4	Scheduling and Preparation for NNWSI Project/NRC Management Meetings	In Preparation
AP-7.5	Controlling Data Release	In Preparation
AP-7.6	Communications with the NRC	In Preparation
AP-7.7	NNWSI Project Interactions with the NRC Onsite Representative (OR)	In Preparation
AP-7.8	Report Inventory	In Preparation
AP-7.9	Field and Laboratory Testing Schedule	In Preparation
AP-7.10	Data Catalog	In Preparation

Uncontrolled

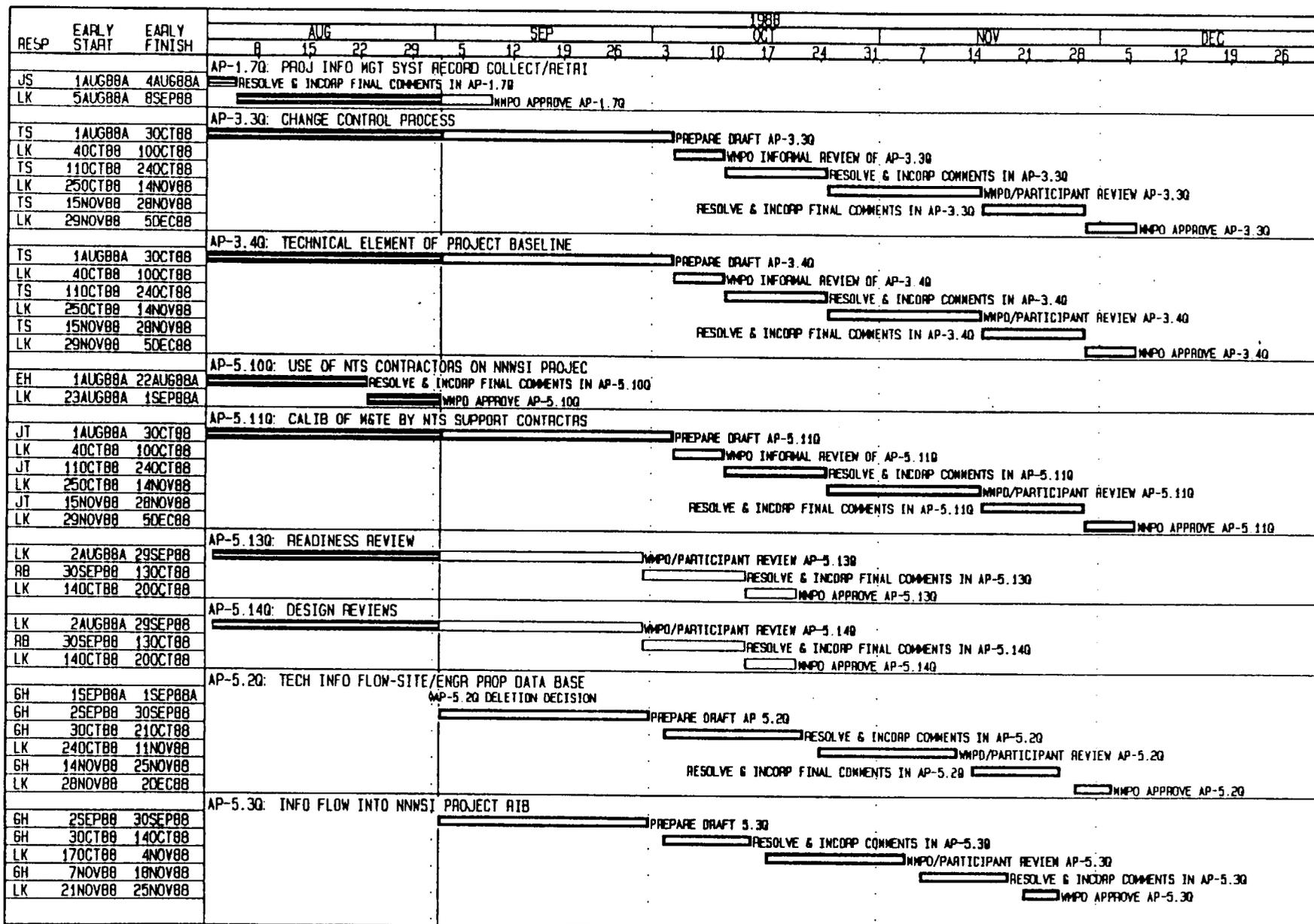
<u>Category/Title</u>	<u>Implementation Status</u>
APPENDIX A: Morgan-Davis DOE/HQ-NRC Agreement	
APPENDIX B: NRC/DOE Site Specific Agreement	
APPENDIX C: DOE/BLM Memorandum of Understanding	Contents Deleted 4/11/88
APPENDIX D: DOE/BLM Right-of-Way Reservation	(Rev. 1) Contents Replaced 4/11/88
APPENDIX E: DOE/Nellis Air Force Base Permit	
APPENDIX F: Public Affairs Plan	
APPENDIX G: Acronyms	Contents Added 6/17/88
APPENDIX H:	Unused

Uncontrolled

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
Figure P0-1.	Nevada Nuclear Waste Storage Investigations Project Organization	4
Figure P0-2.	United States Department of Energy - Nevada Operations Office Organization.	5
Figure P0-3.	Waste Management Project Office Organization	6
Figure P0-4.	Los Alamos National Laboratory Organization.	7
Figure P0-5.	Lawrence Livermore National Laboratory Organization.	8
Figure P0-6.	Sandia National Laboratories Organization	9
Figure P0-7.	United States Geological Survey Organization	10
Figure P0-8.	Science Applications International Corporation Technical and Management Support Services Organization . .	11
Figure P0-9.	Fenix and Scisson Organization	18
Figure P0-10.	Holmes and Narver Organization	19
Figure P0-11.	Reynolds Electrical and Engineering Company Organization .	20

III



Activity Bar/Early Dates
 Critical Activity
 Progress Bar
 Primavera Systems, Inc. 1984, 1985, 1986, 1987

WASTE MANAGEMENT PROJECT OFFICE
NNWSI ADMINISTRATIVE PROCEDURES
ADMINISTRATIVE PROCEDURES (APQ)
 Project Start : 1AUG88
 Project Finish: 31OCT88

Sheet 1 of 3

ADMINISTRATIVE PROCEDURES SCHEDULE

Make	Revision	Checked	Approved

Data Date: 2SEP88
Plot Date: 19SEP88

RESP	EARLY START	EARLY FINISH	1988																				
			AUG			SEP			OCT			NOV			DEC								
			8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26
GMP-02-01: INDOCTRINATION & TRAINING			RESOLVE & INCORP COMMENTS IN GMP-02-01																				
MF	1AUG88A	12AUG88A	WMPD APPROVE GMP-02-01																				
LK	2SEP88	8SEP88																					
GMP-02-06: ASSIGNMENT OF QA LEVELS			RESOLVE & INCORPORATE COMMENTS IN GMP-02-06																				
JT	1AUG88A	31AUG88A	WMPD APPROVE GMP-02-06																				
LK	1SEP88A	8SEP88																					
GMP-02-XX: QUALIF OF INSTRUCTIONAL STAFF			PREPARE DRAFT GMP-02-10																				
MF	1AUG88A	30CT88	WMPD INFORMAL REVIEW OF GMP-02-XX																				
LK	4OCT88	10OCT88	RESOLVE & INCORP COMMENTS IN GMP-02-10																				
MF	11OCT88	24OCT88	WMPD APPROVE GMP-02-XX																				
LK	25OCT88	31OCT88																					
GMP-03-01: PEER REVIEW			RESOLVE & INCORP COMMENTS IN GMP-03-01																				
RB	1AUG88A	28OCT88	WMPD APPROVE GMP-03-01 REV 1																				
LK	31OCT88	4NOV88																					
GMP-03-02: SCIENTIFIC INVESTIGATION CONTROL			RESOLVE & INCORPORATE COMMENTS ON GMP-03-02 R1																				
RK	1AUG88A	29SEP88	WMPD APPROVE GMP-03-02																				
LK	30SEP88	6OCT88																					
GMP-03-03: USE AND CONTROL OF COMPUTER PROGRAMS			PREPARE DRAFT GMP-03-03																				
RC	1AUG88A	1NOV88	WMPD INFORMAL REVIEW OF GMP-03-03																				
LK	2NOV88	8NOV88	RESOLVE & INCORP COMMENTS ON GMP-03-03																				
RC	9NOV88	22NOV88	WMPD APPROVE GMP-03-03																				
LK	23NOV88	29NOV88																					
GMP-03-04: SOFTWARE DEVELOPMENT AND MAINTENANCE			PREPARE DRAFT GMP-03-04																				
RC	1AUG88A	30CT88	WMPD INFORMAL REVIEW OF GMP-03-04																				
LK	4OCT88	10OCT88	RESOLVE & INCORP COMMENTS IN GMP-03-04																				
RC	11OCT88	24OCT88	WMPD APPROVE GMP-03-04																				
LK	25OCT88	31OCT88																					
GMP-03-05: VERIF & VALIDATION OF COMPUTER PRGMS			PREPARE DRAFT GMP-03-05																				
RC	12AUG88A	30AUG88A	WMPD INFORMAL REVIEW OF GMP-03-05																				
LK	2SEP88	8SEP88	RESOLVE & INCORP COMMENTS IN GMP-03-05																				
RC	9SEP88	22SEP88	WMPD APPROVE GMP-03-05																				
LK	23SEP88	29SEP88																					
GMP-03-06: SOFTWARE CONFIG CHANGE & MGMT CONTROL			PREPARE DRAFT GMP-03-06																				
RC	1AUG88A	1DEC88	WMPD INFORMAL REVIEW OF GMP-03-06																				
LK	2DEC88	8DEC88	RESOLVE & INCORP COMMENTS ON GMP-03-06																				
RC	9DEC88	22DEC88	WMPD APPROVE GMP-03-06																				
LK	23DEC88	29DEC88																					
GMP-04-02: PROCURMT DOCMT CNTRL (WMPD INITIATED)			PREPARE DRAFT GMP-04-02																				
JR	1AUG88A	9SEP88	WMPD INFORMAL REVIEW OF GMP-04-02																				
LK	12SEP88	16SEP88	RESOLVE & INCORP COMMENTS IN GMP-04-02																				
JR	19SEP88	30SEP88	WMPD APPROVE GMP-04-02																				
LK	30CT88	7OCT88																					
GMP-06-02: DOCUMENT CONTROL			RESOLVE & INCORP COMMENTS IN GMP-06-02																				
MC	1AUG88A	23SEP88	WMPD APPROVE GMP-06-02																				
LK	26SEP88	30SEP88																					
GMP-06-04: BASELINE CHANGE PROPOSAL REVIEW			PREPARE DRAFT GMP-06-04																				
TS	1AUG88A	28SEP88	WMPD INFORMAL REVIEW OF GMP-06-04																				
LK	29SEP88	5OCT88	RESOLVE & INCORP COMMENTS IN GMP-06-04																				
TS	6OCT88	12OCT88																					

Activity Bar/Early Dates
 Critical Activity
 Progress Bar

WASTE MANAGEMENT PROJECT OFFICE
 NNWSI ADMINISTRATIVE PROCEDURES
 QUALITY MANAGEMENT PROCEDURES (QMP)

Sheet 1 of 2

ADMINISTRATIVE PROCEDURES SCHEDULE

Date	Revision	Checked	Approved

RESP	EARLY START	EARLY FINISH	1988																						
			AUG	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26		
								SEP									NOV						DEC		
LK	13OCT88	19OCT88	OMP-06-04: BASELINE CHANGE PROPOSAL REVIEW																						
			OMP-07-04: SUPPLIER SURVEYS																						
MC	2SEP88	31OCT88	PREPARE DRAFT OMP-07-04																						
LK	1NOV88	7NOV88	OMP INFORMAL REVIEW OF OMP-07-04																						
MC	8NOV88	21NOV88	RESOLVE & INCORP COMMENTS IN OMP-07-04																						
LK	22NOV88	28NOV88	OMP APPROVE OMP-07-04																						
MN	2SEP88	4NOV88	PREPARE REV 3 TO OMP-16-02																						
LK	7NOV88	11NOV88	OMP INFORMAL REVIEW OF OMP-16-02, REV 3																						
MN	14NOV88	25NOV88	RESOLVE & INCORP COMMENTS IN OMP-16-02, REV 3																						
LK	28NOV88	2DEC88	OMP APPROVE OMP-16-02, REV 3																						
JN	1AUG88A	23AUG88A	OMP-16-03: STANDARD DEFICIENCY REPORTING SYSTEM																						
LK	2SEP88	8SEP88	PREPARE REV 1 OF OMP-16-03																						
JN	9SEP88	22SEP88	OMP INFORMAL REVIEW OF OMP-16-03 REV 1																						
LK	23SEP88	29SEP88	RESOLVE & INCORP COMMENTS IN OMP-16-03 REV 1																						
			OMP APPROVE OMP-16-03 REV 1																						
JS	12AUG88A	2SEP88A	OMP-17-01: QA RECORDS																						
LK	2SEP88	8SEP88	PREPARE DRAFT OMP-17-01																						
JS	9SEP88	22SEP88	OMP INFORMAL REVIEW OF OMP-17-02																						
LK	23SEP88	29SEP88	RESOLVE & INCORP COMMENTS IN OMP-17-01																						
			OMP APPROVE OMP-17-01																						

IV

PROJECT PROCEDURES REPORT

SEPTEMBER 1988

- I. MANAGEMENT ASSESSMENT IMPROVEMENT ACTIONS IDENTIFIED REPORT.
- II. ADMINISTRATIVE PROCEDURES (QUALITY RELATED).
- III. QUALITY MANAGEMENT PROCEDURES.
- IV. ADMINISTRATIVE PROCEDURES.
- V. BRANCH TECHNICAL PROCEDURES.

SECTION I

MANAGEMENT ASSESSMENT IMPROVEMENT ACTIONS IDENTIFIED REPORT

MANAGEMENT ASSESSMENT
IMPROVEMENT ACT IDENTIFIED

August-September, 1988

Page 1 of 10

NO.	DESCRIPTION	RESPONSIBILITY	STATUS
7	Revise QMP-03-01 Peer Review (Rev 1)	R. Bahorich/SAIC (Lead) L. Krivanek/WMPO	QA sent to review 1/26; due 2/17. When Bahorich assumed responsibility, took new track; was rewritten. 4/15 draft to T&MSS internal review 5/11, due 5/18. Went into comment resolu- tion 5/19. 4/15 draft to QMP-06-03 Review on 6/15; due 6/21; into resolu- tion as reviews received. Projected completion date: 10/15.
9	Prepare QMP-06-02 Document Control (Rev. 0)	M. Cotter/SAIC (Lead) W. Wilson/WMPO	Appendix A to QMP-06-02 to be final- ized by 5/13. Sent to WMPO for appro- val 5/20. 5/88 returned to T&MSS for additional review. Scheduled to be submitted for approval 9/23.
10	Establish list of individuals needing controlled distribution of NNWSI/88-9 and WMPO/88-1 by memo to J. Rast.	W. Dixon/WMPO L. Skousen/WMPO M. Blanchard/WMPO J. Estella/SAIC	Dixon completed for both by memo to Rast. On 3/1 J. Estella provided up- dates to J. Rast for T&MSS people needing QAPP. Updates were provided 5/5 to Rast for T&MSS personnel need- ing the QAP document. Blanchard com- pleted for both documents by letter WMPO:2287, 6/28. 8/29 Skousen pre- paring revised list; should be done 9/21.
18	Prepare QMP-02-03 WMPO Management Assessment (Rev. 0)	J. Estella/SAIC (Lead) M. Kunich/WMPO	If NNWSI AP-5.8Q is approved and used, this QMP won't be needed and would be deleted. 6/30, AP-5.8Q went into T&MSS internal review comment resolution. 9/88 this has been revisited. Project QAP, Sec- tion 2, para 4.2, requires each par- ticipant to develop internal proced- ures. Primary author and schedule to be assigned to QMP-02-03.

| before a unit of information indicates a change in number, or title, or responsibility for that unit related to previous version. Status carried through issue. Completed items move to back of this section.

MANAGEMENT ASSESSMENT IMPROVEMENT ACTIONS IDENTIFIED

August-September, 1988

Page 2 of 10

NO.	DESCRIPTION	RESPONSIBILITY	STATUS
19	Prepare QMP-02-04 Became AP-5.13Q Readiness Review (Rev 0)	R. Bahorich/SAIC (Lead) J. Robson/WMP0	3/31 draft received Q determination 4/27. 5/5 draft went to T&MSS internal review 5/11; due 5/18; into comment resolution 5/19. Was sent to Project review 8/8; comments due 8/25. Projected completion date: 10/15/88.
23	Prepare QMP-07-02 Effectiveness of Participants QA Programs (Rev 0)	J. Estella/SAIC (Lead) J. Blaylock/WMP0	Draft will be out for review by 12/30. Projected completion date: 2/1/89.
26	Prepare QMP-17-01 Record Source and Record User Responsibilities (Rev 0)	T. Pane/SAIC (Lead) L. Krivanek-J. Blaylock- K. Hatch/WMP0	QMP-17-01 began QMP-06-03 review process on 8/31. Projected completion date: 9/30.
27	Convert SOP-02-02 to AP-5.4Q QALAs for NNWSI Project Activities (Rev 0)	J. Estella-J. Fiore/SAIC (Lead) J. Blaylock/WMP0	Will be submitted to Plans & Procedures Branch for internal review preparation by 9/30. Projected completion date: 11/88.
29	Convert SOP-03-02 to AP-5.5Q Software QA (Rev 0)	K. Schwartztrauber/SAIC (Lead) J. Blaylock/WMP0	Draft sent to Project was completely rewritten: requirements went in new Appendix H for QAP; process is in new AP-5.5Q. Since 8/16, presented Appendix H and AP to QA managers. AP is being informally reviewed by the Project. Projected completion date: 10/31.
30	Convert SOP-03-03 to AP-5.9Q Acceptance of Data and Data Interpretation Not Generated under the NNWSI Project QA Plan (Rev 0)	M. Glora-J. Kepper/SAIC (Lead) J. Blaylock/WMP0	J. Kepper started drafting 12/87. M. Glora reviewed 3/9/88. Preparing for 5/88 review. Sent to T&MSS internal review 5/13, due 5/20. 6/17 into comment resolution. Sent to Project management review 9/2, comments due 9/13. Projected completion date: 10/30.

| before a unit of information indicates a change in number, or title, or responsibility for that unit related to previous version. Status carried through issue. Completed items move to back of this section.

MANAGEMENT ASSESSMENT IMPF ENT ACTIONS IDENTIFIED

August-September, 88

Page 3 of 10

NO.	DESCRIPTION	RESPONSIBILITY	STATUS
38	Convert and revise AP-3.3 to 3.3Q Baseline Change Control (Rev 1)	P. Merkley/SAIC (Lead) W. Wilson/WMP0	Start date: 6/88. Sent to T&MSS internal review 8/31, comments due 9/14. Projected completion date: 11/88.
39	Prepare AP-3.4Q Technical Element of the Project Baseline (Rev 0)	P. Merkley/SAIC (Lead) L. Skousen/WMP0	Started drafting 5/88. Sent to T&MSS internal review 9/13, com- ments due 9/28. Projected completion date: 12/30/88.
41	Prepare AP-5.2Q Technical Information Flow To and From the NNWSI Site and Engineering Properties Data Base (Rev 0)	G. Heitland/SAIC (Lead) D. Livingston/WMP0	Q status confirmed by QA on 5/12. 6/14, being determined whether AP should be deleted. 8/88, determined not to delete. Scheduled for T&MSS internal review 9/30.
42	Prepare AP-5.3Q Information Flow Into the NNWSI Project Reference Information Base (Rev 0)	G. Heitland/SAIC (Lead) J. Robson- D. Livingston/WMP0	Q status confirmed by QA on 5/12. 6/14, being determined whether AP should be deleted. 8/88, determined not to delete. Revised 7/5 draft scheduled for T&MSS internal review 9/30.
43	Prepare AP-5.7Q Site Integration Interface Control	D. Eppler/SAIC (Lead) M. Blanchard/WMP0	5.7Q not required by current version of SEMP. Waiting to see if falls out of SEMP workings; if uncalled for, may request deletion. 5/25, under active discussion.
44	Prepare AP-5.8Q QA Management Assessment (Rev 0)	J. Estella-J. Fiore/SAIC (Lead) M. Kunich/WMP0	QA scheduled transmittal to WMP0 for review and approval 3/88. Went to T&MSS internal review 5/13, due 5/19; into comment resolution 6/30. Scheduled for Project review 10/20. Projected completion date: 11/88.

| before a unit of information indicates a change in number, or title, or responsibility for that unit related to previous version. Status carried through issue. Completed items move to back of this section.

MANAGEMENT ASSESSMENT IMPROVEMENT ACTIONS IDENTIFIED

August-September, '88

Page 4 of 10

NO.	DESCRIPTION	RESPONSIBILITY	STATUS
45	Prepare AP-5.11Q Calibration of Measuring and Test Equipment by NTS Support Contractors (Rev 0)	J. Estella-J. Fiore/SAIC (Lead) J. Blaylock/WMPO	Will be submitted to Plans and Pro- cedures Branch for review prepara- tion by 10/31. Projected completion date: 12/30.
46	Prepare AP-5.15Q Methodology for Q List Development (Rev 0)	R. Zimmerman/SAIC (Lead) J. Blaylock/WMPO	Assigned to Zimmerman; worked with QASC and SNL on informal review. 3/17 draft was prepared. 5/88 pre- paring for a T&MSS internal review. QA doing internal comments prior to internal review. Draft sent to QA 8/15 was determined to be quality related. Sent to T&MSS internal review 9/7, comments due 9/14. Into comment resolution 9/14. Projected completion date: 11/88.

COMPLETED ITEMS

1	Revise QMP-01-01 WMPO Organization (Rev 1)	J. Estella/SAIC (Lead) M. Kunich/WMPO	Sent to WMPO for approval 3/7, NNA.- 880307.0046. WMPO returned with comments from M. Kunich on 3/25, NNA.880330.0024. Resolved, resub- mitted 5/18 for approval. Completed: approved 5/23, Effective Date 5/27.
2	Identify WMPO staff needed to implement responsibility for QMP-01-01 by memo to the WMPO Project Manager	W. Dixon/WMPO M. Blanchard/WMPO L. Skousen/WMPO J. Blaylock/WMPO	Completed: see Item 1.
3	Issue decision paper to consolidate WMPO and T&MSS QAPPs	M. Kunich/WMPO (Lead)	Completed: WMPO:MPK-1809, 5/21/87.

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MANAGEMENT ASSESSMENT IMPF ENT ACTIONS IDENTIFIED

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
COMPLETED ITEMS (continued)			
4	Revise QMP-02-01 Qualification, Proficiency, Indoctrination, and Training of Waste Management Project Office Personnel (Rev. 1)	R. Sweeney/SAIC (Lead) L. Krivanek/WMPO	Went to input review, got together with QA to incorporate comments. Coordinated with the TMP. Was sent to QMP-06-03 review on 7/15; comments due 7/26. Went into comment resolu- tion 7/27. Sent to WMPO for approval on 8/12, NNA.880812.0009. Projected completion date: 9/88.
5	Revise QMP-02-02 The Qualification of QA Program Audit Personnel (Rev 1)	W. Kazor/SAIC (Lead) J. Blaylock/WMPO	Completed: Effective Date 2/22/88.
6	Identify WMPO personnel to be trained/ certified as QA auditors by memo to J. Blaylock	W. Dixon/WMPO M. Blanchard/WMPO L. Skousen/WMPO	Dixon done 2/25, WMPO:1263. Blanchard done 6/3, WMPO:2285. Skousen done 3/16, WMPO:1503.
8	Revise QMP-05-01 Preparation and Control of Quality Management Procedures (Rev 1)	J. Estella/SAIC (Lead) L. Krivanek/WMPO	Completed: 3/27/87 (Rev 0). Rev 1 was sent to WMPO for approval 3/7/88, NNA.880307.0046. Approved by WMPO, 4/1, NNA.880404.0002. Completed: Effective Date 4/11.
11	Revise QMP-06-03 Document Review/Acceptance/Approval (Rev 1)	R. Bahorich/SAIC (Lead) J. Blaylock/WMPO	Approved 2/22; to document control on 3/3 and issued on 3/9. Completed: Effective Date 2/22.
12	Convert and revise QMP-07-01 to QMP-18-02 Surveillances (Rev 1)	W. Kazor/SAIC (Lead) J. Blaylock/WMPO	Completed: 5/11/87 (Rev 0), NNA.- 870518.0012. Rev. 1 was sent to WMPO for approval on 3/7/88, NNA.880307.- 0046. WMPO returned with comments from M. Kunich on 3/25, NNA.880330.- 0024. Resolved, resubmitted 5/18 for approval. Completed: approved 5/23, Effective Date 5/27.

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MANAGEMENT ASSESSMENT IMPROVEMENT ACTIONS IDENTIFIED

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COMPLETED ITEMS (continued)

13	Revise QMP-15-01 Control of Nonconformances (Rev 1)	J. Estella/SAIC (Lead) J. Blaylock/WMPD	Sent to WMPD for approval on 3/7, NNA.880307.0046. WMPD returned with comments from M. Kunich on 3/25, NNA.880330.0024. Resolved, resub- mitted 5/18 for approval. Completed: approved 5/23, Effective Date 5/27.
14	Prepare QMP-16-03 Standard Deficiency Reporting System (Rev 0)	J. Estella/SAIC (Lead) J. Blaylock/WMPD	Completed: 3/27/87, NNA.870803.0008.
15	Revise QMP-16-02 Trend Analysis (Rev 2)	J. Estella/SAIC (Lead) J. Blaylock/WMPD	Completed: 3/27/87 (Rev 1), NNA.- 870929.0083. Rev 2 was sent to WMPD for approval on 3/7/88, NNA.880307.- 0046. WMPD returned with comments from M. Kunich on 3/25, NNA.880330.- 0024. Resolved, resubmitted 5/18 for approval. Completed: approved 5/23, Effective Date 5/27.
16	Revise QMP-18-01 Audit System for the Waste Management Project Office (Rev 2)	W. Kazor/SAIC (Lead) J. Blaylock/WMPD	Completed: 3/27/87 (Rev 1), NNA.870929.0083. Rev. 2 completed: Effective Date 2/22/88.
17	Prepare QMP-01-02 Stop Work (Rev 0)	J. Estella/SAIC (Lead) J. Blaylock/WMPD	Sent to WMPD for approval on 3/7, NNA.880307.0046. WMPD approved on 4/1, NNA.880404.0002. Completed: Effective Date 4/11/88.
20	Prepare QMP-02-05 Commitments to Outside Agencies (Rev. 0)	D. Dawson/SAIC (Lead) J. Blaylock/WMPD	Projected start date: was 4/88. Projected completion date: was 7/88. The QMP will become a nonquality related AP (5.1). Being dropped from list 9/88.

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COMPLETED ITEMS (continued)

- | | | | |
|----|---|--|---|
| 21 | Prepare QMP-02-06
Assessment of Quality Assurance Levels
(Rev 0) | J. Estella/SAIC (Lead)
J. Blaylock/WMP0 | Final scheduled to be submitted to WMP0 for approval by 8/31. Completed: approved 9/7, Effective Date 9/14. |
| 22 | Prepare QMP-04-01
Procurement Document Control (Rev 0)
The QMP should identify the five methods:
1) WMP0 initiate for REEC0 procurement
2) WMP0 initiate for NV procurement
3) WMP0 initiate for SAIC procurement
4) SAIC initiate for SAIC procurement
5) SAIC initiate for REEC0 procurement | J. Estella/SAIC (Lead)
W. Kozai/WMP0 | 1. QMP-04-01 sent to WMP0 for approval on 3/7, NNA.880307.0046. WMP0 approved 4/1, NNA.880404.0002. Completed: Effective Date 4/11.
2. QMP-04-02, Procurement Document Control (Rev 0), draft by 7/88. [J. R. LaRiviere-J. Ryan/SAIC (Lead), W. Kozai/WMP0] 3. QA recommends replacing items 3, 4, 5 with "T&MSS initiate for activities supporting WMP0." Items 3 and 4 are now covered by QMP-04-01. If the need for Item 5 arises in the future, an ICN will be initiated for -04-01. |
| 24 | Prepare QMP-07-03
Control of Purchased Items and Services (Rev 0)
The QMP(s) should identify the five methods:
1) WMP0 initiate for REEC0 procurement
2) WMP0 initiate for NV procurement
3) WMP0 initiate for SAIC procurement
4) SAIC initiate for SAIC procurement
5) SAIC initiate for REEC0 procurement | J. Estella/SAIC (Lead)
W. Kozai/WMP0 | 1. QMP-07-03 sent to WMP0 for approval on 3/7, NNA.880307.0046. WMP0 approved 4/1, NNA.880404.0002. Completed: Effective Date 4/11.
2. Requires also new QMP-07-04 for T&MSS [J. R. LaRiviere-J. Ryan/SAIC (Lead), W. Kozai/WMP0]. Not started drafting. Items 3 and 4 are now covered by QMP-07-03. If the need for Item 5 arises in the future, an ICN will be initiated for QMP-07-03. |
| 25 | Prepare QMP-15-02
Unusual Occurrence Reporting (Rev 0) | J. Estella/SAIC (Lead)
J. Blaylock/WMP0 | Was scheduled to be submitted to WMP0 for approval by 8/15. 7/88 put on hold; UORs may not apply to Project QA program. 9/88 deleted. Per OCRWM, UORS do not apply. |

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COMPLETED ITEMS (continued)

28	Convert SOP-03-01 to AP-5.10Q Use of NTS Contractors on the NNWSI Project (Rev 0)	E. Hardin/SAIC (Lead) M. Kunich/WMPO	Project review was due 3/4. Went into comment resolution 3/7. Hardin/Krivanek meeting 5/13 on final version. Project participant comment resolution verification was sent out 6/29; AP was transmitted for WMPO approval 6/30, NNA.880630.0024. WMPO returned AP for minor fixes 8/4 and 8/22, which were made and AP returned to WMPO 8/16 and 8/25. Completed: 8/88.
31	Convert SOP-03-05 to AP-5.6Q Exploratory Shaft Facility Baseline and Interface Control Procedure (Rev 0)	M. Brake/SAIC (Lead) L. Skousen/WMPO	Project review extended to 3/11 for WMPO and LANL. Went into comment resolution 3/14. Comment verification went out 4/26, due 5/6. Projected completion date: 6/15. 6/13 transmitted to WMPO for approval. Completed: 7/5 sent to Controlled Distribution for issue.
32	Convert SOP-17-01 to AP-1.7Q Records Management (Rev 0)	J. Statler/SAIC (Lead) K. Hatch/WMPO	1. SOP-17-01 being retained to provide instructions for QARMS until system is converted to ARS. 2. AP-1.7Q start date 4/87. Project review is complete (2/88). 5/6 began rewrite incorporating review comments. 7/15 finalized comment resolution verification. 8/8 was sent to WMPO for approval. Was approved 8/10. Completed: 8/15 sent to controlled distribution for issue.
33	Convert and revise AP-1.1 to 1.1Q Administrative Procedure Preparation (Rev 1).	J. Fiore/SAIC (Lead) L. Krivanek/WMPO	Completed: 6/3/87, NNA.870604.0033.

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
COMPLETED ITEMS (continued)			
34	Convert and revise AP-1.3 to 1.3Q Publications Review and Approval (Rev 1)	J. Fiore/SAIC (Lead) L. Krivanek/WMPD	Sent to WMPD for approval 3/14. WMPD approved 4/1, NNA.880404.0002. Completed by issue to Controlled Distribution 4/15, NNA.880415.0028.
35	Prepare AP-1.5Q Issuance and Maintenance of Controlled Documents (Rev 0)	J. Rast/SAIC (Lead) L. Krivanek/WMPD	In project review comment resolution 1/30. WMPD approved 4/1, NNA.-880404.0002. Completed by issue to Controlled Distribution 4/15, NNA.-880415.0028.
36	Prepare AP-1.6Q Release of Unpublished Information (Rev 0)	J. Fiore/SAIC (Lead) W.Kozai/WMPD	In comment resolution. Sent to WMPD for approval 5/27. Projected completion: 6/15. WMPD approved 6/10; Original (signed) received 6/17. Completed: 6/17 issued to Controlled Distribution.
37	Prepare AP-1.8Q Management of State of Nevada Requests for Project Data Items (Rev 0)	J. Fiore/SAIC (Lead) W. Kozai/WMPD	Awaiting receipt of one crucial review from WMPD since 10/87. Have given multiple reminders from 11/87 to now. 9/88 revisited Q-designation; will not be an APQ. Deleted from this report. Will be completed as a nonquality related AP. 9/20 YMP meeting to resolve issues in AP.
40	Prepare AP-3.5Q Regulatory Element of the Project Baseline (Rev 0)	R. Bahorich/SAIC (Lead) M. Blanchard/WMPD	Projected start date: 5/88; completion: 6/88. Determining if AP will be required by SEMP; may request deletion. Deleted: HQ review determined there will be no regulatory element.

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
COMPLETED ITEMS (continued)			
47	Prepare a Training Management Plan (Rev 0)	Y. Willis/SAIC (Lead) L. Krivanek/WMP0	Transmitted to WMP0 1/28/88 for approval (Milestone T906). Sent to project review 2/24, due 3/9. Comment resolution started 3/10 on reviews received. Final was sent to WMP0 for approval 5/13. Projected completion date: 6/88. Approved 7/6.

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SECTION II

ADMINISTRATIVE PROCEDURES (QUALITY RELATED)

ADMINISTRATIVE PROCEDURES (QUALITY RELATED)

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
1.	Revise AP-1.1Q (Rev 1) to Administrative Procedure Preparation, Review, and Approval (Rev 2)	S. Randolph/SAIC (Lead)	Informal improvement review conducted 8/88. Sent to formal T&MSS internal review 9/8, comments due 9/21. Projected completion date: 12/88.
2.	Revise AP-1.3Q Publications Review and Approval (Rev 1)	S. Randolph/SAIC (Lead)	Informal improvement review conducted 7/22, comments due 8/8.
3.	Revise AP-1.5Q Issuance and Maintenance of Controlled Documents (Rev 0)	S. Randolph/SAIC (Lead)	Informal improvement review conducted 8/2, comments due 8/22.
4.	Prepare AP-1.8 Management of State of Nevada Requests for Project Data Items (Rev 0)	J. Fiore/SAIC (Lead)	Awaiting receipt of one crucial review from Project Office since 10/87. Have given multiple reminders from 11/87 to now. 9/88 Revisited Q-designation; will not be an APQ. Deleted from Management Assessment Report. Will be completed as nonquality related AP. 9/20 YMP meeting to resolve issues in the AP.
5.	Prepare AP-1.10Q Preparation, Review, and Approval of SCP Study Plans (Rev 0)	M. Pendleton, SAIC (Lead)	Sent to Project management review on 7/28; comments due 8/4. Into comment resolution 8/3. Projected completion date: 9/30.
6.	Prepare AP-3.5Q Field Change Control Board (Rev 0)	L. Leon, SAIC (Lead)	Draft being prepared to go to T&MSS internal review 9/26. Projected completion date: 12/30.
7.	Prepare AP-3.6Q Physical Configuration Audit (Rev 0)	P. Merkley, SAIC (Lead)	Identified for drafting.
8.	Prepare AP-3.7Q Configuration Identification (Rev 0)	P. Merkley, SAIC (Lead)	Identified for drafting.

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ADMINISTRATIVE PROCEDURES (QUALITY RELATED)

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
9.	Prepare AP-3.XQ Software Management	F. Gowers	Draft scheduled to be sent for T&MSS internal review 9/30; Project review, 10/30. Projected completion date: 12/30.
10.	Prepare AP-5.14Q Design Reviews (Rev 0)	R. Bahorich, SAIC (Lead)	Sent for T&MSS internal review 5/11; comments due 5/18. Into resolution 5/19, internal review remains uncompleted. Sent for Project review 8/8; comments due 8/25. Into comment resolution 8/16. Projected completion date: 10/15/88.
11.	Prepare AP-6.1Q Technical Assessment Reviews for the NNWSI Project Exploratory Shaft Facility (ESF) (Rev 0)	R. Bahorich, <u>W</u> (Lead)	Being replaced by QMP-02-08, Technical Assessment Review.
12.	Prepare AP-6.2Q Field Logging and Documentation of NNWSI Project Borehole Samples (Rev 0)	D. Sinks, SAIC (Lead)	Draft sent to T&MSS internal review 6/15; comments due 6/28. Into comment resolution 7/15. 9/15 Davidson suspending review until U. Clanton informal review provides guidance. Projected completion date: 11/14.
13.	Prepare AP-6.3Q Use of the Sample Management Facility by NNWSI Project Participants (Rev 0)	D. Sinks, SAIC (lead)	Draft sent to T&MSS internal review 6/15; comments due 6/28. Into comment resolution 7/15. 9/15 Davidson suspending review until U. Clanton informal review provides guidance. Projected completion date: 11/14.
14.	Prepare AP-6.4Q Preparation of Pre-Drilling Documentation for NNWSI Project Boreholes (Rev 0)	D. Sinks, SAIC (Lead)	Identified, drafted, and tabled pending action on APs 6.2Q and 6.3Q.

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ADMINISTRATIVE PROCEDURES (QUALITY RELATED)

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
15.	Prepare AP-6.6Q Field Collection, Documentation, and Specimen Removal of Exploratory Shaft and Drift Rock (Rev 0)	B. Carlos/LANL (Lead) D. Davidson/SAIC (Contact)	Draft sent to T&MSS internal review 5/19; comments due 5/27. Into com- ment resolution 7/22. Projected completion date: 11/14.

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SECTION III
QUALITY MANAGEMENT PROCEDURES

QUALITY MANAGEMENT PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
1.	Prepare QMP-02-08 Technical Assessment Review (Rev 0)	R. Bahorich/W (Lead)	Draft sent for T&MSS internal review 5/11; comments due 5/18. Into comment resolution 5/19. Same draft sent for QMP-06-03 review 6/13; comments due 6/21; into comment resolution 6/16. Comments resolution meeting held 7/28. Transmitted for Project Office approval NNA.880803.0006. Completed: Effective Date 8/8.
2.	Prepare QMP-02-09 Qualification of Instructional Staff (Rev 0)	B. Frey/SAIC (Lead)	Draft sent to QMP-06-03 review, comments due 9/23. Projected completion date: 10/24.
3.	Prepare QMP-02-10 Request to Develop Training (Rev 0)	B. Frey/SAIC (Lead)	Draft sent to QMP-06-03 review, comments due 9/23. Projected completion date: 10/24.
4.	Prepare QMP-02-11 Development and Conduct of Training (Rev 0)	B. Frey/SAIC (Lead)	Draft sent to QMP-06-03 review, comments due 9/23. Projected completion date: 10/24.
5.	Prepare QMP-03-02 Scientific Investigation Control (Rev 0)	D. Kettell/SAIC (Lead)	QMP-06-03 review comments resolved. In typing for sign off on verification. Projected completion date: 9/30.
6.	Prepare QMP-03-03 Software Application Cycle (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Will be submitted for internal review after the final AP-5.5Q is transmitted for YMP approval.
7.	Prepare QMP-03-04 Software Development and Maintenance (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Will be submitted for internal review after the final AP-5.5Q is transmitted for YMP approval.

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QUALITY MANA .T PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
8.	Prepare QMP-03-05 Software Verification and Validation (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Will be submitted for internal review after the final AP-5.5Q is transmitted for YMP approval.
9.	Prepare QMP-03-06 Software Configuration Management (Rev 0)	R. Hardwick/SAIC (Lead)	Will be drafted and submitted for internal review after the final AP-5.5Q is transmitted for YMP approval.
10.	Prepare QMP-03-07 Software Configuration Review Group (SWCRG) (Rev 0)	F. Gowers/SAIC (Lead)	Identified to be drafted.
11.	Prepare QMP-04-02 Procurement Document Control (Rev 0)	J. LaRiviere-J. Ryan/ SAIC (Lead)	Identified and drafted by 9/1. Into QMP-06-03 review process 9/14. Projected completion date: 11/88.
12.	Prepare QMP-06-04 Baseline Change Proposal Review (Rev 0)	M. McWilliams/SAIC (Lead)	Draft scheduled to be sent to T&MSS internal review 9/26; Project review, 10/31. Projected completion date: 12/88.
13.	Prepare QMP-06-05 Project Change Control Board (Rev 0)	M. McWilliams/SAIC (Lead)	Draft scheduled to be sent to T&MSS internal review 9/30; Project review, 10/31. Projected completion date: 12/88.
14.	Prepare QMP-06-06 DCRWM Change Control Board Support (Rev 0)	P. Merkley/SAIC (Lead)	Identified for drafting.
15.	Prepare QMP-07-04 Supplier Surveys (Rev 0)	D. Kettell/SAIC (Lead)	Draft being prepared by 11/5 to send to QMP-06-03 review by 12/88; Projected completion date: 1/89.

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SECTION IV
ADMINISTRATIVE PROCEDURES

ADMINISTRATIVE PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
1.	Prepare AP-5.1 Project Commitment Tracking System (PCTS) (Rev 0)	D. Dawson/SAIC (Lead)	AP-5.1Q was sent to T&MSS internal review 2/11; comments due 2/26. Into comment resolution 3/7. Comments could not be resolved as a quality related AP. QMP-02-05, Commitments to Outside Agencies, being written into nonquality related AP (5.1).
2.	Prepare AP-6.5 Cost Estimating for the Nevada Nuclear Waste Storage Investigations (NNWSI) Project Exploratory Shaft Facility (Rev 0)	I. Cottle /SAIC (Lead)	Draft sent to T&MSS internal review 1/88; comments due 1/8. Into com-resolution with M. Brake. Need for this procedure was evaluated. 9/88 determined AP is not needed and will be withdrawn.
3.	Prepare AP-7.1 Conduct and Documentation of NRC Meeting (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
4.	Prepare AP-7.2 Attendance at Technical Meetings with the NRC Conducted by Other Projects (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
5.	Prepare AP-7.3 Scheduling and Preparation for NNWSI Project/NRC Technical Meetings (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
6.	Prepare AP-7.4 Scheduling and Preparation for NNWSI Project/NRC Management Meeting (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
7.	Prepare AP-7.5 Controlling Data Release (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.

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ADMINISTRATIVE PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
8.	Prepare AP-7.6 Communications with the NRC (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
9.	Prepare AP-7.7 NNWSI Project Interactions with the NRC Onsite Representative (OR) (Rev 0)	B. West/SAIC (Lead)	10/15/86 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
10.	Prepare AP-7.8 Report Inventory (Rev 0)	B. West/SAIC (Lead)	6/2/87 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
11.	Prepare AP-7.9 Field and Laboratory Testing Schedule (Rev 0)	B. West/SAIC (Lead)	5/27/87 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
12.	Prepare AP-7.10 Data Catalog	B. West/SAIC (Lead)	6/2/87 draft in review; comment resolution was put on hold pending HQ revision of procedural agreement.
13.	Prepare AP-11.2 Access to NNWSI Project Records by Non-Project Participants (Rev 0)	S. Randolph/SAIC (Lead)	2/12 started preparing. Projected completion date: 3/89.

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SECTION V
BRANCH TECHNICAL PROCEDURES

BRANCH TECHNICAL PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
1.	Prepare BTP-CM-001 CIS Data Base Audits (Rev 0)	P. Merkley/SAIC (Lead)	Identified by CMP to be written.
2.	Prepare BTP-MET-001 Receiving Acceptance Testing, and Performance Auditing of Meteorological Monitoring Equipment (Rev 0)	M. Jablonski/SAIC (Lead)	YMP review completed 8/12. Sent to Project Office for approval 7/26.
3.	Prepare BTP-MET-002 Operation and Calibration Checks of Meteorological Monitoring Equipment (Rev 0)	M. Jablonski/SAIC (Lead)	YMP review completed 8/12. Sent to Project Office for approval 7/26.
4.	Prepare BTP-AQ-001 Ambient Particulate Sampling (Rev 0)	M. Jablonski/SAIC (Lead)	Scheduled for YMP review 9/14. Pro- jected completion date: 9/30.
5.	Prepare BTP-AQ-002 Receiving, Acceptance Testing, and Performance Auditing of Air Quality Monitoring Equipment (Rev 0)	M. Jablonski/SAIC (Lead)	Scheduled for YMP review 9/14. Pro- jected completion date: 9/30.
6.	Prepare BTP-AQ-003 Particulate Sampler Filter Preparation and Handling (Rev 0)	M. Jablonski/SAIC (Lead)	Scheduled for YMP review 9/14. Pro- jected completion date: 9/30.
7.	Prepare BTP-AQ-004 Calibration Checks of Particulate Sampling Equipment (Rev 0)	M. Jablonski/SAIC (Lead)	Scheduled for YMP review 9/14. Pro- jected completion date: 9/30
8.	Prepare BTP-AQ-005 Calculating Particulate Concentrations (Rev 0)	M. Jablonski/SAIC (Lead)	Scheduled for YMP review 9/14. Pro- jected completion date: 9/30.
9.	Prepare BTP-ISD-001 ISD - Personnel Qualification and Training (Rev 0)	R. Crisp/SAIC (Lead)	Into internal review 8/25. Into Project review 9/16; due 9/30. Projected completion date: 10/30.

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BRANCH TECH. PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
10.	Prepare BTP-ISD-002 Transfer of Software (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 4/89.
11.	Prepare BTP-ISD-003 Software Maintenance (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 12/88.
12.	Prepare BTP-ISD-004 Software Engineering (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 2/89.
13.	Prepare BTP-ISD-005 Software Documentation (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 1/89.
14.	Prepare BTP-ISD-006 Software Library (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 5/89.
15.	Prepare BTP-ISD-007 Data Administration (Rev 0)	R. Crisp/SAIC (Lead)	Drafting. Projected completion date: 3/89.
16.	Prepare BTP-LA-001 Evaluation of Participant Request for Site Access (Rev 0)	J. Teak/SAIC (Lead)	Into internal review 8/5. Into Project review 8/19, due 9/2. Projected completion date: 10/88.
17.	Prepare BTP-PB-001 Verification of Education and Experience (Rev 0)	J. Hedden/SAIC (Lead)	Scheduled to go to internal review 10/28, project review 11/11. Projected completion date: 12/11.
18.	Prepare BTP-TB-001 Instructional Evaluation (Rev 0)	B. Frey/SAIC (Lead)	Identified to be written.
19.	Prepare BTP-RMD-001 SAIC/T&MSS Local Records Center (Rev 0)	T. Pane/SAIC (Lead)	Into internal review 8/1. Into Project review 8/19, due 9/2. Projected completion date: 10/11.
20.	Prepare BTP-RMD-002 NNWSI Project Central Records Facility Operations (Rev 0)	T. Pane/SAIC (Lead)	Into internal review 8/1. Into Project review 8/19, due 9/2. Projected completion date: 10/11.

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BRANCH TECHN. PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
21.	Prepare BTP-YMP-003 WMPD Mail and Records Facility Operations (Rev 0)	T. Pane/SAIC (Lead)	Into internal review 9/2. Into Project review 9/8, due 9/14. Projected completion date: 10/11.
22.	Prepare BTP-ER-001 Preparation and Control of Environmental Radiological Monitoring Procedures (Rev 2)	S. Woolfolk/SAIC (Lead)	Issued 2/2/88.
23.	Revise BTP-ER-002 Receipt, Operations, Exchange, Termination, and Shipment of Integrating Radon Samplers (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
24.	Prepare BTP-ER-003 Receipt Inspection and Acceptance Testing of Continuous Radon Monitor (Rev 0)	S. Woolfolk/SAIC (Lead)	Projected completion date: 10/1.
25.	Prepare BTP-ER-004 Installation of Continuous Radon Monitor (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
26.	Prepare BTP-ER-005 Operation, Accuracy Verification, and Calibration of Continuous Radon Monitor (Rev 1)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
27.	Revise BTP-ER-006 Receipt Inspection and Acceptance Testing of Continuous Air Samplers (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
28.	Revise BTP-ER-007 Operation and Accuracy Verification of Continuous Air Samplers (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
29.	Prepare BTP-ER-008 Data Analysis Reports Documentation (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.

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BRANCH TECHNICAL PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
30.	Prepare BTP-ER-010 Preparation of Quality Control Integrating Radon Samples (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
31.	Prepare BTP-ER-011 Radiation Safety, Radiation Contamination, and Radioactive Material Control (Rev 0)	S. Woolfolk/SAIC (Lead)	Transmitted to Project Office for approval 8/24.
32.	Revise BTP-ER-012 Installation of Integrating Radon Samplers (Rev 0)	S. Woolfolk/SAIC (Lead)	Draft revision in progress.
33.	Revise BTP-ER-013 Alpha Survey Instrument (Rev 0)	S. Woolfolk/SAIC (Lead)	Draft revision in progress.
34.	Prepare BTP-ER-014 Beta/Gamma Survey Instrument (Rev 0)	S. Woolfolk/SAIC (Lead)	Draft revision in progress.
35.	Revise BTP-ER-015 Environmental Monitoring Radiological Documentation Control and Distribution, General Maintenance, and Calibration Services (Rev 0)	S. Woolfolk/SAIC (Lead)	Rev. 1 issued 6/10/87.
36.	Revise BTP-ER-016 Electrical Safety Inspection of 110 Volt AC Powered Equipment (Rev 0)	S. Woolfolk/SAIC (Lead)	Draft revision in progress.
37.	Prepare BTP-ER-017 Environmental Monitoring Radiological Plans/Reports Analyses Computer Program Usage, and Readiness Reviews (Rev 0)	S. Woolfolk/SAIC (Lead)	Rev. 0 issued 6/10/87.
38.	Revise BTP-ER-018 Receipt Inspection for Radiological Monitoring Program Materials and Equipment (Rev 0)	S. Woolfolk/SAIC (Lead)	Draft revision in progress.

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BRANCH TECHNICAL PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
39.	Prepare BTP-ER-19 Handling and Shipping of Radioactive Materials (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
40.	Prepare BTP-ER-020 General Acceptance Testing Procedure for Radiological Monitoring Equipment (Rev 0)	S. Woolfolk/SAIC (Lead)	Rev. 0 issued 6/10/87.
41.	Prepare BTP-ER-022 Operation and Calibration of Constant (K-Flow) Low-Volume Particulate Sampling Systems (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
42.	Prepare BTP-ER-023 Operation and Calibration of Analytical Balances (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
43.	Prepare BTP-ER-024 Calibration of Thermometer(s) (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
44.	Prepare BTP-ER-026 Calibration, Inspection, and Operation of Cascade Impactors (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
45.	Prepare BTP-ER-027 Operation and Calibration of Barometer(s) (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
46.	Prepare BTP-ER-028 Nuclear Data Equipment Calibration (Energy and Efficiency) (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
47.	Prepare BTP-ER-029 Nuclear Data In Situ Calibration (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.

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BRANCH TECHNICAL PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
48.	Prepare BTP-ER-030 Preparation and Control of Blanks and Spikes (Quality Control) Samples (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
49.	Prepare BTP-ER-031 Siting, Installation, and Termination of Environmental Radiological Monitoring Stations (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
50.	Prepare BTP-ER-033 Water Sampling Archive Study (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
51.	Prepare BTP-ER-034 Response to Projected Abnormal Events (Rev 0)	S. Woolfolk/SAIC (Lead)	Drafting in progress.
52.	Prepare BTP-SMF-001 Management and Operation of the SMF (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24/88. Projected completion date: 12/2.
53.	Prepare BTP-SMF-002 Transport, Receipt, and Admittance for Curation of Yucca Mountain Project (YMP) Borehole Samples (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.
54.	Prepare BTP-SMF-003 Verification of Field Logging and Documentation of YMP Borehole Samples (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.
55.	Prepare BTP-SMF-004 Physical Processing and Storage of YMP Samples and Specimens (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.
56.	Prepare BTP-SMF-005 Examination of YMP Samples by Participants (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.

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BRANCH TECHNICAL PROCEDURES

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NO.	DESCRIPTION	RESPONSIBILITY	STATUS
57.	Prepare BTP-SMF-006 Removal of Whole Core Samples and Specimens for Shipment and Remnant Return (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.
58.	Prepare BTP-SMF-007 Acceptance for Curation of YMP Samples and Records Exclusive of Core and Cuttings (Rev 0)	D. Sinks/SAIC (Lead)	Into internal review 7/11. Scheduled to go to Project review 10/24. Pro- jected completion date: 12/2.
59.	Prepare BTP-SE-001 Socioeconomic Monitoring and Mitigation Plan (SMMP) Monitoring Implementation Procedure (Rev 0)	B. Facendini/SAIC (Lead)	Into internal review 8/5. Scheduled to go to Project review 9/12. Pro- jected completion date: 10/12.
60.	Prepare BTP-SE-002 Expenditure Tracking Program Branch Technical Procedure (Rev 0)	C. Rogers/SAIC (Lead)	Scheduled to go to internal review 9/29. Projected completion date: 10/29.
61.	Prepare BTP-SE-003 Secondary Data Source Documentation Maintenance (Rev 0)	G. Snyder/SAIC (Lead)	Into internal review 8/24. Scheduled to go to Project review 9/23. Pro- jected completion date: 11/7.
62.	Prepare BTP-TRN-001 Transportation Data Acquisition, Analysis, Review, and Reporting (Rev 0)	J. Teak/SAIC (Lead)	Into internal review 8/22. Scheduled to go to Project review 9/16. Pro- jected completion date: 10/16.

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V

IMPLEMENTATION PLANS RELATED TO QUALITY ASSURANCE PROGRAM CRITERIA

QAP CRITERIA/SECTION

1. PROJECT MANAGEMENT PLAN (PMP)

- AP-1.1Q Administrative Procedure Preparation.....V-1.0
- AP-1.2 Conduct and Minutes of TPO Meeting
- AP-1.3Q Publications Review and Approval.....II-3.2, III-1.8.1
- AP-1.4Q Distribution of Information Products
- AP-1.9 Waste Management Project Office (WMPO)
Action Item Tracking System
- AP-2.1 Weekly Informal Report
- AP-2.4 NNWSI Project Quarterly Technical Report
- AP-2.5 NNWSI Project Monthly Report
- AP-2.6 NNWSI Project Bibliography
- AP-2.7 Monthly Forecast Calendar
- AP-2.8 Monthly Technical Data Transfer Report
- AP-5.1Q Project Commitment Tracking System (PCTS) Procedure
- AP-11.1 Electronic Transfer of Correspondence Files
- AP-7.1 THROUGH 7.10 (See NRC Interaction Procedures)

2. SYSTEMS ENGINEERING MANAGEMENT PLAN (SEMP)

- AP-3.3Q Baseline Change Control
- AP-3.6Q Product Configuration Audits
- AP 5.2Q Technical Information Flow to and from the NNWSI
Site and Engineering Properties Data Base.....VIII-C1.1
- AP-5.3Q Information Flow into the NNWSI Project
Reference Information Base
- AP-5.4Q QALAs for NNWSI Project Activities.....II-2.1.1, II-2.2.2,
III-1.2.2, III-2.1.2
- AP-5.6Q Exploratory Shaft Facility Technical Elements
Baseline and Interface Control Procedure.....III-1.8.1
- AP-5.7Q Site Integration Interface Control.....III-1.8.1
- AP-5.9Q Acceptance of Data and Data Interpretation Not
Generated Under the NNWSI Project QA Plan.....II-1.4, II-2.2.3.2
- AP-5.10Q Use of NTS Contractors on the NNWSI Project.....III-1.8.1
- AP-5.13Q Readiness Reviews.....III-5.0
- AP-5.14Q Design Reviews.....III-1.8.1, III-2.1.1
III-2.4.6.1, III-2.6.1
III-5.0
- AP-5.15Q Methodology for Q-List Development II-1.5.2

*Some Procedure Titles
Differ Slightly from the
TABLE OF CONTENTS BECAUSE
REVISIONS ARE IN PROCESS.
THE TOC WILL CHANGE UPON ISSUE*

QAP CRITERIA/SECTION

3. CONFIGURATION MANAGEMENT PLAN (CMP)

AP-1.5Q	Issuance and Maintenance of Controlled Documents.....	III-1.8.1, VI-1.0 III-2.2.2, III-2.6.1
AP-3.1Q	Project Management Baseline	
AP-3.3Q	Baseline Change Control	
AP-3.4Q	Project Technical Baseline	
AP-3.5Q	Field Change Control Board	
AP-3.6Q	Physical Configuration Audits	
AP-3.7Q	Configuration Identification	

4. QUALITY ASSURANCE PLAN (QAP)

AP-5.4Q	QALAs for NNWSI Project Activities.....	II-2.2.1, III-1.2.2 III-2.1.2
AP-5.5Q	Software Quality Assurance.....	III-2.4.6.1, III-3.1 III-5.0
AP-5.8Q	QA Management Assessment.....	II-2.1.1
AP-5.9Q	Acceptance of Data and Data Interpretation Not Generated Under the NNWSI Project QA Plan.....	II-2.2.3.2

(PLUS ALL APQs)

5. RECORDS MANAGEMENT PLAN (RMP)

AP-1.6Q	Release of Unpublished Information	
AP-1.7Q	Records Management.....	III-2.8, XVII
AP-1.8Q	Management of State of Nevada Request for Project Data Items	
AP-11.2	Access to NNWSI Project Records by Non-Project Participants	

6. TEST & EVALUATION PLAN (T&EP)

AP-1.10Q	Preparation, Review, and Approval of SCP Study Plans.....	III-1.1.1, III-1.2.2 III-1.3.1, III-1.3.2 III-1.8.1
AP-6.2Q	Fieldlogging and Documentation of NNWSI Project Borehole Samples.....	VIII-A1.1, VIII-A2.0 VIII-B1.1, XIII-1.0 XIII-1.1, XIII-1.2
AP-6.3Q	Use of the Sample Management Facility by NNWSI Project Participants.....	XIII-1.0, XIII-1.1 XIII-1.2
AP-6.4Q	Preparation of Pre-Drilling Documentation for NNWSI Project Boreholes	

	<u>QAP CRITERIA/SECTION</u>
7. <u>EXPLORATORY SHAFT CONSTRUCTION MANAGEMENT PLAN (ESCMP)</u>	
AP-5.5Q Software Quality Assurance.....	III-2.4.6.1, III-3.1
AP-5.10Q Use of NTS Contractors on the NNWSI Project.....	III-5.0 III-1.8.1
AP-5.11Q Calibration of Measuring and Test Equipment by NTS Support Contractors.....	XII-2.6
AP-5.12Q T&MSS Technical Support Representatives for the NNWSI Project Exploratory Shaft Facility	
AP-6.1Q Technical Assessment Reviews for the NNWSI Project Exploratory Shaft Facility (ESF).....	III-1.8.1
8. <u>TRAINING MANAGEMENT PLAN (TMP)</u>	II-5.0, III-2.1.3 II-5.1.3
TBD	
9. <u>PERFORMANCE MEASUREMENT APPLICATIONS PLAN (FAPMAP)</u>	
AP-2.3 Major System Acquisitions Report	
AP-3.2 Monthly Reporting and Analysis	
10. <u>ENVIRONMENTAL SAFETY & HEALTH PROTECTION IMPLEMENTATION PLAN (ESHPIP)</u>	
TBD	

9/21/88

U.S. DEPARTMENT OF ENERGY

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YUCCA MOUNTAIN PROJECT

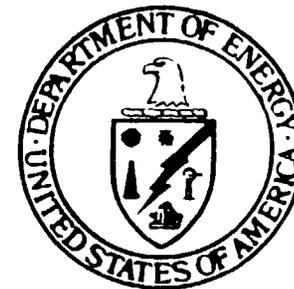
TPO PRESENTATION

PRESENTED BY

CARL GERTZ
PROJECT MANAGER

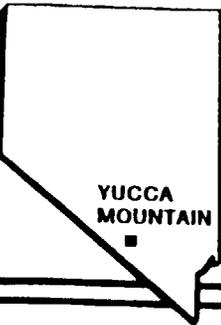
SEPTEMBER 22, 1988

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE



U.S. DEPARTMENT OF ENERGY

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YUCCA MOUNTAIN PROJECT

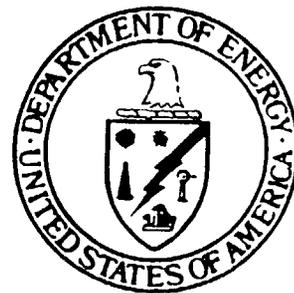
TPO PRESENTATION

PRESENTED BY

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PROJECT MANAGER

SEPTEMBER 22, 1988

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE



AGENDA

ORGANIZATION

EDISON ELECTRIC INSTITUTE BRIEFING

OFFICE OF MANAGEMENT & BUDGET BRIEFING

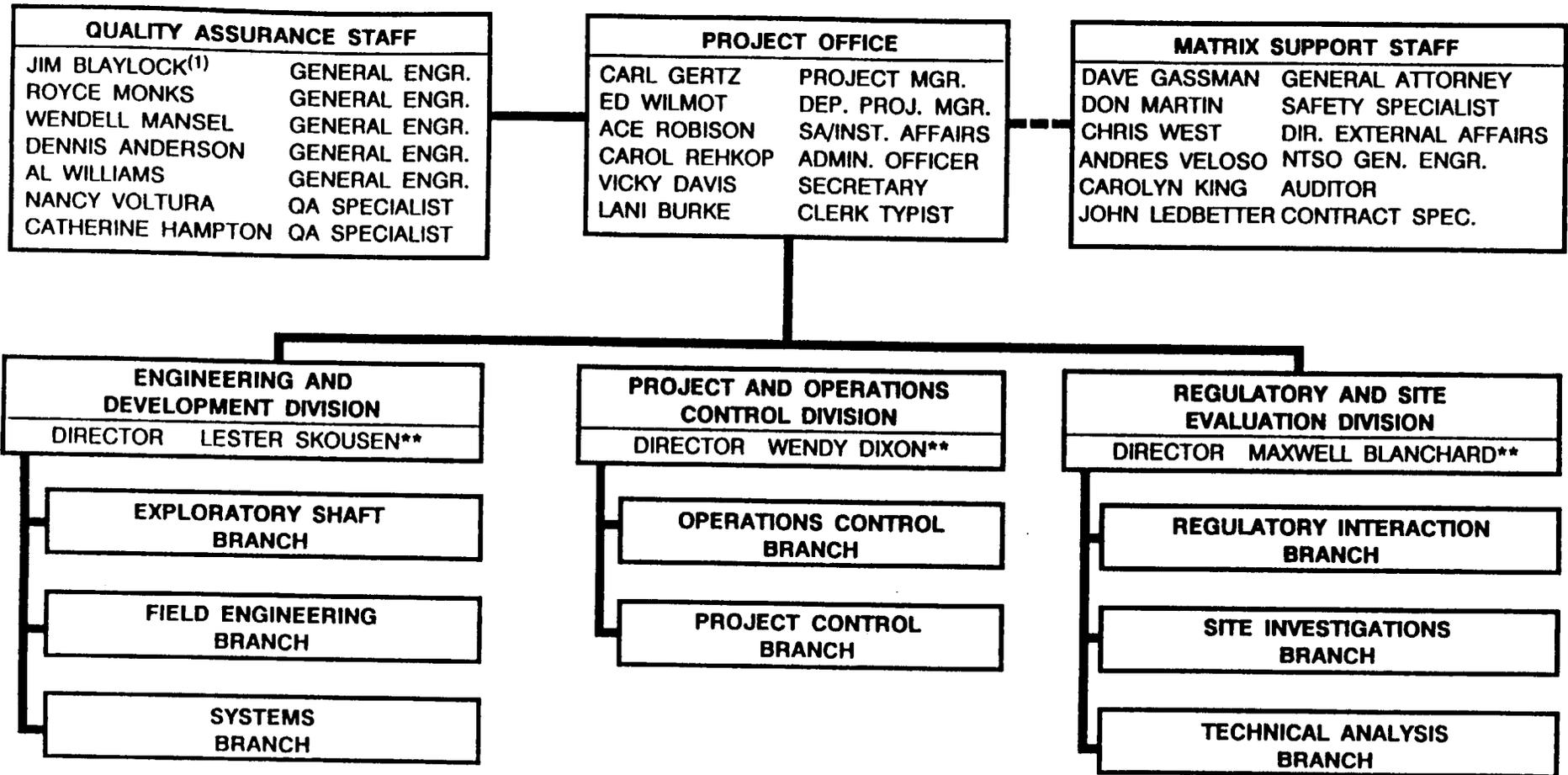
RECENT LEGISLATION

EXPLORATORY SHAFT FACILITY

- HEADQUARTERS PRESENTATION**
- ESF START**

OUTREACH ACTIVITIES

YUCCA MOUNTAIN PROJECT ORGANIZATION



(1) REPORTS TO MANAGER FOR QA/QC INTERACTIONS

(2) EOD 8/28/88

** ACTING

— DIRECT REPORTING
- - - MATRIX REPORTING

EEI's UTILITY NUCLEAR WASTE MANAGEMENT GROUP (UNWMG) ATTENDED A PROJECT BRIEFING ON AUGUST 23-24

- **AUDIENCE INCLUDED EIGHT UNWMG MEMBERS, OCRWM AND NRC STAFF, AND PROJECT PARTICIPANTS**
- **TOPICS COVERED WERE THE PROJECT STATUS, SCP, LICENSING AND TECHNICAL ISSUES, AND PROJECT INTERFACES**

DURING THE BRIEFING, EEI IDENTIFIED AREAS OF CONCERN

- **THE IMPACTS OF ANY SCHEDULE DELAYS
ON THE WASTE ACCEPTANCE SCHEDULE**
- **THE POTENTIAL FOR FURTHER DELAYS AS
A RESULT OF BUDGET CONSTRAINTS,
OVERABUNDANCE OF PAPERWORK, STATE
AND LOCAL PROBLEMS**

EEI MEMBERS SAID THEY WERE PLEASED WITH THE NEW LOOK AND OPTIMISM AT THE PROJECT

- **CONSIDERED MEETINGS VERY PRODUCTIVE
AND COMPLIMENTED THE PRESENTERS**
- **CONSIDERED NRC REPRESENTATION AT
THE MEETING AS POSITIVE**
- **APPRECIATED THE CLEAR AND THOROUGH
DISCUSSIONS OF THE WASTE PACKAGE**

RECENT LEGISLATIVE ACTIVITIES

● NUCLEAR INSURANCE

- PRICE-ANDERSON RENEWAL LEGISLATION SIGNED BY PRESIDENT ON AUGUST 20**
- PROVIDES INDEMNITY FOR NUCLEAR ACCIDENTS (INCLUDING WASTE) OF UP TO \$7.2 BILLION. COVERAGE EXTENDED FOR 15 YEARS**

● NRC REORGANIZATION/SINGLE ADMINISTRATOR

- SENATE PASSED NRC AUTHORIZATION BILL AUGUST 8 CONTAINING REORGANIZATION PROVISIONS**
- HOUSE HAS NOT AGREED TO REORGANIZATION PROVISIONS**
- BILL IS NOT EXPECTED TO PROGRESS ANY FURTHER**

RECENT LEGISLATIVE ACTIVITIES

(CONTINUED)

- **NEW NRC COMMISSIONER NOMINATED - JAMES CURTISS**
 - **SERVED AS MINORITY COUNSEL FOR SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS**
 - **EXPECTED TO SHOW BIG INTEREST IN HLW PROGRAM (PARTICIPATED IN DRAFTING NWPA)**
 - **CONFIRMATION HEARING HELD BY ABOVE COMMITTEE ON SEPTEMBER 13**
 - **NEXT STEP IS FULL SENATE CONFIRMATION, BUT SOME SENATORS ARE TRYING TO PUT A HOLD ON CONFIRMATION UNTIL AFTER ELECTION**

RECENT LEGISLATIVE ACTIVITIES

(CONTINUED)

● WIPP LAND WITHDRAWAL

- HOUSE AND SENATE SUBCOMMITTEES ARE CURRENTLY CONSIDERING LEGISLATIVE LAND WITHDRAWAL OF LANDS FOR WIPP**
- TIED TO LAND WITHDRAWAL ARE PROVISIONS REQUIRING WIPP COMPLIANCE WITH EPA STANDARDS PRIOR TO RECEIPT OF WASTE**
- BECAUSE OF AMOUNT OF CONTROVERSY, BILL MAY NOT PROGRESS THIS SESSION**

OUTREACH ACTIVITIES

RECENT PUBLIC INTERACTIONS

- PAHRUMP TOWN BOARD MEETING
- LINCOLN COUNTY TOWN HALL MEETING
- SOUTHERN NEVADA CHAPTER OF THE RETIRED OFFICERS ASSOCIATION MEETING
- WEST CHARLESTON LIONS CLUB MEETING
- UNLV ENVIRONMENTAL RESEARCH CENTER SEMINAR (3)
- TOUR OF INEL FOR THE NEVADA LEGISLATIVE COMMITTEE ON HIGH-LEVEL RADIOACTIVE WASTE

SCHEDULED INTERACTIONS

- STATE OF THE PROJECT, SEPTEMBER 22, 1988
- LAS VEGAS CITY OFFICIALS, SEPTEMBER 23, 1988
- NEVADA SOCIETY OF RADIOLOGIC TECHNOLOGISTS, SEPTEMBER 24, 1988

**PROTOTYPE TESTING
STATUS REPORT**

- **OBJECTIVES OF PROTOTYPE TESTING**
- **FY 88 KEY ACCOMPLISHMENTS**
- **PROBLEM AREAS DEFINED**
- **TEST BY TEST OBJECTIVES AND ACCOMPLISHMENTS
- FY 88**
- **FY 89 PLANNED ACTIVITIES**
- **SUMMARY**

**HEMI N. KALIA
SEPTEMBER 22, 1988**

OBJECTIVES OF PROTOTYPE TESTING

THE OBJECTIVES OF THE PROTOTYPE TESTING ARE TO:

- DEVELOP AND OR VALIDATE TESTING METHODS LIKELY TO BE USED FOR THE CHARACTERIZATION TESTING IN THE ESF.
- INSURE THAT THE TEST METHODOLOGIES FOR THE ESF TESTING WILL BE ESTABLISHED PRIOR TO PERFORMING TESTS IN THE ESF.
- DEVELOP IMPLEMENTATION (QA) PROCEDURES.
- REDUCE THE LEVEL OF UNCERTAINTY FOR THE SITE CHARACTERIZATION TESTING IN THE ESF.
- DEVELOP PROCEDURES FOR DATA MANAGEMENT.
- PERSONNEL CAN BE TRAINED TO CONDUCT ESF TESTS AND AVOID FALSE STARTS.

SUMMARY OF PROPOSED PROTOTYPE TESTS
(WITH RESPONSIBLE ORGANIZATION AND PIS)

PROTOTYPE TESTS

<u>ABBREVIATED TEST NAME</u>	<u>PRINCIPAL/AND CO-INVESTIGATOR</u>	<u>FUNDED FY 88</u>
1. UNDERGROUND GEOLOGIC MAPPING	MARK MC KEOWN/USBR STEVE BEASON/USBR	Y
2. MINERALOGY/PETROLOGY	FRANK BYERS, LANL BARBARA CARLOS/LANL SCHON LEVY, LANL	Y
3. WET AND DRY DRILLING	ALAN FLINT/USGS MIKE CHORNACK/G&A	Y
4. DRILL HOLE INSTRUMENTATION	JOE ROUSSEAU/USGS MARK PABST/USBR	Y
5. BLAST EFFECTS	JOSEPH PRIZIO/USBR JOE KOTTENSTETTE/USGS LES SHEPHARD/SNL	
6. CROSS HOLE	ROBERT TRAUTZ/USGS ROBERT CRAIG/USGS	Y
7. TRACER	ALBERT YANG/USGS DONALD LANGMUIR	Y
8. EXCAVATION EFFECTS	JAMES BOERNGE/USBR	
9. OPTIMAL RUBBLE SIZE	CHARLES PETERS/USGS ALBERT YANG/USGS	

(Y = FUNDED IN FY 88)

PROTOTYPE TESTS

<u>ABBREVIATED TEST NAME</u>	<u>PRINCIPAL/AND CO-INVESTIGATOR</u>	<u>FUNDED FY 88</u>
10. INTACT FRACTURE	GARY SEVERSON/G&A	Y
11. INFILTRATION	ED KWICKLIS/USGS	Y
12. BULK PERMEABILITY	SANDI DOTY/SAIC	
13. LAB FRACTURE ANALYSIS	FALAH THAMIR/G&A	Y
14. PERCHED WATER	BARNEY LEWIS/USGS	
15. RUBBLE CORING	CHARLES PETERS/USGS ALBERT YANG/USGS	
16. PORE WATER EXTRACTION	ALBERT YANG/USGS CHARLES PETERS/USGS	Y
17. CONTROLLED BLASTING	JOE KOTTENSTETTE/USBR	
18. THERMAL STRESS	BARBARA LUKE/SNL	Y
19. IN SITU STRESS	FITZHUGH LEE/USGS RAY FINLEY/SNL	
20. DIFFUSION	A. EDWARD NORRIS/LANL	Y
21. ENGINEERED BARRIER DESIGN	DALE WILDER/LLNL ABELARDO RAMIREZ/LLNL	Y
22. AIR CORING	M. JAMES RAY/LANL	Y
23. AIR CORING/DUST HAZARDS	BARBARA SKAGGS, LANL	Y

(Y = FUNDED IN FY 88)

FY 88 KEY ACCOMPLISHMENTS

15 OF 23 PROTOTYPE TESTS WERE APPROVED BY PROJECT
WORK WAS STARTED ON ALL OF THE APPROVED TESTS IN
FIELD & LAB

AIR CORING WAS SUCCESSFULLY PERFORMED-CORE
RECOVERY WAS 97%

LEXAN TUBE WAS SUCCESSFULLY USED TO SEAL CORE IN
THE BARREL

DUST CONTROL SYSTEM FOR DRY DRILLING WAS FOUND TO
BE QUITE EFFECTIVE

DRILL BIT LIFE WAS MORE THAN PROJECTED

ALL FY 88 APPROVED TESTS WERE COMPILED BY LOS
ALAMOS IN THE PROTOTYPE TEST PLAN VOLUME I
DOCUMENT

ALL FY 89 (TO BE) APPROVED TESTS ARE BEING
COMPILED AS VOLUME II

PROBLEM AREAS

- ° FRAN RIDGE PIT DEEPENING WAS DELAYED IMPACTING PROCUREMENT OF SAMPLES AND TESTING OF MAPPING EQUIPMENT
- ° FUNDS TO DEEPEN THE FRAN RIDGE PIT ARE NOT AVAILABLE ALTHOUGH THE PERMISSION TO DEEPEN PIT HAS BEEN RECEIVED.
- ° PROTOTYPE TESTING START WAS DELAYED TO SECOND QUARTER OF FY 88. THIS HAS DELAYED COMPLETING TESTS.
- ° EMPLACEMENT MODE DECISION MIGHT IMPACT THE ENGINEERED BARRIER TEST. TEST IN PROGRESS IS FOR HORIZONTAL EMPLACEMENT MODE. VERTICAL EMPLACEMENT MODE TESTING MAY HAVE TO BE ACCELERATED.

PROTOTYPE TESTS FUNDED IN FY 88

1. UNDERGROUND GEOLOGIC MAPPING
2. TEST OF SAMPLE COLLECTION PROCEDURES FOR THE
EXPLORATORY SHAFT (MIN/PET)
3. EVALUATION OF THE EFFECTS OF WET AND DRY DRILLING FLUIDS
ON THE IN SITU HYDROLOGIC CONDITIONS OF TUFFACEOUS ROCKS
IN SUPPORT OF EXPLORATORY SHAFT HYDROLOGIC TESTING
4. DRILL HOLE INSTRUMENTATION IN SUPPORT OF EXPLORATORY
SHAFT HYDROLOGIC TESTING
5. CROSS-HOLE PNEUMATIC AND HYDRAULIC TESTING IN SUPPORT OF
EXPLORATORY SHAFT HYDROLOGIC TESTING
6. TRACER TESTING (GAS AND WATER) IN EXPLORATORY
SHAFT TESTS
7. INTACT FRACTURE
8. INFILTRATION
9. PORE-WATER EXTRACTION BY TRIAXIAL COMPRESSION TEST
10. LAB FRACTURE ANALYSIS
11. THERMAL STRESS TEST
12. DIFFUSION TEST
13. ENGINEERED BARRIER DESIGN TEST
14. AIR CORING TEST
15. EXPERIMENTAL PROCEDURE: EVALUATION OF POTENTIAL
DUST-RELATED HEALTH HAZARDS ASSOCIATED WITH DRILLING

GEOLOGIC MAPPING

ACCOMPLISHMENTS:

- TESTS WERE CONDUCTED IN G-TUNNEL AND AT FRAN RIDGE
- TWO TYPES OF CAMERAS WERE COMPARED
- MOUNTING HARDWARE WAS FIELD TESTED
 - DRIFT - RAIL MOUNT
 - SHAFT - PLATFORM MOUNT
- LASER GONIOMETER AND DEFLECTORS TESTED
- DRAFT ESF MAPPING PROCEDURE IN PREPARATION
- COMPUTERIZED MAPPING SOFTWARE AND HARDWARE
- PROGRESSING USING G-TUNNEL & FRAN RIDGE PHOTOS
- APPROVAL TO DEEPEN FRAN RIDGE TEST PIT(S)
RECEIVED (9/88)

MINERALOGY/PETROLOGY

ACCOMPLISHMENTS:

- ° WORK IS ON SCHEDULE TO HAVE SAMPLING PROCEDURE IN PLACE BY MARCH 1989.

- ° SECONDARY TASKS DELAYED DUE TO THE DIFFICULTY IN ACCESSING FRAN RIDGE (AIR QUALITY PERMIT).

WET AND DRY DRILLING

ACCOMPLISHMENTS:

- ° COMPARED G-TUNNEL & TOPOPAH SPRING
HYDROLOGIC PROPERTIES - RESULTS SHOW
STRONG SIMILARITIES

- ° DETERMINED THAT BOREHOLE TEMPERATURES DO
NOT RISE APPRECIABLY WHEN DRY DRILLING

- ° PERFORMED GEOSTATISTICAL ANALYSES ON
VERTICAL VERSUS HORIZONTAL MOISTURE
VARIABILITY
HORIZONTAL IS 1/3 OF VERTICAL
(THIS RESULT MAY LIMIT CONFIDENCE WHEN
EXTRAPOLATING FROM VERTICAL BOREHOLES
TO SURROUNDING ROCK)

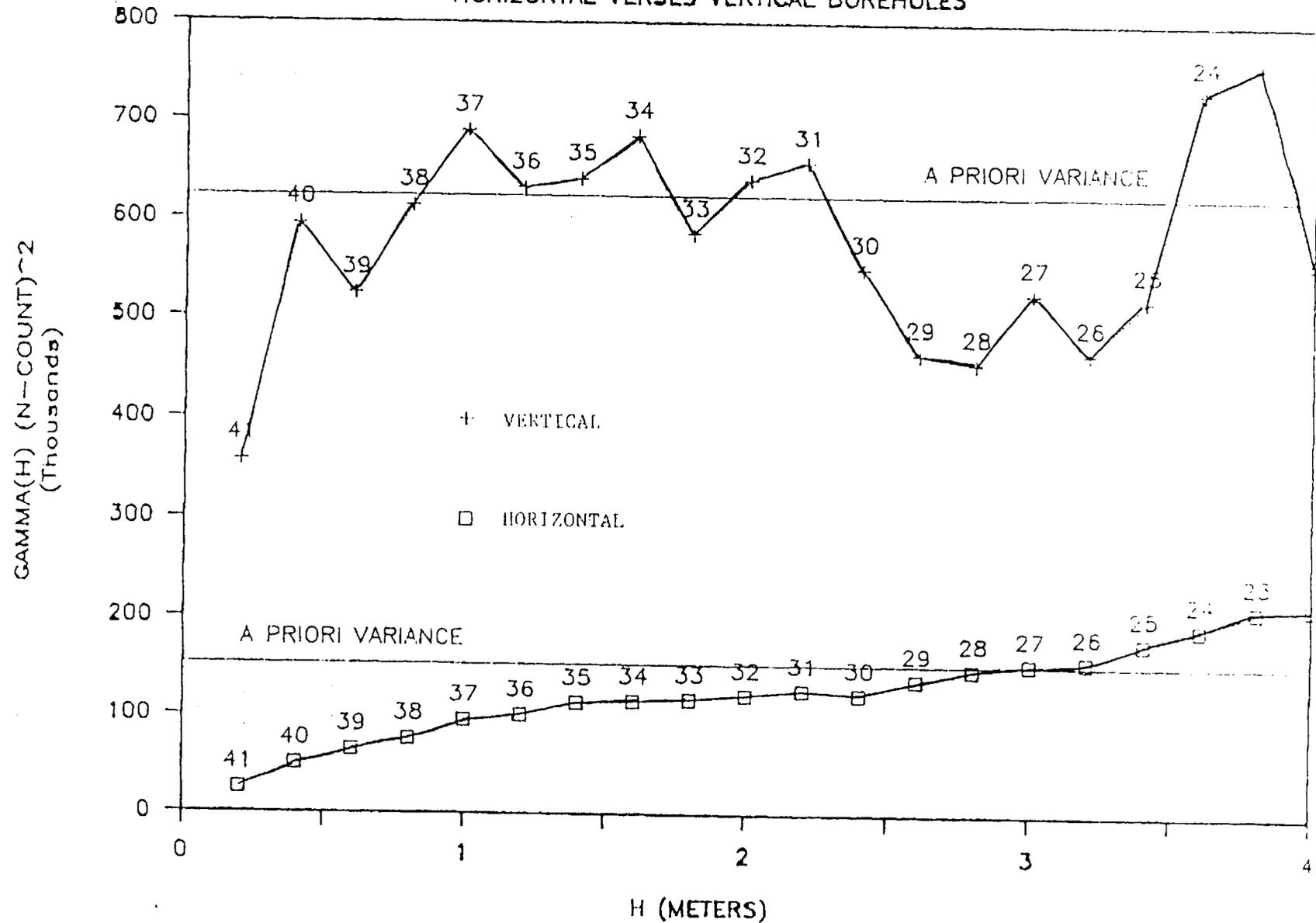
- ° PROCURED TEST INSTRUMENTS

- ° REVISE/UPDATE PLANS AND SUPPORT CRITERIA

- ° FIELD WORK EXPECTED TO START IN G-TUNNEL IN
FY 89

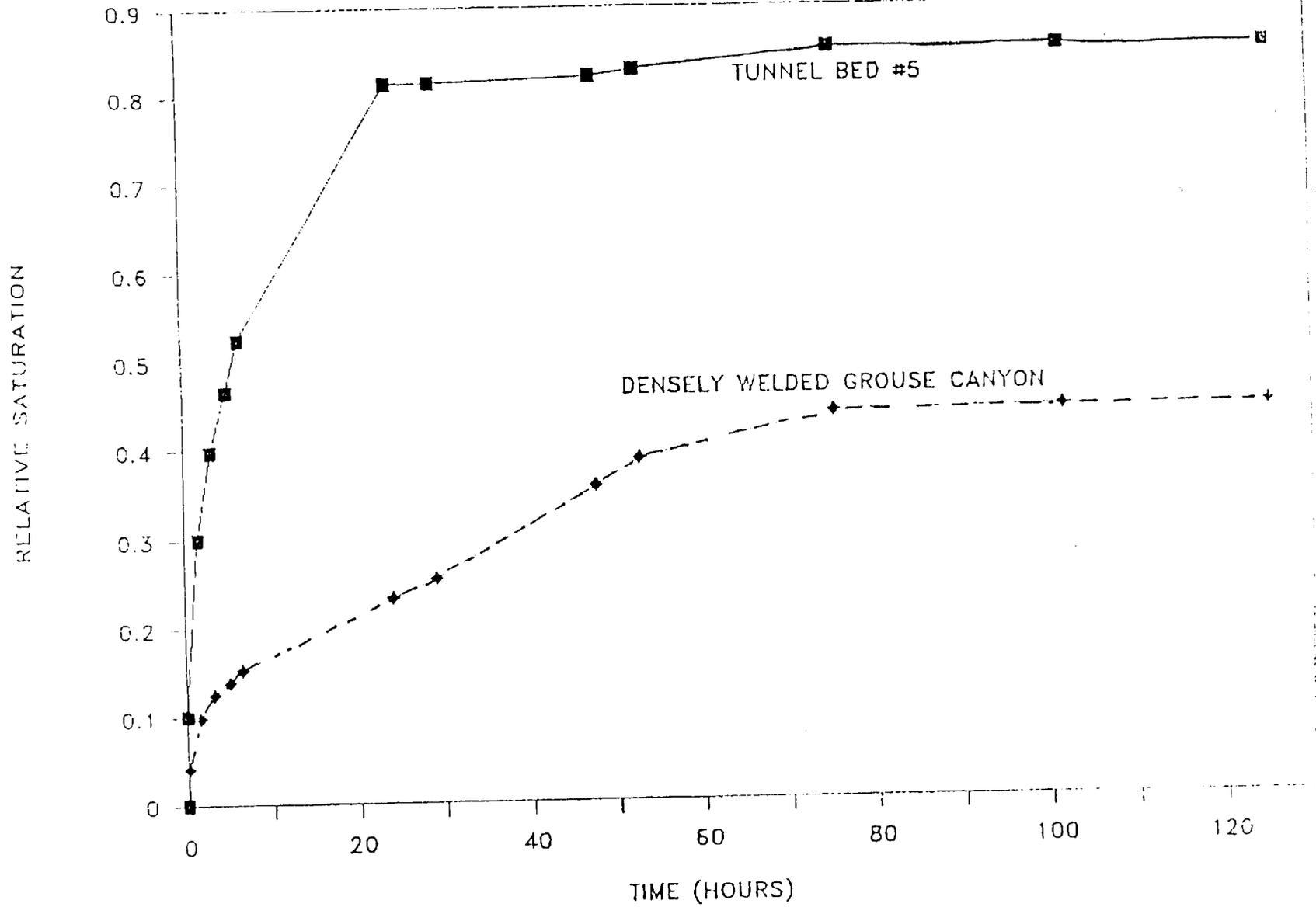
DIRECT SEMIVARIOGRAM

HORIZONTAL VERSUS VERTICAL BOREHOLES

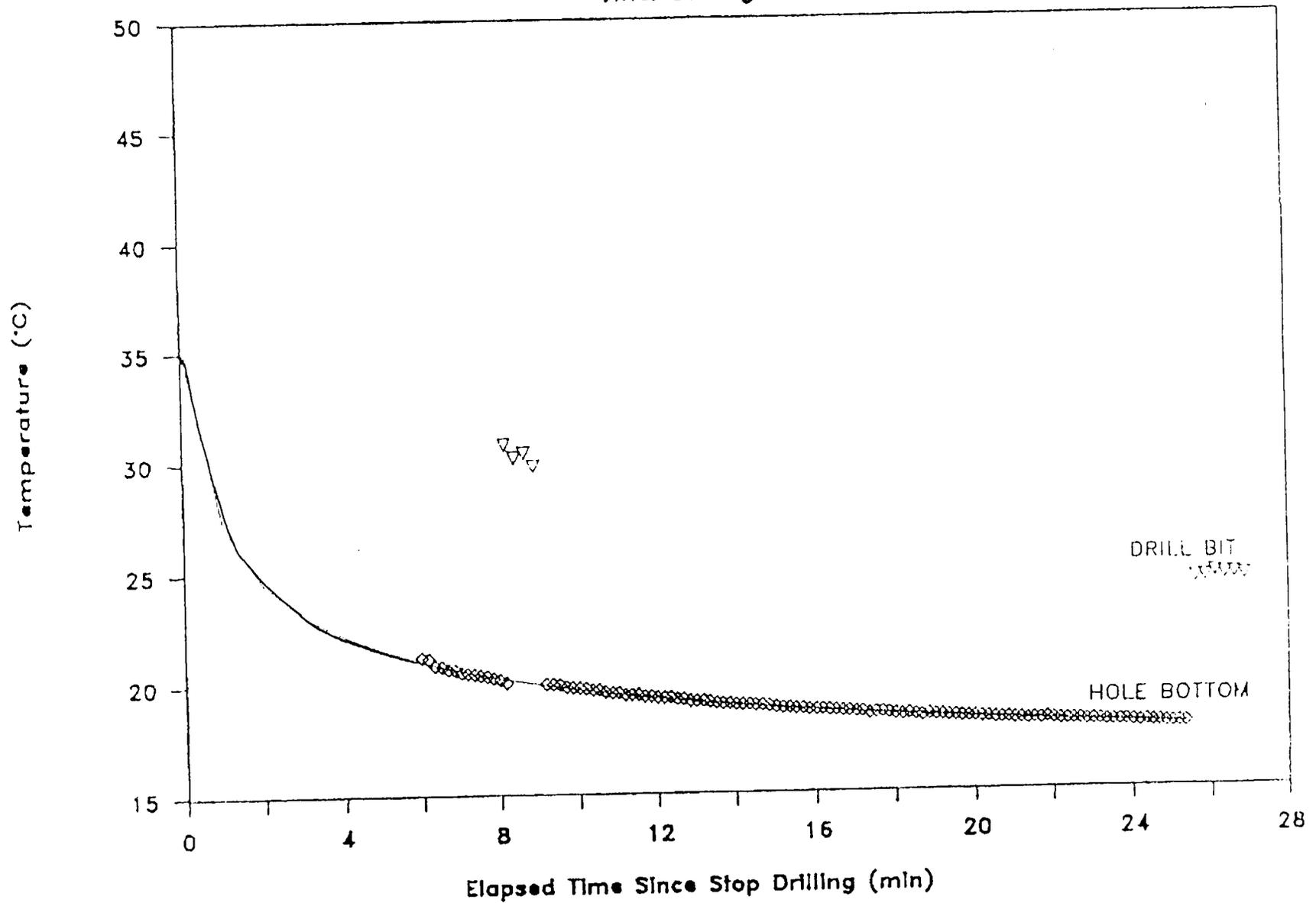


IMBIBITION

FILTER PAPER METHOD



Temperature of Hole & Drill Bit After Drilling



CROSS HOLE PNEUMATIC AND HYDRAULIC TESTING

ACCOMPLISHMENTS:

- ° G-TUNNEL CORING IS 50% COMPLETE. TWO PARALLEL HOLES WERE DRILLED THROUGH AN EXISTING FAULT.

- ° SPECIALIZED SURVEY EQUIPMENT WAS DEVELOPED TO DETERMINE BOREHOLE DEVIATION.

- ° DEPLOYMENT OF PACKER STRINGS AND INSTRUMENTATION IS PLANNED FOR NOVEMBER.

- ° THE CORES RECOVERED ARE BEING ANALYZED BY H&N.

INTACT FRACTURE TEST

ACCOMPLISHMENTS:

- LACK OF FUNDING HAMPERED ANY SIGNIFICANT WORK. SOME HARDWARE WAS ORDERED.
- PROCEDURE FOR SAMPLING WAS PREPARED AND HAS UNDERGONE PROJECT REVIEW.

INTACT FRACTURE TEST - LABORATORY ANALYSIS

ACCOMPLISHMENTS:

- ° SIGNIFICANT PROGRESS WAS MADE DURING FY 1988 WITH THE QA DOCUMENTATION FOR THE LABORATORY DATA COLLECTION SYSTEM.

- ° SAMPLES OF FRACTURES ARE BEING ANALYZED AND PROCEDURES ARE BEING WRITTEN.

DRILL HOLE INSTRUMENTATION

ACCOMPLISHMENTS:

- ° DESIGNED AND CONSTRUCTED LOW PRESSURE PACKER INFLATION SYSTEM FOR USE IN 3.79 IN. TO 4.12 IN. DIAMETER DRILL HOLES.

- ° CORED AND LOGGED 15 FT. VERTICAL AND 150 FT. HORIZONTAL HOLES FOR INSTALLATION OF INSTRUMENTS.

- ° CONDUCTED LABORATORY TESTS ON DOWNHOLE SENSORS, THERMISTORS, PRESSURE TRANSDUCERS, THERMOCOUPLE PSYCHROMETERS.

- ° PREPARATIONS ARE UNDERWAY TO DEPLOY INSTRUMENT PACKAGES IN BOREHOLES.

INFILTRATION TEST

ACCOMPLISHMENTS:

- ° DEVELOP METHODOLOGY FOR REMOVING BLOCK IN THE G TUNNEL FOR TESTING.

- ° DETAILED TEST PLAN HAS BEEN DEVELOPED. EXTENSIVE LITERATURE SEARCH HAS BEEN COMPLETED TO REVIEW INSTRUMENTATION TECHNIQUES AND SYSTEMS SUCH AS FIBER OPTICS ELECTRICAL IMPEDENCE TOMOGRAPHY.

- ° LABORATORY MONITORING AND DATA ACQUISITION EQUIPMENT WAS PROCURED AND ASSEMBLED AND PRELIMINARY CALIBRATION WORK WAS INITIATED.

- ° DRILLING REQUIREMENTS FOR SMALL AND LARGE BLOCKS HAVE BEEN EVALUATED AND EQUIPMENT PROCURED AND TESTED AT NTS FOR:
 - ° DRILLING 1/2 INCH HOLES IN MATRIX BLOCKS.
 - ° DESIGN AND ASSEMBLY OF INJECTION PACKER SYSTEM.
 - ° AIR FLOW TESTS TO DETERMINE FRACTURE INTERSECTIONS WITHIN THE BOREHOLE.

PROTOTYPE TRACER TESTING (GAS AND WATER)

ACCOMPLISHMENTS:

- ° CONDUCTED COMPREHENSIVE LITERATURE SEARCH FOR SUITABLE TRACERS.
- ° DEVELOPED QA PROCEDURES FOR LABORATORY CHARACTERIZATION OF TUFFACEOUS ROCKS AND TRACER SORPTION BEHAVIOR.
- ° SELECTED BROMIDE AND IODIDE AS TRACERS TO COMPARE WITH TRITIUM AND OXYGEN-18 (IN WATER)
- ° PERFORMED PRELIMINARY LABORATORY TEST OF BORATE SORPTION BEHAVIOR ON G-TUNNEL ROCKS.

PORE WATER EXTRACTION

ACCOMPLISHMENTS:

- ° THREE METHODS ARE BEING EVALUATED TO EXTRACT PORE WATER AND GAS FROM TUFFS:
 - ° TRIAXIAL COMPRESSION AND
 - ° UNIAXIAL COMPRESSION.

(TRIAIXIAL COMPRESSION HAS BEEN USED FOR EXTRACTION OF WATER FROM NON WELDED TUFF. THE UNIAXIAL EQUIPMENT IS BEING FABRICATED.)

- ° OBTAIN SAMPLES FROM G-TUNNEL FOR TESTING.

THERMAL STRESS TEST

ACCOMPLISHMENTS:

- ° DEVELOPED, FABRICATED AND DEMONSTRATED FLATJACK PRESSURE CONTROL SYSTEM.

- ° DESIGNED AND FABRICATED NEW APPARATUS TO MECHANICALLY FEED THE 1-M CHAIN SAW FOR CUTTING SLOTS.

- ° PROCURED AND EVALUATED THERMAL INSULATION SYSTEM

- ° REVISED EXPERIMENTAL PROCEDURE.

DIFFUSION TEST

ACCOMPLISHMENTS:

- ° AIR CORED VERTICAL HOLE IN G-TUNNEL TO LOCATE RUBBLE ZONE BENEATH GROUSE CANYON B LAYER.
- ° AIR CORED VERTICAL HOLE IN GROUSE CANYON FOR DIFFUSION TEST.
- ° AIR CORED VERTICAL HOLE IN TUNNEL BED 5 TUFF FOR DIFFUSION TEST.
- ° MEASURED MOISTURE CONTENT IN DRILL HOLES TO OBSERVE REHYDRATION AFTER AIR CORING.
- ° AIR CORED SMALL DIAMETER HOLES FOR DIFFUSION TRACER EMPLACEMENT.
- ° BUILT WORKING SYSTEM TO INJECT 20 PPM BR-1 (TRACER) INTO J-13 WATER SUPPLY LINE.

AIR CORING

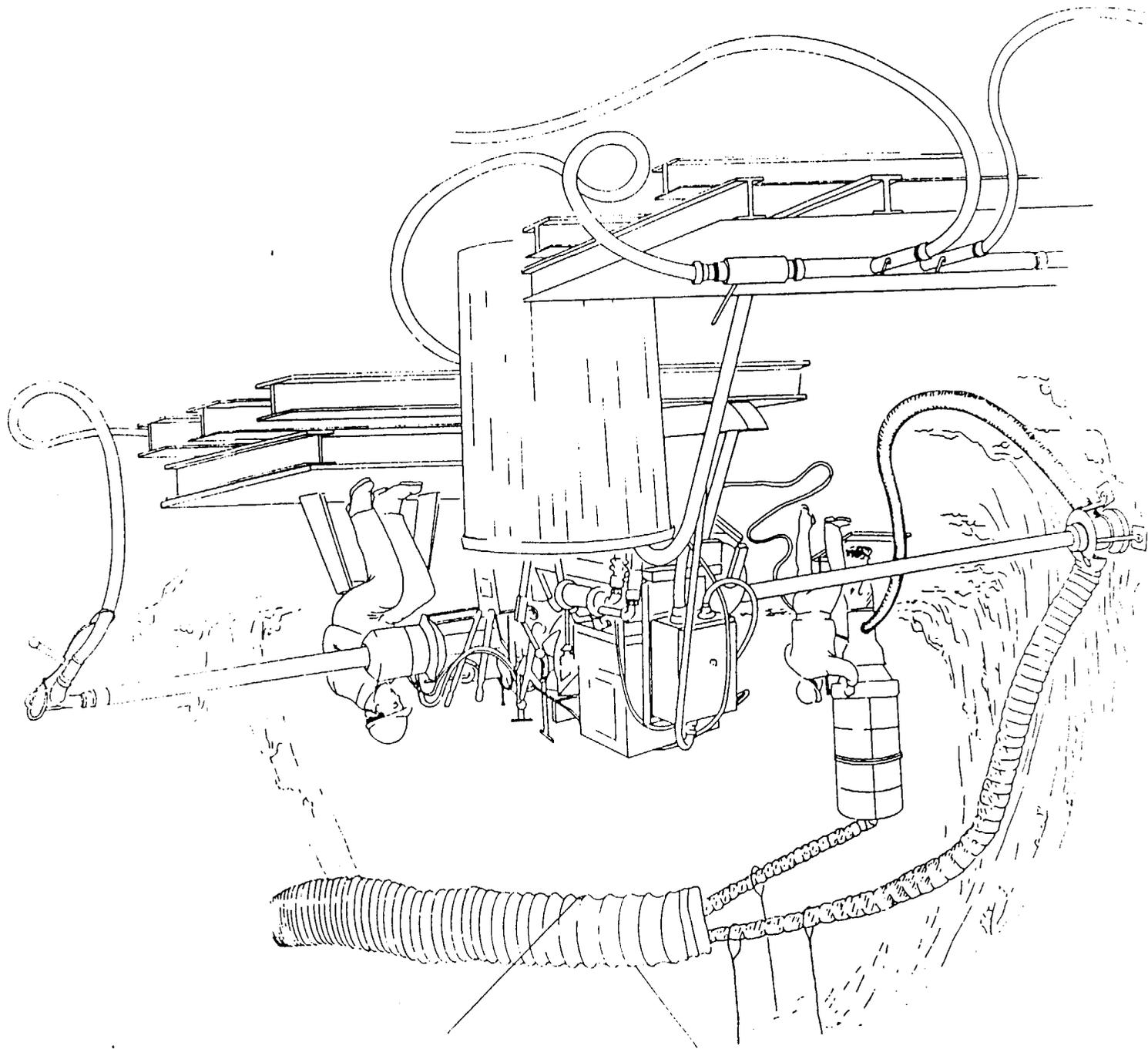
ACCOMPLISHMENTS:

- ° SUCCESSFULLY DRILLED UP TO 150 FT. DEEP HORIZONTAL CORE HOLES USING AIR AS CIRCULATING MEDIUM.

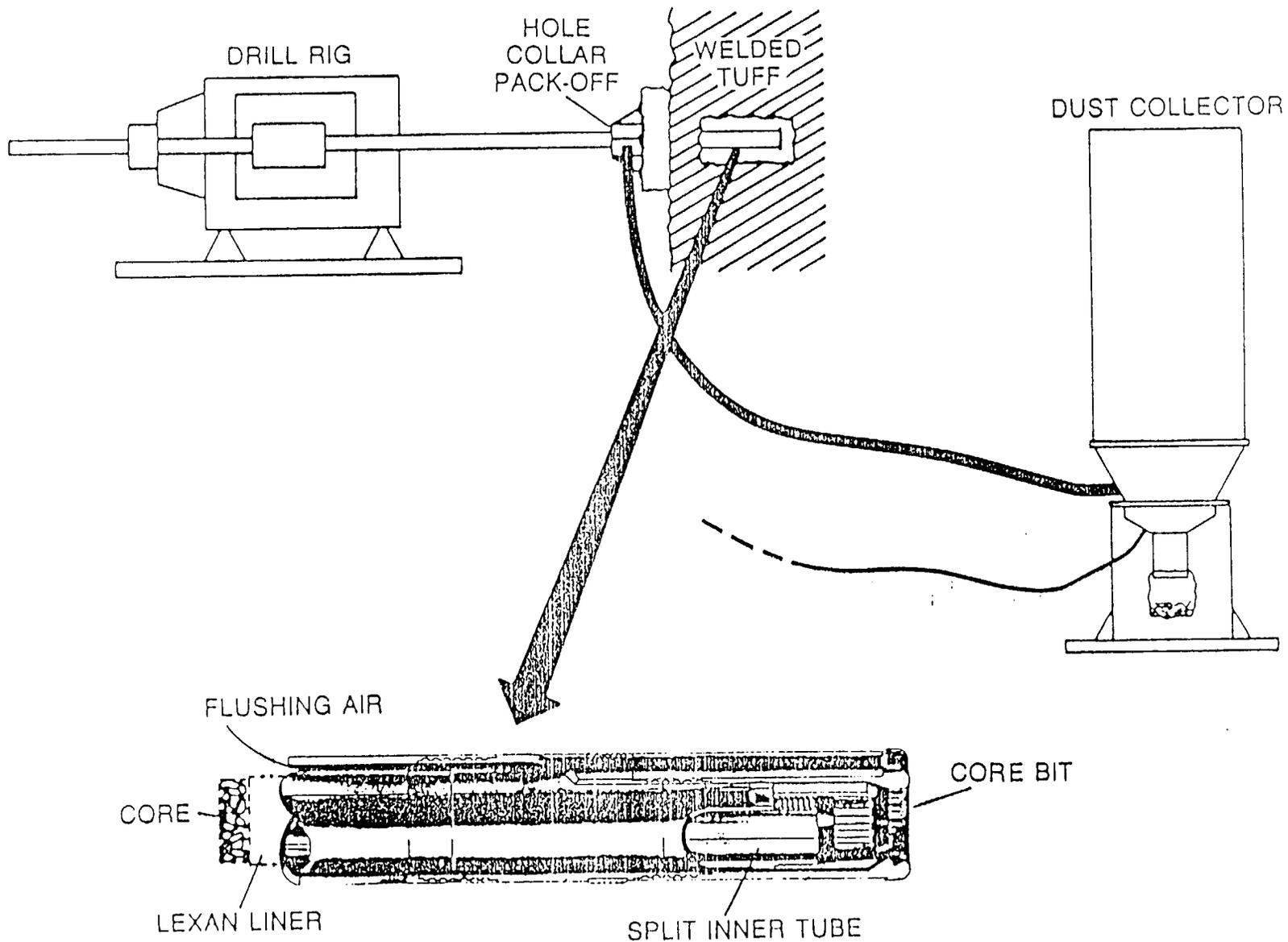
- ° EVALUATED DUST COLLECTION SYSTEM, CORING EFFICIENCY, CORE QUALITY AND PROCEDURAL DEFICIENCIES.

- ° CORE RECOVERY WAS 97%.

- ° EVALUATED HOLE DEVIATION, HOLE STABILITY AND LEXAN LINERS FOR STORING RECOVERED CORE.



EQUIPMENT CONFIGURATION



HEALTH HAZARDS ASSOCIATED WITH DRILLING

ACCOMPLISHMENTS:

- ° THE FIELD STUDY WAS PERFORMED DURING PROTOTYPE AIR-CORING.
 - ° SAMPLE ANALYSIS HAS BEEN COMPLETED.
 - ° DRAFT REPORT IS IN PREPARATION.

- ° ANALYTICAL DATA INDICATES:
 - ° CRYSTALLINE SILICA NOT A SIGNIFICANT PROBLEM.
 - ° NO ZEOLITE FIBERS IDENTIFIED IN G-TUNNEL AIR SAMPLES.

- ° THE DUST CONTROL SYSTEM, AS TESTED, IS EFFECTIVE.

ENGINEERED BARRIER TEST

ACCOMPLISHMENTS:

- ° THIS TEST HAS BEEN COMMISSIONED FOR HORIZONTAL MODE.
- ° THE HEATING PHASE OF THE TEST IS SCHEDULED TO LAST FOR ABOUT 23 WEEKS. THE COOLING PHASE OF THE TEST WILL TAKE 8 WEEKS.
- ° AFTER THE TEST HAS BEEN COMPLETED OVERCORING WILL BE DONE AT SEVERAL LOCATIONS TO COLLECT SAMPLES AND TO ASSESS THE INSTRUMENTATION USED.
- ° DATA ACQUISITION SYSTEM DESIGNED, FABRICATED AND INSTALLED.

SUMMARY

PROTOTYPE TESTING HAS BEEN INITIATED IN THE G-TUNNEL AND IS BEING USED FOR DEVELOPING TEST PROCEDURES AND TECHNIQUES PLANNED FOR THE ESF FOR CHARACTERIZATION TESTING.

THE POINT PAPERS BY NRC SUGGEST THAT PROTOTYPE TESTING SHOULD BE UNDERTAKEN TO FINE TUNE SOME OF THE TESTS.

PROTOTYPE TESTING IS PROVIDING INFORMATION ON INSTRUMENTS SELECTED FOR INSTALLATION IN THE ESF.

THE PROTOTYPE TESTING OPERATIONS AT G-TUNNEL WERE VISITED BY PROJECT PARTICIPANTS AND FOREIGN NATIONALS, AS WELL AS REPRESENTATIVES FROM HQ.

EXCELLENT COOPERATION HAS EXISTED BETWEEN THE PARTICIPANTS.

METHODOLOGIES DEVELOPED FOR TESTS IN THE G-TUNNEL ARE ADAPTABLE FOR ESF TESTING.

DRAFT

FY 1989 PROJECT GOALS

WBS 1.2.1. SYSTEMS

- * Implement Technical Data Management Plan, AP 5.2Q, 5.3Q and complete participant implementing procedures.
- * Implement OCRWM Performance Assessment Management Plan and develop Project Performance Assessment Plan.
- * Conduct level I analysis of items and activities important to safety and waste isolation needed to start pad and ESF construction.

Issue Draft Yucca Mountain Mined Geologic Disposal System Description.

Issue Draft Yucca Mountain Mined Geologic System and Subsystem Requirements.

Update Reference Information Base for Start of ACD.

WBS 1.2.2 WASTE PACKAGE

Start Horizontal Prototype Engineered Barrier Tests

Issue Draft Waste Package Postclosure Compliance Strategy Document

Issue Reference Draft Waste Package Design Requirements

Issue Performance Assessment Methodology for Waste Package Report

Complete Waste Package pre-ACD Studies

Complete Report on Recommendations of Waste Package and Packing Materials

WBS 1.2.3 SITE INVESTIGATIONS

Initiate Air Quality Monitoring

Start Shallow Seismic Reflection and Refraction Surveys

Start Prototype Drilling for Deep, Dry Unsaturated Zone Boreholes

- * Initiate Trenching Studies in Midway Valley for Surface Facility Location

Start Multi-Purpose Borehole Drilling

Start Unsaturated Zone Drilling

Sample Management Facility Operational

WBS 1.2.4. REPOSITORY INVESTIGATIONS

Issue Report on Effects of ESF on Repository Performance Assessment

Issue the Repository Design Requirements Document

Issue Report on Sealing Conceptual Design for Repository ACD

Complete Thirteen Repository Investigations pre-ACD Studies

Complete Horizontal Waste Emplacement Option Study

WBS 1.2.5. REGULATORY AND INSTITUTIONAL

Initiate Radiological Monitoring Data Collection

- * Issue Site Characterization Plan to the NRC and the Public
- * Conduct Public Hearings on SCP
- * Produce Comment Response Document for NRC, EEI, NV, and other Comments
- * Prepare SCP Progress Report Incorporating Changes to Chapter 8
- * Conduct NRC Meetings in Accordance with NRC Request on 6 Topics

Prepare Review and Approve and Submit to NRC 50 Study Plans to Support Site Characterization (17 due 4/89, remaining due throughout FY 89)

- * Implement the Licensing Support Management Plan (TSMP)
- * Implement Licensing Plan (NRC Interaction)

WBS 1.2.6. EXPLORATORY SHAFT INVESTIGATIONS

Start ESF Title II Design

Submit Initial Exploratory Shaft Test Study Plans with the SCP

Start ESF Site Preparation

Start First Shaft (ES-1) Construction

Start Second Shaft (ES-2) Construction

WBS 1.2.8. LAND ACQUISITION

Approval of Land Access Agreements

WBS 1.2.9. PROJECT MANAGEMENT

Implementation of Fully Qualified Quality Assurance Program

Operation of Enhanced Project Control System

Establish Long Range Planning Baseline

Issue the Twelve Project Level Management System Plans

FY 89 GOALS

- 12/88 Issue SCP and Accompanying Study Plans
- * 1/89 Start Prototype Bore Hole Drilling
 - 1/89 Initial LRP package complete
 - 1/89 Start Pad and Site Preparation
- * 3/89 Conduct Public Hearings on SCP
 - 3/89 Interactions between DOE and NRC, State on Comments on SCP/ES
- * 4/89 Start Midway Valley Trenching
 - 4/89 Start Unsaturated Zone Bore Hole Drilling
 - 4/89 Start MPBH Bore Hole Drilling
- * 6/89 Issue CRD and SCP Progress Report
 - 6/89 QA program qualified
- * 6/89 Receive NRC Site Characterization Analysis
 - 7/89 ESF Construction Commence
- 9/89 Implement Licensing Support Management Plan (TSMP)

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
MAJOR SYSTEMS ACQUISITION (MSA) MILESTONES

MILESTONE NUMBER	MILESTONE DESCRIPTION	WBS NUMBER
*	IMPLEMENT PERFORMANCE ASSESSMENT MANAGEMENT PLAN & DEVELOP PROJECT PERFORMANCE ASSESSMENT PLAN	
M261	DRAFT YUCCA MOUNTAIN MINED GEOLOGIC DISPOSAL SYSTEM DESCRIPTION ISSUED	1.2.1
M120	DRAFT YUCCA MOUNTAIN MINED GEOLOGIC DISPOSAL SYSTEM & SUBSYSTEM REQUIREMENTS ISSUED	1.2.1
P223	PROJECT ISSUES UPDATED REFERENCE INFORMATION BASE FOR START OF ACD	1.2.1
P122	PROJECT ISSUES SYSTEMS STUDY REGISTER FOR ACD	1.2.1
P039	SYSTEMS ENGINEERING REVIEW OF PROJECT COMPLETED	1.2.1
*	CONDUCT LEVEL I ANALYSIS OF ITEMS AND ACTIVITIES IMPORTANT TO SAFETY AND WASTE ISOLATION NEEDED TO START PAD AND ESF CONSTRUCTION	1.2.1
M260	REPORT ON LONG-TERM WASTE PACKAGE PERFORMANCE ANALYSIS ISSUED	1.2.2
M257	DECISION ON PACKING MATERIAL FOR WASTE PACKAGE ISSUED	1.2.2
P250	PROJECT BEGINS PARAMETRIC DISSOLUTION TEST OF SPENT FUEL	1.2.2
R003	DRAFT WASTE PACKAGE POSTCLOSURE COMPLIANCE STRATEGY DOCUMENT ISSUED	1.2.2
M013	REFERENCE DRAFT OF WASTE PACKAGE DESIGN REQUIREMENTS ISSUED	1.2.2
M369	PROJECT ISSUES STATUS REPORT ON REGIONAL GEOPHYSICS	1.2.3
N345	PROJECT BEGINS AIR QUALITY MONITORING	1.2.3
P970	PROJECT COMMENCES RADIOLOGICAL MONITORING DATA COLLECTION	1.2.3
*	PROJECT INITIATES TRENCHING STUDIES IN MIDWAY VALLEY FOR SURFACE FACILITY LOCATION	1.2.3
P142	PROJECT STARTS SAMPLE MANAGEMENT FACILITY OPERATIONS	1.2.3
R845	RECOMMENDATION ON WHETHER TO PROCEED WITH DEEP SEISMIC SURVEY ISSUED	1.2.3
Q090	PROJECT BEGINS UNSATURATED ZONE HYDROLOGIC HOLE DRILLING	1.2.3
T286	PROJECT BEGINS GEOLOGIC COREHOLE DRILLING	1.2.3
Q086	PROJECT BEGINS SATURATED ZONE HYDROLOGIC HOLE DRILLING	1.2.3
T288	PROJECT BEGINS SMALL PLOT RAINFALL SIMULATION TEST DRILLING	1.2.3
T275	PROJECT BEGINS NATURAL INFILTRATION MONITORING DRILLING	1.2.3
Q089	PROJECT BEGINS LARGE PLOT RAINFALL SIMULATION TEST DRILLING	1.2.3
*	PROJECT BEGINS SURFACE BASED INVESTIGATIONS PLAN	1.2.3

T161	HORIZONTAL WASTE EMPLACEMENT OPTION STUDY ISSUED	1.2.4
R036	REPORT ON EFFECTS OF EXPLORATORY SHAFT ON REPOSITORY PERFORMANCE ASSESSMENT ISSUED	1.2.4
N433	REFERENCE DRAFT OF REPOSITORY DESIGN REQUIREMENTS ISSUED	1.2.4
M461	PROJECT ISSUES REPORT ON SEALING CONCEPTUAL DESIGN FOR REPOSITORY ACD	1.2.4
R848	RETRIEVABILITY COMPLIANCE STRATEGY PLAN ISSUED	1.2.4

R799	PROJECT SUBMITS ENVIRONMENTAL FIELD STUDY PLANS	1.2.5
T242	PROJECT OBTAINS ENVIRONMENTAL PERMITS TO ALLOW START OF ESF SITE PREPARATION	1.2.5
M241	PROJECT OBTAINS PERMITS TO ALLOW START OF SURFACE BASED TESTING	1.2.5
R997	PROJECT SUBMITS DRAFT FACILITY SPECIFIC OUTREACH AND PARTICIPATION PLAN	1.2.5
T452	PROJECT ISSUES FACILITY SPECIFIC OUTREACH AND PARTICIPATION PLAN	1.2.5
T248	PROJECT BEGINS ENVIRONMENTAL IMPACT STATEMENT SCOPING PROCESS	1.2.5
* M522	ISSUE SITE CHARACTERIZATION PLAN TO THE NRC AND THE PUBLIC	1.2.5
*	CONDUCT PUBLIC HEARINGS ON SCP	1.2.5
* M790	PRODUCE COMMENT RESPONSE DOCUMENT FOR NRC, EEI, NV AND OTHER COMMENTS	1.2.5
* N097	PREPARE SCP PROGRESS REPORT INCORPORATING CHANGES TO CHAPTER 8	1.2.5
*	COMPLETE 50 STUDY PLANS FOR SUBMITTAL TO NRC (NOTE - EACH SP CARRIES A SEPARATE MILESTONE)	1.2.5
*	PROJECT IMPLEMENTS LICENSING SUPPORT MANAGEMENT PLAN (TSMP)	1.2.5

P763	PROJECT ISSUES DRAFT ESF TITLE I DESIGN REPORT	1.2.6
M645	PROJECT STARTS ESF SITE PREPARATION	1.2.6
T271	PROJECT ISSUES ESF DRAFT TITLE II DESIGN REPORT	1.2.6
M646	PROJECT COMPLETES CONSTRUCTION OF ESF SURFACE FACILITIES	1.2.6
M647	PROJECT STARTS SECOND SHAFT (ES-2) CONSTRUCTION	1.2.6
M652	PROJECT STARTS FIRST SHAFT (ES-1) CONSTRUCTION	1.2.6

R988	PROJECT SIGNS LAND ACCESS AGREEMENTS	1.2.6
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T331	PROJECT SUBMITS FY 1989 COST PLAN	1.2.9
T400	PROJECT ISSUES UPDATED NNWSI PROJECT PLAN	1.2.9
R104	PROJECT SUBMITS FY 1991 BUDGET (WAS)	1.2.9

SIG DOCUMENT REVIEW LOG
SORTED BY DOCUMENT NUMBER
20 SEP 1988

88-1233 TECHNICAL REPORT LLNL DISPUTE RESOLUTION

"SPENT FUEL PERFORMANCE DATA: AN ANALYSIS OF DATA RELEVANT TO THE NNWSI PROJECT" BY V.M. OVERSBY AND H.F. SHAW.
MILESTONE# T222 LEVEL II. (NNA.880407.0023)

Received: 21 Mar 88 Due: 06 Apr 88 Comments/ none: ed/gram: suggestion: major: X
Comments Resolved: NO Comments Disposition: REJECT Dispute: YES Dispute Resolved: NO
Revision: REQUIRED Revision: Published: Published date:
Com_to_WMPO: 07 Apr 88 Com_disp_WMPO: 17 May 88 status: OPEN

 STAHL,DAVE 04 Apr 88 MANAGEMENT
 STAHL,DAVE 17 May 88 DISPOSITION

88-1307 TECHNICAL REPORT USGS COMMENT RESOLUTION

"GEOHYDROLOGIC DATA FROM TEST HOLE UZ-7, YUCCA MOUNTAIN AREA, NYE COUNTY, NEVADA" BY J. KUME AND D. HAMMERMEISTER.
(NNA.880407.0022) (NNA.880509.0017)

Received: 22 Mar 88 Due: 08 Apr 88 Comments/ none: ed/gram: suggestion: major: X
Comments Resolved: YES Comments Disposition: ACCEPT Dispute: Dispute Resolved:
Revision: REQUIRED Revision: Published: Published date:
Com_to_WMPO: 07 Apr 88 Com_disp_WMPO: 09 May 88 status: OPEN

 GOINGS,DAVE 29 Mar 88 MANAGEMENT
 GOINGS,DAVE 09 May 88 DISPOSITION
 GOINGS,DAVE 31 May 88 FINAL DISPOSITION

88-1308 TECHNICAL REPORT LANL COMMENT RESOLUTION

"TRANSPORT BY MICROORGANISMS: CHELATION" BY L.E. HERSMAN. MILESTONE# T187 LEVEL II.
(NNA.880523.0006)

Received: 22 Mar 88 Due: 08 Apr 88 Comments/ none: ed/gram: X suggestion: X major:
Comments Resolved: Comments Disposition: Dispute: Dispute Resolved:
Revision: Revision: Published: Published date:
Com_to_WMPO: 23 May 88 Com_disp_WMPO: status: OPEN

 RUTLAND,CAROLYN 10 May 88 MANAGEMENT

This status reports accounts for documents received in Systems Integration and does not include document reviews initiated by other departments.

574 Total documents received since January 1987.

153 Total documents entered into the data base so far.

421 Remaining documents to be entered into the data base, which have been reviewed and are in various stages.

Of the 153 documents in the data base the number submitted by each Participant is as follows:

6 DOE/NV or DOE/HQ
20 LANL
26 LLNL
46 SNL
15 T&MSS
39 USGS
1 E R JOHNSON

REVIEW STAGES ARE AS FOLLOWS:

STAGE 1 - INITIATE REVIEW
STAGE 2 - REVIEW PROCESS
STAGE 3 - COMMENT RESOLUTION
STAGE 4 - VERIFICATION
STAGE 5 - DISPUTE RESOLUTION
STAGE 6 - APPROVAL

The number of documents in each stage for each Participant (as of 9-20-88) is as follows:

	<u>STAGE 1</u>	<u>STAGE 2</u>	<u>STAGE 3</u>	<u>STAGE 4</u>	<u>STAGE 5</u>	<u>STAGE 6</u>
DOE	0	0	4	0	0	2
LANL	0	5	12	0	0	3
LLNL	0	1	17	0	1	7
SNL	0	11	26	0	0	9
T&MSS	7	6	1	0	0	1
USGS	1	11	14	0	0	13
ER J	0	0	1	0	0	0
TOTAL	8	34	75	0	1	35

9/2/77

W .ET
Proposed WBS to match BCP-B-162

WBS Element

SCP Section

Participants

1.2.1 SYSTEMS

1.2.1.1 MANAGEMENT AND INTEGRATION

SNL, LLNL, T&MSS, LANL, USGS

1.2.1.2 SYSTEMS ENGINEERING

1.2.1.2.1 System Requirements and Description

SNL

1.2.1.2.2 System Studies

SNL

1.2.1.2.3 Yucca Mountain-MGDS Total System Life Cycle Cost

SNL

1.2.1.2.4 Systems Engineering Implementation

SNL, LANL, F&S, USGS, H&N, LLNL,
REECo, T&MSS

1.2.1.2.5 Configuration Management and Change Control

T&MSS

1.2.1.3 TECHNICAL DATA BASE MANAGEMENT

1.2.1.3.1 Site and Engineering Properties Data Base

SNL

1.2.1.3.2 Interactive Graphics Information
System

SNL

1.2.1.3.3 Reference Information Base

SNL

1.2.1.3.4 Computer Support

SNL

1.2.1.3.5 Technical Data Base Implementation

SNL, LANL, F&S, USGS, H&N, LLNL,
REECo, T&MSS

1.2.1.4 PERFORMANCE ASSESSMENT

1.2.1.4.1 Total System Performance Assessment

SNL

1.2.1.4.2 Waste Package Performance Assessment

LLNL

1.2.1.4.3 Repository Performance Assessment

1.2.1.4.3.1 Postclosure Repository Design Analyses (1.11)

SNL

1.2.1.4.3.2 Preclosure Radiological Safety
Analyses (2.1-2.4)

SNL

W. .CET
Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.1.4.3.3 Waste Retrieval Requirements and Analyses (2.4)		SNL
1.2.1.4.3.4 Seal Performance Requirements and Analyses(1.12)		SNL
1.2.1.4.4 Site Performance Assessment		
1.2.1.4.4.1 Pre-waste-emplacment Ground-Water Travel Time (1.6)		SNL
1.2.1.4.4.2 Favorable and Adverse Conditions (1.*)		SNL, LLNL, LANL, USGS, T&MSS
1.2.1.4.4.3 Higher Level Findings (1.9)		SNL, LLNL, LANL, USGS, T&MSS
1.2.1.4.5 Performance Code Development & Verification		SNL, LLNL
1.2.1.4.6 Performance Model Development and Validation		SNL, LLNL
1.2.1.4.7 Supporting Calculations for Postclosure Performance Analyses		SNL, LLNL, LANL, USGS, T&MSS
1.2.1.4.8 Performance Confirmation (1.7)		SNL, LLNL, LANL, USGS, T&MSS
1.2.2 WASTE PACKAGE		
1.2.2.1 MANAGEMENT AND INTEGRATION		LLNL, T&MSS, REECo
1.2.2.2 WASTE PACKAGE ENVIRONMENT	8.3.4.2.4	
1.2.2.2.1 Chemical and Mineralogic Changes in the Postemplacment Environment	8.3.4.2.4.1	LLNL
1.2.2.2.2 Hydrologic Properties of Waste Package Environment	8.3.4.2.4.2	LLNL
1.2.2.2.3 Mechanical Attributes	8.3.4.2.4.3	LLNL

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.2.2.4 Engineered Barrier System Field Tests	8.3.4.2.4.4	LLNL, F&S, H&N, REECo
1.2.2.3 WASTE FORM AND MATERIALS TESTING		
1.2.2.3.1 WASTE FORM		
1.2.2.3.1.1 Waste Form Testing - Spent Fuel		LLNL, T&MSS
1.2.2.3.1.2 Waste form testing - Glass		LLNL, T&MSS
1.2.2.3.2 METAL BARRIERS		LLNL
1.2.2.3.3 OTHER MATERIALS		LLNL
1.2.2.3.4 INTEGRATED TESTING		
1.2.2.3.4.1 Integrated Radionuclide Release: Tests and Model		LLNL
1.2.2.3.4.2 Thermodynamic Data Determination		LLNL
1.2.2.3.5 Alternate Barrier		LLNL
1.2.2.4 DESIGN, FABRICATION, AND PROTOTYPE TESTING		
1.2.2.4.1 Design and Analysis		LLNL, T&MSS
1.2.2.4.2 Process Development and Prototype Testing		LLNL, T&MSS
1.2.3 SITE		
1.2.3.1 MANAGEMENT AND INTEGRATION		T&MSS, LANL, SNL, EG&G. USGS, H&N
1.2.3.2 GEOLOGY		
1.2.3.2.1 Mineralogy and Petrology	8.3.1.3	

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.2.1.1 Mineralogy, Petrology, and Rock Chemistry	8.3.1.3.2	
1.2.3.2.1.1.1 Mineralogy, petrology, and rock chemistry of transport pathways	8.3.1.3.2.1	LANL
1.2.3.2.1.1.2 Mineralogic and geochemical alteration	8.3.1.3.2.2	LANL
1.2.3.2.1.2 Stability of Minerals and glasses	8.3.1.3.3	LANL
1.2.3.2.1.2.1 Natural analog of hydrothermal systems in tuff	8.3.1.3.3.1	LANL
1.2.3.2.1.2.2 Kinetics and thermodynamics of mineral evolution	8.3.1.3.3.2	LANL
1.2.3.2.1.2.3 Conceptual model of mineral evolution	8.3.1.3.3.3	LANL
1.2.3.2.2 Rock Characteristics	8.3.1.4	
1.2.3.2.2.1 Geologic framework of the Yucca Mountain Site	8.3.1.4.2	
1.2.3.2.2.1.1 Vertical and lateral distribution stratigraphic units in the site area	8.3.1.4.2.1	USGS
1.2.3.2.2.1.2 Structural features in the site area	8.3.1.4.2.2	USGS, LBL, F&S
1.2.3.2.2.1.3 Three-dimensional geologic model	8.3.1.4.2.3	USGS
1.2.3.2.2.2 Systematic Acquisition of Data for 3-D models of Rock Characteristics	8.3.1.4.3	SNL

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.2.3 Erosion	8.3.1.6	
1.2.3.2.3.1 Present location and rates of surface erosion	8.3.1.6.1	USGS
1.2.3.2.3.2 Effects of future climate conditions on erosion	8.3.1.6.2	USGS
1.2.3.2.3.3 Effects of tectonic activity on erosion	8.3.1.6.3	USGS
1.2.3.2.4 Rock dissolution	8.3.1.7	TBD
1.2.3.2.5 Postclosure tectonics	8.3.1.8	
1.2.3.2.5.1 Direct releases from volcanic activity	8.3.1.8.1	
1.2.3.2.5.1.1 Probability of a volcanic eruption penetrating the repository	8.3.1.8.1.1	LANL
1.2.3.2.5.1.2 Effects of a volcanic eruption penetrating the repository	8.3.1.8.1.2	LANL
1.2.3.2.5.2 Rupture of waste packages due to tectonic events	8.3.1.8.2	TBD
1.2.3.2.5.3 Changes in hydrology due to tectonic events	8.3.1.8.3	
1.2.3.2.5.3.1 Effects of tectonic processes events on average percolation flux rates over the repository	8.3.1.8.3.1	USGS
1.2.3.2.5.3.2 Effect of tectonic processes and events on changes in water-table elevation	8.3.1.8.3.2	USGS

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.2.5.3.3 Effects of tectonic processes and events on local fracture permeability and effective porosity	8.3.1.8.3.3	USGS
1.2.3.2.5.4 Changes in rock geochemical properties due to tectonic processes and events	8.3.1.8.4	USGS
1.2.3.2.5.5 Information required by the analysis and assessment investigations of the tectonics program	8.3.1.8.5	
1.2.3.2.5.5.1 Characterization volcanic features	8.3.1.8.5.1	LANL
1.2.3.2.5.5.2 Characterization of igneous intrusive features	8.3.1.8.5.2	USGS
1.2.3.2.5.5.3 Folds in Miocene and younger rocks of region	8.3.1.8.5.3	USGS
1.2.3.2.6 Surface Characteristics	8.3.1.14	
1.2.3.2.6.1 Topographic characteristics of potential locations of surface facilities	8.3.1.14.1	USGS
1.2.3.2.6.2 Soil and rock properties of potential locations of surface facilities	8.3.1.14.2	
1.2.3.2.6.2.1 Surface facilities Exploration program	8.3.1.14.2.1	SNL
1.2.3.2.6.2.2 Surface facilities laboratory tests and material property measurements		
property tests	8.3.1.14.2.2	SNL
1.2.3.2.6.2.3 Surface facilities field tests and characterization measurements	8.3.1.14.2.3	SNL

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.2.7 Thermal and Mechanical Properties	8.3.1.15	
1.2.3.2.7.1 Laboratory Thermal/Mechanical Tests	8.3.1.15.1	
1.2.3.2.7.1.1 Laboratory thermal properties	8.3.1.15.1.1	SNL
1.2.3.2.7.1.2 Laboratory thermal expansion testing	8.3.1.15.1.2	SNL
1.2.3.2.7.1.3 Laboratory determination of mechanical properties of intact rock	8.3.1.15.1.3	SNL
1.2.3.2.7.1.4 Laboratory determination of the mechanical properties of fractures	8.3.1.15.1.4	SNL
1.2.3.2.7.2 Ambient stress and thermal conditions	8.3.1.15.2	
1.2.3.2.7.2.1 Site ambient stress conditions	8.3.1.15.2.1	SNL, USGS
1.2.3.2.7.2.2 Site ambient thermal conditions	8.3.1.15.2.2	USGS, SNL
1.2.3.2.8 Preclosure tectonics	8.3.1.17	
1.2.3.2.8.1 Potential for volcanic activity at the site	8.3.1.17.1	TBD
1.2.3.2.8.2 Fault displacement potential at the repository	8.3.1.17.2	SNL, USGS
1.2.3.2.8.3 Vibratory ground motion	8.3.1.17.3	
1.2.3.2.8.3.1 Relevant earthquake sources	8.3.1.17.3.1	USGS
1.2.3.2.8.3.2 Underground nuclear explosion sources	8.3.1.17.3.2	SNL, USGS
1.2.3.2.8.3.3 Ground motion from regional earthquakes and underground nuclear explosions	8.3.1.17.3.3	SNL, USGS
1.2.3.2.8.3.4 Effects of local site geology on surface and subsurface motions	8.3.1.17.3.4	SNL, USGS

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>	
1.2.3.2.8.3.5	Ground motion at the site from controlling seismic events	8.3.1.17.3.5	SNL, USGS
1.2.3.2.8.3.6	Probabilistic seismic hazards analyses	8.3.1.17.3.6	SNL, USGS
1.2.3.2.8.4	Preclosure tectonics data collection and analysis	8.3.1.17.4	
1.2.3.2.8.4.1	Historical and current seismicity	8.3.1.17.4.1	USGS
1.2.3.2.8.4.2	Location and recency of faulting near prospective surface facilities	8.3.1.17.4.2	SNL, USGS
1.2.3.2.8.4.3	Quaternary faulting within 100 km of Yucca Mountain	8.3.1.17.4.3	USGS
1.2.3.2.8.4.4	Northeast-trending fault zone	8.3.1.17.4.4	USGS
1.2.3.2.8.4.5	Detachment faults	8.3.1.17.4.5	USGS
1.2.3.2.8.4.6	Quaternary faulting within the site area	8.3.1.17.4.6	USGS
1.2.3.2.8.4.7	Subsurface geometry and concealed extensions of quaternary faults at Yucca Mountain	8.3.1.17.4.7	USGS
1.2.3.2.8.4.8	Stress field within and proximal to the site area	8.3.1.17.4.8	USGS
1.2.3.2.8.4.9	Tectonic geomorphology of the Yucca Mountain region	8.3.1.17.4.9	USGS
1.2.3.2.8.4.10	Geodetic leveling	8.3.1.17.4.10	USGS
1.2.3.2.8.4.11	Regional lateral crustal movement	8.3.1.17.4.11	USGS
1.2.3.2.8.4.12	Tectonic models and synthesis	8.3.1.17.4.12	USGS
1.2.3.3	HYDROLOGY		
1.2.3.3.1	Geohydrology	8.3.1.2	
1.2.3.3.1.1	Description of the regional hydrologic system	8.3.1.2.1	

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.3.1.1.1 Precipitation monitoring for regional Hydrology	8.3.1.2.1.1	USGS, T&MSS
1.2.3.3.1.1.2 Runoff and streamflow	8.3.1.2.1.2	USGS, REEC _o
1.2.3.3.1.1.3 Regional ground-water flow system	8.3.1.2.1.3	USGS, F&S
1.2.3.3.1.1.4 Regional hydrologic system synthesis and modeling	8.3.1.2.1.4	USGS
1.2.3.3.1.2 Unsaturated zone hydrology	8.3.1.2.2	
1.2.3.3.1.2.1 Unsaturated-zone infiltration	8.3.1.2.2.1	USGS, F&S, H&N
1.2.3.3.1.2.2 Water movement tests	8.3.1.2.2.2	LANL
1.2.3.3.1.2.3 Unsaturated-zone percolation - surface	8.3.1.2.2.3	USGS, F&S, H&N
1.2.3.3.1.2.4 Unsaturated-zone percolation - ESF	8.3.1.2.2.4	USGS, F&S, H&N, REEC _o
1.2.3.3.1.2.5 Diffusion tests - ESF	8.3.1.2.2.5	LANL, F&S, H&N, REEC _o
1.2.3.3.1.2.6 Gaseous-phase movement in the unsaturated zone	8.3.1.2.2.7	USGS
1.2.3.3.1.2.7 Unsaturated-zone hydrochemistry	8.3.1.2.2.8	USGS, F&S
1.2.3.3.1.2.8 Flow in unsaturated-zone fractured rock	8.3.1.2.2.9	USGS, LBL
1.2.3.3.1.2.9 Site unsaturated-zone modeling synthesis, and integration	8.3.1.2.2.10	USGS, LBL
1.2.3.3.1.2.10 ESF Prototype Hydrologic Tests not correlated to a single SCP study		USGS, REEC _o , F&S, H&N
1.2.3.3.1.3 Saturated Zone Hydrology	8.3.1.2.3	
1.2.3.3.1.3.1 Site saturated-zone flow system	8.3.1.2.3.1	USGS, LANL, F&S
1.2.3.3.1.3.2 Saturated-zone hydrochemistry	8.3.1.2.3.2	USGS
1.2.3.3.1.3.3 Saturated-zone system synthesis and modeling	8.3.1.2.3.3	USGS, LBL
1.2.3.3.2 Preclosure Hydrology	8.3.1.16	
1.2.3.3.2.1 Flood and debris hazards at Yucca Mountain surface facilities	8.3.1.16.1	USGS

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.3.2.2 Location of Adequate Water Supplies at Yucca Mountain	8.3.1.16.2	T&MSS, USGS
1.2.3.3.2.3 Ground-water Conditions in the unsaturated-zone within and above the potential host rock	8.3.1.16.3	USGS
1.2.3.4 GEOCHEMISTRY		
1.2.3.4.1 Geochemistry Investigations	8.3.1.3	
1.2.3.4.1.1 Ground-water Chemistry Model	8.3.1.3.1	LANL
1.2.3.4.1.2 Radionuclide Retardation by Sorption Process	8.3.1.3.4	
1.2.3.4.1.2.1 Batch sorption studies	8.3.1.3.4.1	LANL
1.2.3.4.1.2.2 Biological sorption and transport	8.3.1.3.4.2	LANL
1.2.3.4.1.2.3 Sorption models	8.3.1.3.4.3	LANL
1.2.3.4.1.3 Radionuclide retardation by precipitation processes	8.3.1.3.5	
1.2.3.4.1.3.1 Dissolved species concentration limits	8.3.1.3.5.1	LANL
1.2.3.4.1.3.2 Colloid behavior	8.3.1.3.5.2	LANL
1.2.3.4.1.4 Radionuclide retardation by dispersive, diffusive, and advective processes	8.3.1.3.6	
1.2.3.4.1.4.1 Dynamic transport column experiments	8.3.1.3.6.1	LANL
1.2.3.4.1.4.2 Diffusion	8.3.1.3.6.2	LANL

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.4.1.5 Radionuclide retardation by all processes	8.3.1.3.7	
1.2.3.4.1.5.1 Retardation sensitivity analysis	8.3.1.3.7.1	LANL
1.2.3.4.1.5.2 Demonstration of applicability of laboratory data	8.3.1.3.7.2	LANL
1.2.3.4.1.6 Retardation of gaseous radionuclides	8.3.1.3.8	LANL
1.2.3.5 DRILLING		
1.2.3.5.1 Sample Management Facility		T&MSS, REECo, PanAM
1.2.3.5.2 Operational and Engineering Support		
1.2.3.5.2.1 Common-to-drilling and site support	8.3.1	REECo
1.2.3.5.2.2 Road maintenance	8.3.1	REECo
1.2.3.5.2.3 Drillhole engineering, design, inspection, reporting, and services	8.3.1	F&S, H&N, PanAm
1.2.3.5.2.4 Integrated data acquisition system	8.3.1.2.2.3.2	USGS, H&N, REECo, EG&G
1.2.3.5.2.5 Area 25 support		REECo
1.2.3.5.3 Surface Based Investigations Support		
1.2.3.5.3.1 Water Table Drillholes	8.3.1.2.3.1	REECo, H&N
1.2.3.5.3.2 Fortymile Wash Drillholes and pond construction	8.3.1.2.1.3.3	REECo, H&N
1.2.3.5.3.3 Natural Infiltration Drillholes and construction	8.3.1.2.2.1.2	REECo, H&N
1.2.3.5.3.4 Rainfall Simulation/Artificial Infiltration Drillholes and plot construction	8.3.1.2.2.1.3	REECo, H&N

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.5.3.5 Unsaturated zone and vertical seismic profile drillholes and tests	8.3.1.2.2.3.2	REECo, H&N
1.2.3.5.3.6 Solitario Canyon Drillholes and Tests	8.3.1.2.2.3.3	REECo, H&N
1.2.3.5.3.7 Multipurpose boreholes	8.3.1.2.2.4	REECo, H&N
1.2.3.5.3.8 Gas-Phase Circulation Tests in Unsaturated Zone Drillholes	8.3.1.2.2.7.1	REECo, H&N
1.2.3.5.3.9 Gas-Phase Chemical Tests in Unsaturated Zone Drillholes	8.3.1.2.2.8.1	REECo, H&N
1.2.3.5.3.10 USW H-7 Drillholes and Tests	8.3.1.2.3.1.1	REECo, H&N
1.2.3.5.3.11 Water Table Tests	8.3.1.2.3.1.2	REECo, H&N
1.2.3.5.3.12 Multiple Well Interference Tests	8.3.1.2.3.1.4	REECo, H&N
1.2.3.5.3.13 Conservative Tracer Tests	8.3.1.2.3.1	REECo
1.2.3.5.3.14 Southern Tracer Complex Drillholes	8.3.1.2.3.1	
1.2.3.5.3.15 Reactive Tracer Tests	8.3.1.2.3.1	REECo
1.2.3.5.3.16 Saturated-Zone Hydrochemistry Tests	8.3.1.2.3.2	REECo, H&N
1.2.3.5.3.17 Geologic Hole Drillholes	8.3.1.4.2.1	REECo, H&N
1.2.3.5.3.18 Geologic Pavements	8.3.1.4.2.2	REECo, H&N

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.5.3.19 Geostatistical Drillholes	8.3.1.4.3.1	REECo, H&N
1.2.3.5.3.20 Climatology Drillholes	8.3.1.5.1.2	REECo, H&N
1.2.3.5.3.21 Calcite-Silica Drillholes and Trenches	8.3.1.5.2.1	REECo, H&N
1.2.3.5.3.22 Volcanic Drillholes	8.3.1.8.5.1.1	REECo, H&N
1.2.3.5.3.23 Surface Facilities Drillholes	8.3.1.14.2.1	REECo, H&N
1.2.3.5.3.24 Water Supply Drillholes and Tests	8.3.1.16.2.1	REECo, H&N
1.2.3.5.3.25 In situ stress hole and Quaternary Fault Trenches	8.3.1.17.4	REECo, H&N
1.2.3.5.4 Prototype Air Coring		LANL, REECo, F&S, H&N
1.2.3.6 CLIMATOLOGY AND METEOROLOGY		
1.2.3.6.1 Environmental meteorological studies	8.3.1.12	
1.2.3.6.1.1 Regional meteorological conditions	8.3.1.12.1	
1.2.3.6.1.1.1 Characterization of regional meteorological conditions	8.3.1.12.1.1	T&MSS
1.2.3.6.1.1.2 Plan for synthesis of meteorological monitoring	8.3.1.12.1.2	T&MSS
1.2.3.6.1.2 Location of population centers relative to wind patterns	8.3.1.12.3	T&MSS
1.2.3.6.1.3 Potential extreme weather phenomena and their recurrence intervals	8.3.1.12.4	T&MSS
1.2.3.6.2 Climatology		

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.6.2.1 Change in climatic conditions	8.3.1.5	
1.2.3.6.2.1.1 Modern regional climate	8.3.1.5.1.1	USGS
1.2.3.6.2.1.2 Paleoclimate study: lake, playa, marsh deposits	8.3.1.5.1.2	USGS
1.2.3.6.2.1.3 Climatic implications of terrestrial paleoecology	8.3.1.5.1.3	USGS
1.2.3.6.2.1.4 Paleoenvironmental history of the Yucca Mountain region	8.3.1.5.1.4	USGS
1.2.3.6.2.1.5 Paleoclimate-paleoenvironmental synthesis	8.3.1.5.1.5	USGS
1.2.3.6.2.1.6 Future regional climate and environments	8.3.1.5.1.6	USGS
1.2.3.6.2.2 Effects of future climate conditions on hydrologic characteristics	8.3.1.5.2	
1.2.3.6.2.2.1 Quaternary regional hydrology	8.3.1.5.2.1	USGS
1.2.3.6.2.2.2 Future regional hydrology due to climate changes	8.3.1.5.2.2	USGS
1.2.3.7 RESOURCE POTENTIAL		
1.2.3.7.1 Human interference investigations	8.3.1.9	
1.2.3.7.1.1 Information on natural phenomena and human activities affecting surface-marker system	8.3.1.9.1	USGS, SNL
1.2.3.7.1.2 Present and future value of resources	8.3.1.9.2	
1.2.3.7.1.2.1 Natural resource assessment	8.3.1.9.2.1	USGS, LANL
1.2.3.7.1.2.2 Water resource assessment	8.3.1.9.2.2	T&MSS
1.2.3.7.1.3 Potential effects of exploiting natural resources	8.3.1.9.3	

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.3.7.1.3.1 Human intrusion studies	8.3.1.9.3.1	T&MSS
1.2.3.7.1.3.2 Evaluation of the potential effects of exploration or extraction of natural resources	8.3.1.9.3.2	T&MSS, USGS, LANL
1.2.3.8 DEFERRED SITE CLOSE-OUT		TBD
1.2.4 REPOSITORY		
1.2.4.1 MANAGEMENT AND INTEGRATION		SNL, T&MSS
1.2.4.2 DEVELOPMENT AND TESTING		
1.2.4.2.1 ROCK MECHANICS	8.3.1.15	
1.2.4.2.1.1 In Situ Thermal/Mechanical Tests	8.3.1.15.1	
1.2.4.2.1.1.1 Excavation investigations	8.3.1.15.1.5	SNL, F&S, H&N, REEC _o
1.2.4.2.1.1.2 In situ thermomechanical properties	8.3.1.15.1.6	SNL, F&S, H&N, REEC _o
1.2.4.2.1.1.3 In situ mechanical properties	8.3.1.15.1.7	SNL, F&S, H&N, REEC _o
1.2.4.2.1.1.4 In situ design verification	8.3.1.15.1.8	SNL, F&S, H&N, REEC _o
1.2.4.2.1.2 Rock Mass Analysis		
1.2.4.2.1.3 Rock Mechanics Field Testing		SNL, F&S, H&N, REEC _o
1.2.4.2.1.4 Data Records Management System		SNL
1.2.4.2.2 EQUIPMENT AND INSTRUMENT DEVELOPMENTS		
1.2.4.3 FACILITIES		
1.2.4.3.1 SITE PREPARATION		SNL
1.2.4.3.2 SURFACE FACILITIES		SNL
1.2.4.3.3 SHAFTS/RAMPS		SNL

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<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.4.3.4 SUBSURFACE EXCAVATIONS		SNL
1.2.4.3.5 UNDERGROUND SERVICE SYSTEMS		SNL
1.2.4.3.6 Design analysis and certification		SNL
1.2.4.3.6.1 Certification of design methods		SNL
1.2.4.3.6.2 Design Analysis		SNL
1.2.4.4 OPERATIONS/MAINTENANCE		SNL
1.2.4.5 DECOMMISSIONING		SNL
1.2.4.6 SEALING		SNL
1.2.4.7 Design Basis		
1.2.4.7.1 Design Requirements		SNL
1.2.4.7.2 Design Basis Analysis		SNL
1.2.5 REGULATORY AND INSTITUTIONAL		
1.2.5.1 MANAGEMENT AND INTEGRATION		USGS, SNL
1.2.5.2 LICENSING		
1.2.5.2.1 Regulatory Interactions		
1.2.5.2.1.1 Planning and Support		T&MSS, LANL, USGS LLNL, SNL,
1.2.5.2.1.2 Procedures		T&MSS
1.2.5.2.2 Site Characterization Plan		T&MSS, LANL, USGS LLNL, SNL
1.2.5.2.3 Nuclear Regulatory Review, Interpretation and Guidance		

.SHEET
Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.5.2.3.1 Reviews Interpretations, and Guidance		T&MSS, LANL, USGS, LLNL, SNL
1.2.5.2.3.2 Regulatory Training		T&MSS, LLNL, USGS, SNL, LLNL, F&S H&N, REEC _o
1.2.5.2.4 Licensing Support Documentation		T&MSS, LANL, LLNL, USGS, SNL
1.2.5.2.5 Study Plan Management and Review		T&MSS, LANL, USGS LLNL, SNL
1.2.5.2.6 SCP Progress Reports		LANL, USGS LLNL, SNL, T&MSS
1.2.5.2.7 Site Recommendation Report		T&MSS, LANL, LLNL, SNL, USGS
1.2.5.2.8 License Application		T&MSS, LANL, LLNL, SNL, USGS
1.2.5.3 ENVIRONMENTAL COMPLIANCE		
1.2.5.3.1 Environment Assessment		
1.2.5.3.2 Environmental Impact Statement		T&MSS, LANL, USGS LLNL, SNL
1.2.5.3.3 Environmental Regulatory Compliance		T&MSS
1.2.5.3.4 Environmental Monitoring and Mitigation Plan		T&MSS
1.2.5.3.5 Reclamation Plan		T&MSS
1.2.5.4 ENVIRONMENT		
1.2.5.4.1 Aesthetics		T&MSS
1.2.5.4.2 Air Quality/Meteorology	8.3.1.12.2	T&MSS
1.2.5.4.3 Archeological Resources		T&MSS, DRI

SHEET
Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.5.4.4 Noise		T&MSS
1.2.5.4.5 Radiological Studies		T&MSS, EPA
1.2.5.4.6 Soils		T&MSS
1.2.5.4.7 Terrestrial Ecosystems		EG&G
1.2.5.4.8 Water Resources		T&MSS
1.2.5.4.9 Land Use/Resource Lands		T&MSS
1.2.5.4.10 Native American Interactions		T&MSS
1.2.5.4.11 Environmental Field Work Coordination		T&MSS
1.2.5.5 TRANSPORTATION		
1.2.5.5.1 Transportation Studies		
1.2.5.5.1.1 Yucca Mountain Access Route Evaluation		T&MSS
1.2.5.5.1.2 Transportation Impact Studies		T&MSS
1.2.5.5.1.3 Engineering and Institutional Support		T&MSS, SNL
1.2.5.5.2 Impacts of offsite Installation Evaluation	8.3.1.13	T&MSS, SNL
1.2.5.6 SOCIOECONOMIC		
1.2.5.6.1 Socioeconomic studies		
1.2.5.6.1.1 Socioeconomic Program Plans		T&MSS
1.2.5.6.1.2 Socioeconomic Monitoring and Mitigation Plans and Progress Reports		T&MSS

WORKSHEET
Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.5.6.1.3 Socioeconomic Profiles		T&MSS
1.2.5.6.1.4 Topical Reports and Plans for EIS		T&MSS
1.2.5.6.1.5 Section 175 Socioeconomic Report		
1.2.5.6.2 Population density and distribution	8.3.1.10	T&MSS, EG&G
1.2.5.7 COMMUNICATION AND LIAISON		T&MSS
1.2.6 EXPLORATORY SHAFT FACILITY		
1.2.6.1 MANAGEMENT AND INTEGRATION		T&MSS, LANL, REECo, F&S, H&N
1.2.6.2 SITE PREPARATION		
1.2.6.2.1 Site and Roads	8.3.1	H&N, REECo
1.2.6.2.2 Surface Utilities and Communications Systems	8.3.1	H&N, REECo
1.2.6.3 SURFACE FACILITIES		
1.2.6.3.1 Buildings and Surface Facilities	8.3.1	H&N, REECo
1.2.6.3.2 ES-1 Shaft Collar	8.3.1	F&S, REECo
1.2.6.3.3 ES-2 Shaft Collar	8.3.1	F&S, REECo
1.2.6.4 FIRST SHAFT		
1.2.6.4.1 ES-1 Shaft and Liner	8.3.1	F&S, REECo
1.2.6.4.2 ES-1 Hoist and Headframe	8.3.1	F&S, REECo
1.2.6.5 SECOND SHAFT		
1.2.6.5.1 ES-2 Shaft and Liner	8.3.1	F&S, REECo
1.2.6.5.2 ES-2 Hoist and Headframe	8.3.1	F&S, REECo
1.2.6.6 SUBSURFACE EXCAVATIONS		
1.2.6.6.1 Main Test Levels		F&S, REECo
1.2.6.6.2 Exploratory Drifts		F&S, REECo
1.2.6.6.3 Secondary Levels		F&S, REECo

WORK SHEET
Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.6.7 UNDERGROUND SERVICE SYSTEMS		
1.2.6.7.1 Utilities, Services, and Communications	8.3.1	F&S, REEC _o
1.2.6.7.2 ES-1 Shaft Internals and Conveyances	8.3.1	F&S, REEC _o
1.2.6.7.3 ES-2 Shaft Internals and Conveyances	8.3.1	F&S, REEC _o
1.2.6.8 OPERATIONS		
1.2.6.8.1 Site and Equipment Maintenance	8.3.1	REEC _o
1.2.6.8.2 ESF Operation	8.3.1	REEC _o
1.2.6.8.3 Operational Environmental Health & Safety	8.3.1	REEC _o
1.2.6.8.4 Integrated Data Systems	8.3.1	LANL, H&N, F&S, REEC _o
1.2.6.9 DECOMMISSIONING		TBD
1.2.7 TEST FACILITIES		
1.2.7.1 MANAGEMENT AND INTEGRATION		T&MSS, F&S, H&N, REEC _o
1.2.7.2 TESTING		
1.2.7.2.1 Climax		LLNL, F&S, H&N, REEC _o
1.2.7.2.2 G-Tunnel		F&S, H&N, REEC _o
1.2.7.3 NEW FACILITY ACQUISITION		
1.2.8 LAND ACQUISITION		
1.2.8.1 MANAGEMENT AND INTEGRATION		T&MSS

WO. .EET
 Proposed WBS to match BCP-B-162

<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.8.2 SITE CHARACTERIZATION		T&MSS, BLM
1.2.8.3 REPOSITORY		T&MSS, BLM
1.2.8.3.1 Repository Site		T&MSS, BLM
1.2.8.3.2 Transportation Routes		T&MSS, BLM
1.2.9 PROJECT MANAGEMENT		
1.2.9.1 Management and Integration		
1.2.9.1.1 Management		T&MSS, LANL, F&S, USGS, H&N, LLNL REEC _o , SNL
1.2.9.1.2 Administrative Services		T&MSS, REEC _o , WSI, CSC, OSTI
1.2.9.1.3 Peer Reviews		T&MSS, LANL, F&S, USGS, H&N, LLNL REEC _o , H&N
1.2.9.1.4 Records Management		T&MSS, LANL, F&S, USGS, H&N, LLNL, REEC _o , SNL
1.2.9.2 PROJECT CONTROL		
1.2.9.3 QUALITY ASSURANCE		
1.2.9.3.1 Quality Assurance Program Development		T&MSS, LANL, F&S, USGS, H&N, LLNL, REEC _o , SNL
1.2.9.3.2 Quality Assurance Audits and Surveillances		T&MSS, LANL, F&S, USGS, H&N, REEC _o , SNL
1.2.9.3.3 Quality Assurance - Quality Engineering		T&MSS
1.2.9.3.4 Quality Assurance - Quality Overview		T&MSS, MacTec
1.2.9.3.5 Quality Assurance - Quality Control		T&MSS, F&S, H&N, REEC _o

WO. .EET
Proposed WBS to match BCP-B-162

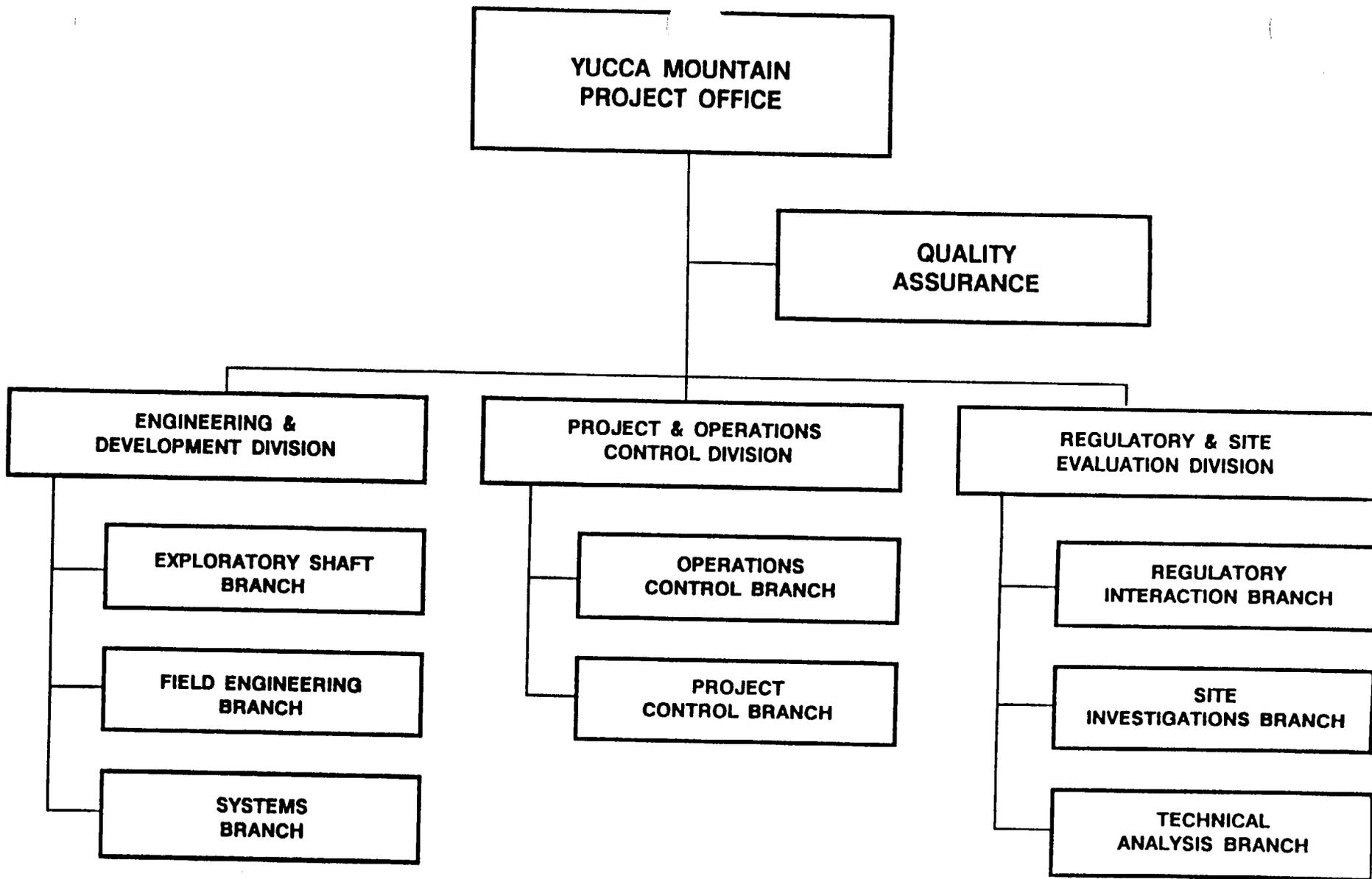
<u>WBS Element</u>	<u>SCP Section</u>	<u>Participants</u>
1.2.10 Financial/Technical Assistance		
1.2.10.1 State Grants		State of Nevada
1.2.10.2 Local Grants		State of Nevada
1.2.10.3 Grants-Equal-To-Taxes		State of Nevada
1.2.10.4 University Funding		State of Nevada

OCRWM/Yucca Mountain Project Meeting
For
Technical Data Management System

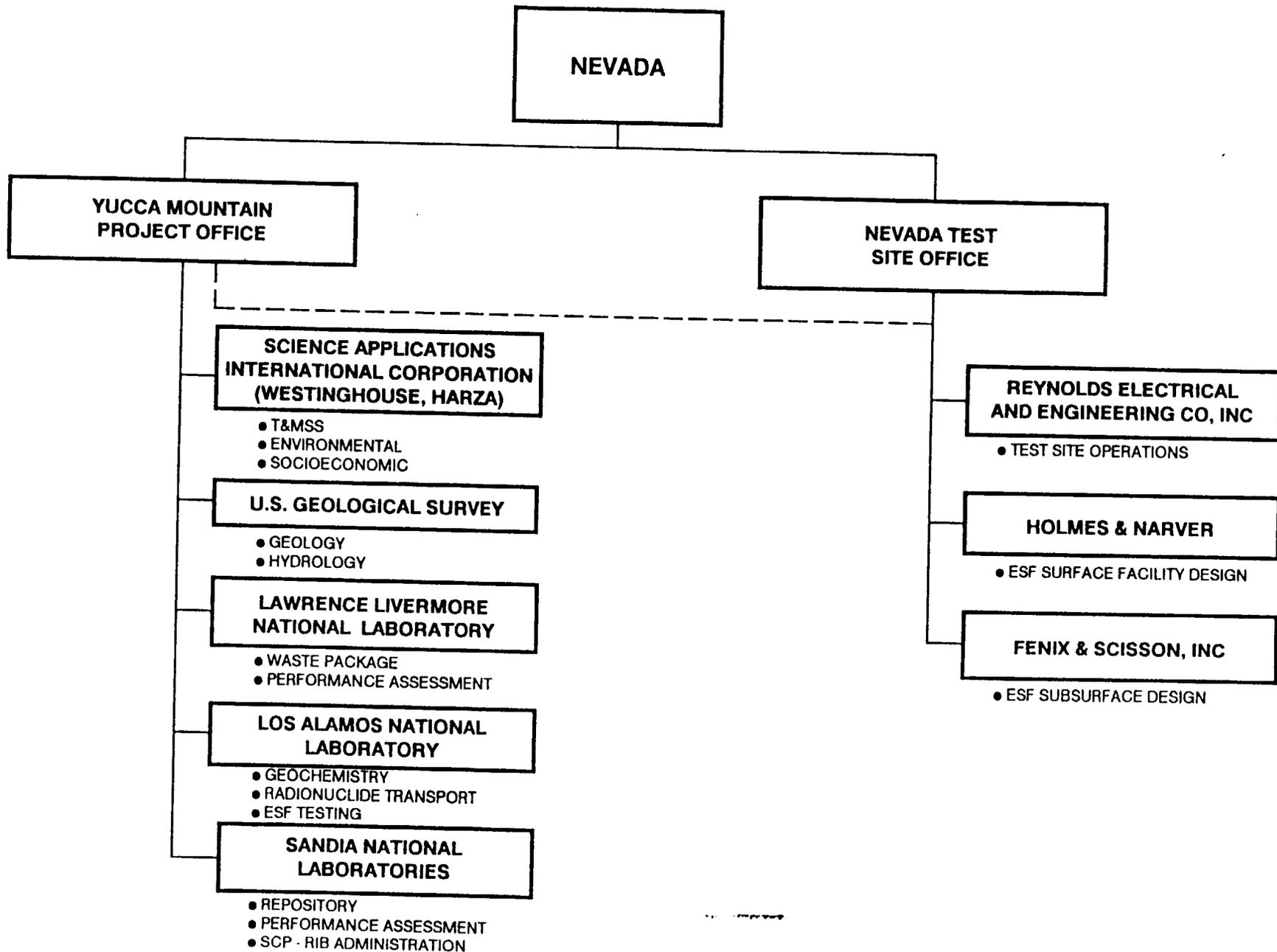
September 28, 1988
SAIC - Room 637, Las Vegas, Nevada

AGENDA

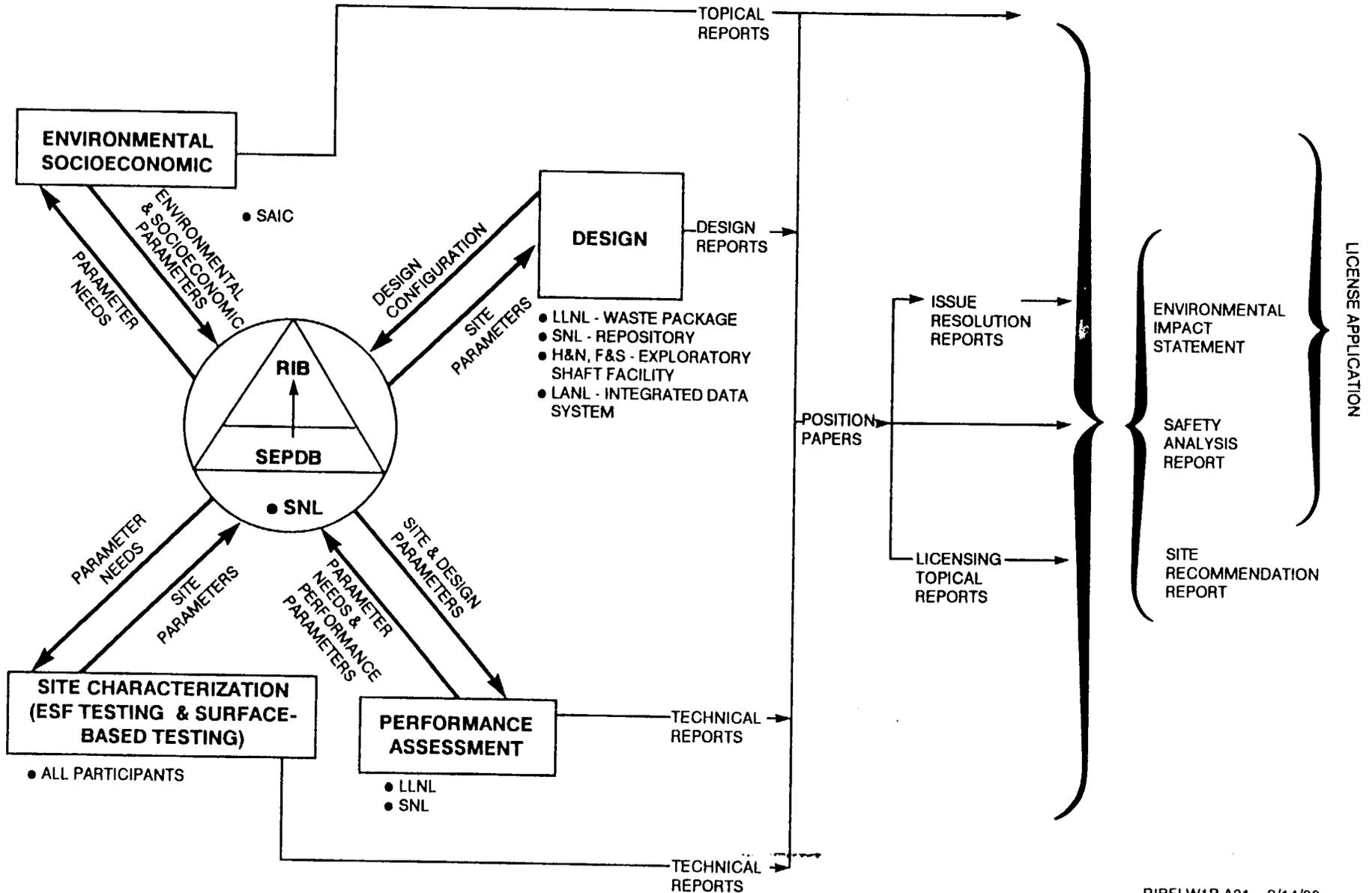
- 8:00 Introductions
- 8:10 OCRWM Concerns - Barbara Cerney
- 8:25 Project Office - Don Livingston
- 8:45 R.I.B. - Joe Schelling, SNL
10 minutes - Questions
- 9:45 S.E.P.D.B. - Chris Rautman, SNL
10 minutes - Questions
- 10:30 Break
- 10:45 SAIC Data Management - Gail Heitland, SAIC
10 minutes - Questions
- 11:10 LANL Data Management - Dick Herbst, LANL
10 minutes - Questions
- 11:30 LLNL Data Management - Don Livingston, YMP
10 minutes - Questions
- 12:00 Lunch
- 1:00 USGS Data Management - Bill Langer, USGS
10 minutes - Questions
- 1:30 SNL Data Management - Barry Schwartz, SNL
10 minutes - Questions
- 2:00 Summary or Wrap-up
- 2:30 Break
- 3:00 Workshop
Preparation of Draft
Response to NRC Letter



PROJECT INSTITUTIONAL ORGANIZATION

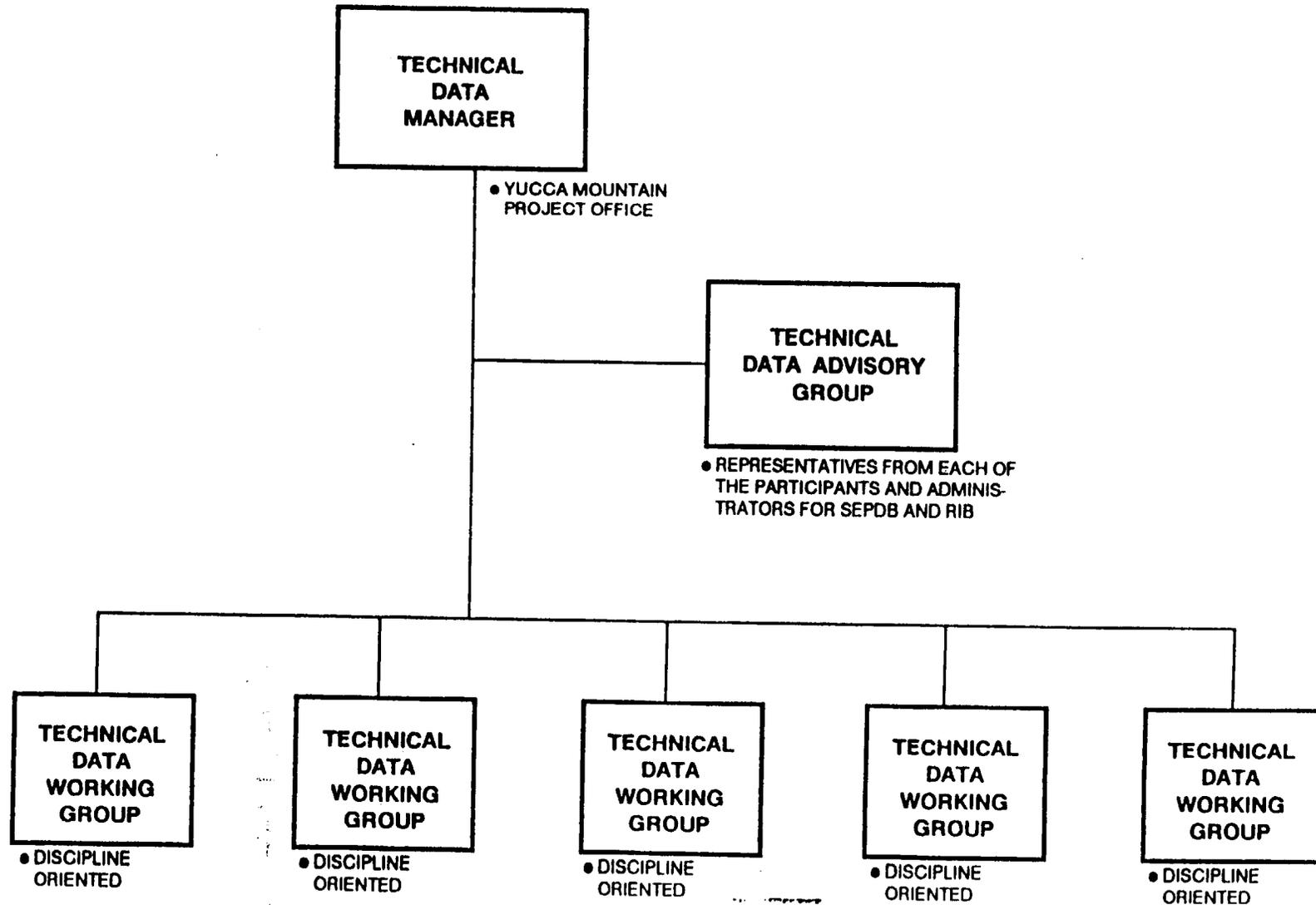


DATA INTERFACES WITH SEPDB AND RIB



TECHNICAL DATA MANAGEMENT SYSTEM

PROJECT MANAGER
REGULATORY & SITE EVALUATION DIVISION DIRECTOR
TECHNICAL ANALYSIS BRANCH CHIEF
TECHNICAL DATA MANAGER



YUCCA MOUNTAIN PROJECT TECHNICAL DATA MANAGEMENT PLAN

- SYSTEMS ENGINEERING MANAGEMENT PLAN
- CONFIGURATION MANAGEMENT PLAN
- YUCCA MOUNTAIN PROJECT QUALITY ASSURANCE PLAN

- MGDS REQUIREMENTS DOCUMENT
- SUBSYSTEMS REQUIREMENTS DOCUMENTS
- SITE CHARACTERIZATION PLAN

**PROJECT ADMINISTRATIVE
PROCEDURE 5.2Q FOR
THE SITE AND ENGINEERING
PROPERTIES DATA BASE (SEPDB)**

**PROJECT ADMINISTRATIVE
PROCEDURE 5.3Q FOR THE
REFERENCE INFORMATION
BASE (RIB)**

PROJECT LEVEL

PARTICIPANT LEVEL

**TECHNICAL
DATA
PROCEDURES**

**SEPDB
ADMINISTRATIVE
PROCEDURE
SNL**

**REFERENCE
INFORMATION
PROCEDURES**

**RIB
ADMINISTRATIVE
PROCEDURE
SNL**

**RECO
PROCEDURE**

**USGS
PROCEDURE**

**F & S
PROCEDURE**

**SNL
PROCEDURE**

**H & N
PROCEDURE**

**LLNL
PROCEDURE**

**LANL
PROCEDURE**

**SAIC
PROCEDURE**

**RECO
PROCEDURE**

**USGS
PROCEDURE**

**F & S
PROCEDURE**

**SNL
PROCEDURE**

**H & N
PROCEDURE**

**LLNL
PROCEDURE**

**LANL
PROCEDURE**

**SAIC
PROCEDURE**

BACKGROUND

1982: - NUCLEAR WASTE POLICY ACT (NWPA) AUTHORIZES THE SITING AND CONSTRUCTION OF THE NATION'S FIRST PERMANENT REPOSITORY FOR SPENT FUEL RODS AND HIGH-LEVEL NUCLEAR WASTE

- o DEPARTMENT OF ENERGY IS RESPONSIBLE FOR SITING, CONSTRUCTION AND OPERATION
- o NUCLEAR REGULATORY COMMISSION FOR LICENSING
- o NUCLEAR UTILITIES FOR PROVIDING FUNDING

1987: - AMENDMENT TO NWPA NAMED NEVADA AS THE STATE TO CONSIDER AS THE FIRST REPOSITORY SITE

A THREE YEAR LICENSE PROCEEDING IS MANDATED BY NWPA

A FEW FACTS ABOUT THE LICENSE APPLICATION

- AN ESTIMATED 25 MILLION PAGES OF PROGRAM DOCUMENTATION WILL BE GENERATED BY 1995; 40 MILLION BY 2003
- REVIEWERS AND INTERESTED PARTIES WILL BE LOCATED THROUGHOUT THE U.S.
- A GOOD PROPORTION OF LICENSE HEARING TIME IS CONSUMED WITH THE LEGAL DOCUMENT DISCOVERY PROCESS AND IN MOTIONS PRACTICE

HENCE A PROCESS WAS NEEDED TO SHORTEN DISCOVERY AND FACILITATE DOCUMENT TRANSMISSION

THE LSS CONCEPT

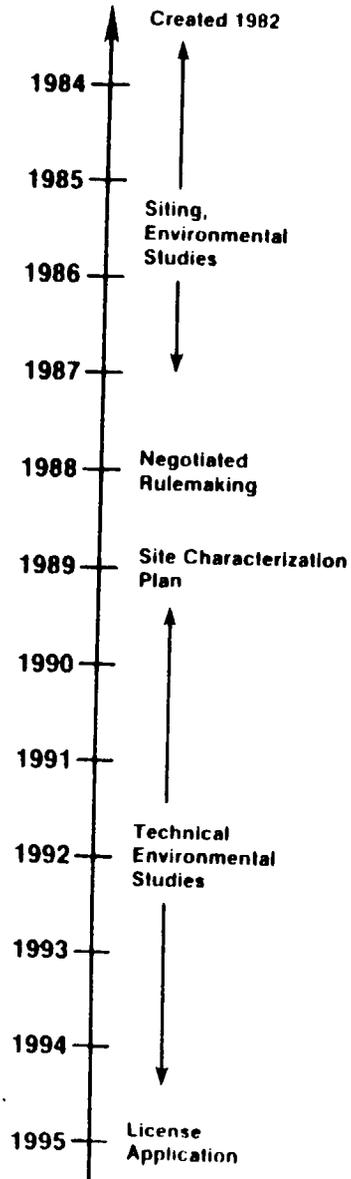
- A PANEL OF INTERESTED PARTIES WOULD MEET DURING 1987-1988 TO NEGOTIATE A RULE CONCERNING SUBMISSION OF DOCUMENTS AND PROCEDURES FOR THE USE OF THE LSS

ALL LICENSE RELATED DOCUMENTATION FROM DOE, NRC, AND THE PARTIES TO THE LICENSING HEARING WOULD BE ENTERED INTO A COMPUTER SYSTEM THAT WOULD SERVE AS THE SOLE BASIS OF DOCUMENT DISCOVERY

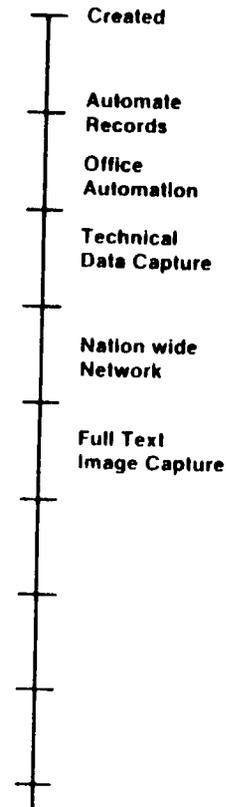
- NRC WOULD MODIFY ITS RULES OF PROCEEDING FOR A LICENSE HEARING TO INCORPORATE THE USE OF THE LSS
- ALL PARTIES WOULD AGREE TO A SPECIFIED DISCOVERY PERIOD WITHIN THE 3-YEAR HEARING PROCESS IN EXCHANGE FOR ACCESS TO THE LSS BEFORE AND DURING THE HEARING

LSS ORGANIZATIONAL CONTEXT

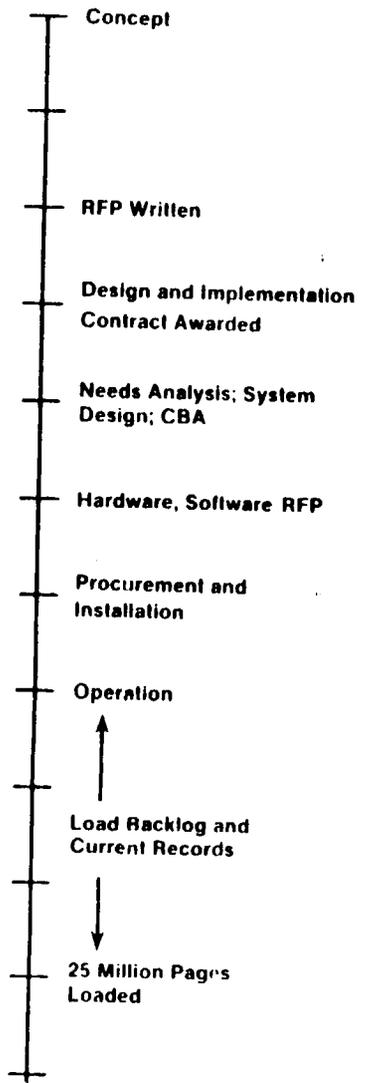
Office of Civilian Radioactive Waste Management



OCRWM Information Resource Management Organization



LSS



**IRM DIVISION
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

THE INFORMATION RESOURCES MANAGEMENT (IRM) DIVISION WAS CHARTERED TO ESTABLISHED AND IMPLEMENT THE INFORMATION INFRASTRUCTURE TO SUPPORT THE PROGRAMMATIC ACTIVITIES MANDATED BY THE NUCLEAR WASTE POLICY ACT.

CHARTER

- o MANAGE THE DEVELOPMENT, ACQUISITION, AND IMPLEMENTATION OF OCRWM HQ AND PROGRAM INFORMATION SYSTEMS.**
- o MANAGE THE ANALYSIS, PLANNING, AND ALLOCATION OF RESOURCES REQUIRED TO SUPPORT OCRWM INFORMATION SYSTEMS.**
- o PERFORM THE DATA BASE ADMINISTRATION OVERSIGHT.**
- o DEVELOP AND MANAGE PROGRAM-WIDE STANDARDS, PROCEDURES, SYSTEM SPECIFICATIONS, AND DOCUMENTATION.**
- o OVERSEE AND MANAGE PROGRAM-WIDE INFORMATION SYSTEM QUALITY ASSURANCE ACTIVITIES TO ENSURE UNIFORM QUALITY AND SECURITY AND INFORMATION SYSTEMS.**

IRM ELEMENTS

PROGRAM
MANAGEMENT &
INTEGRATION

- o PLANNING
- o BUDGETING
- o CONFIGURATION
MANAGEMENT &
CONTROL
- o QUALITY
ASSURANCE
- o TRAINING

INFORMATION
SYSTEMS

- o RECORDS
MANAGEMENT
SYSTEM
- o TECHNICAL
ENGINEERING
DATA SYSTEM
- o PROGRAM
MANAGEMENT
INFORMATION
SYSTEMS
- o ADMINISTRATIVE
SYSTEMS

EQUIPMENT
AND
TECHNOLOGY

- o ADP
- o OFFICE
AUTOMATION
- o MICROGRAPHICS
- o OPTICAL DISK

SOFTWARE

- o RDBMS
- o TEXT
MANAGEMENT
- o APPLICATION
PROGRAMS

TELECOMMUNICATIONS

- o LAN
- o WAN

INFORMATION SYSTEMS (IS)

RECORDS
MANAGEMENT
SYSTEM

- o RECORD INFORMATION SYSTEM (ARS/LSS)
- o ACTION ITEM TRACKING
- o DOCUMENT CONTROL SYSTEM
- o TRANSPORTATION LEGISLATION DATABASE
- o CONGRESSIONAL QUESTIONS & ANSWERS DATABASE

TECHNICAL
ENGINEERING
DATA SYSTEM

- o REFERENCE INFORMATION BASE
- o TECHNICAL DATA BASE
- o SAMPLE INVENTORY MANAGEMENT SYSTEM
- o PERFORMANCE ASSESSMENT SYSTEMS

PROGRAM
MANAGEMENT
INFORMATION
SYSTEM

- o PROGRAM MANAGEMENT SYSTEM
- o DELIVERABLES TRACKING SYSTEM
- o BUDGET DATA ENTRY SYSTEM

ADMINISTRATIVE
SYSTEMS

- o ISSUES TRACKING SYSTEM
- o COMMITMENT TRACKING SYSTEM
- o DOCUMENT REVIEW TRACKING SYSTEM
- o COMMENT RESPONSE TRACKING SYSTEM
- o PROPERTY INVENTORY CONTROL SYSTEM

DEFINITION OF THE LSS

- A SET OF PROCEDURES FOR GUARANTEEING ACCESS TO ALL INFORMATION RELEVANT TO A SET OF FACTUAL ISSUES REGARDING THE PROPOSED REPOSITORY
- THE MEANS EMPLOYED TO IMPLEMENT THE PROCEDURES



TOTAL INTEGRATION INTO ORGANIZATIONAL STRUCTURE

INFORMATION ENGINEERING OF THE LSS

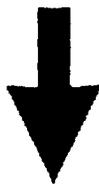
NEEDS ANALYSIS

- NEGOTIATED RULEMAKING
- SURVEY OF USERS
- PROTOTYPE

DATA SCOPE ANALYSIS

CONCEPTUAL SYSTEM DESIGN

COST-BENEFIT ANALYSIS



FUNCTIONAL DESCRIPTION OF REQUIREMENTS WHICH DICTATE THE SOLICITATION AND RESPONSE

INFORMATION ENGINEERING OF THE LSS

NEEDS ANALYSIS

- **NEGOTIATED RULEMAKING**

- SURVEY OF USERS

- PROTOTYPE

DATA SCOPE ANALYSIS

CONCEPTUAL SYSTEM DESIGN

COST-BENEFIT ANALYSIS

RULEMAKING ISSUES

- WHAT DOCUMENTS MUST BE IN THE LSS?
- WHAT SUBSET MUST BE IN FULL TEXT AND WHEN MUST THIS BE COMPLETED?
- HOW WILL PRIVILEGED MATERIAL BE HANDLED?
- HOW WILL DRAFTS, HANDWRITTEN MATERIAL AND MARGINALIA BE HANDLED?
- WHAT ARE THE MECHANICS AND RESPONSIBILITY FOR RECORD ENTRY?
- WHAT ARE PROCEDURES GOVERNING ACCESS TO THE LSS: WHO, HOW, AND AT WHAT COST?
- WHAT PROCEDURES ARE REQUIRED FOR DISPUTE RESOLUTION OVER DOCUMENT SUBMISSION OR LSS USAGE?
- WHO WILL HAVE ADMINISTRATION AND OVERSIGHT OVER THE LSS?

INFORMATION ENGINEERING OF THE LSS

NEEDS ANALYSIS

- NEGOTIATED RULEMAKING

- **SURVEY OF USERS**

- PROTOTYPE

DATA SCOPE ANALYSIS

CONCEPTUAL SYSTEM DESIGN

COST-BENEFIT ANALYSIS

USER SURVEY

USAGE PATTERN CATEGORIES

- TECHNICAL AND ENGINEERING 45%
- ~~REGULATORY~~ REGULATORY AND LICENSING 25%
- MANAGEMENT AND ADMINISTRATIVE 5%
- PUBLIC INFORMATION AND GENERAL PUBLIC USAGE 5%
- INTERMEDIARY 18%
- DATA BASE MANAGEMENT AND QUALITY ASSURANCE 2%

TOTAL INSTALLED WORKSTATIONS 350 ± 125

USER SEARCH & RETRIEVAL ACTIVITIES

HEADER SEARCHES:	SEARCHES ON THE HEADER OR CATALOG DESCRIPTIONS OF DOCUMENTS AND NON-DOCUMENT MATERIAL
RETURN NUMBER OF HITS:	THE RESULTS DISPLAYED ARE ONLY A REPORT OF THE NUMBER OF INSTANCES THE SEARCH CRITERIA WERE MET AND OF THE NUMBER OF DOCUMENTS IN WHICH HITS WERE FOUND
RETURN HEADER:	THE USER CHOOSES TO HAVE HEADER DATA DISPLAYED (AS OPPOSED TO A REPORT OF THE NUMBER OF HITS OR TO SEEING THE DOCUMENT TEXT)
RETURN TEXT:	THE USER ASKS TO SEE THE TEXT OF THE DOCUMENT, RATHER THAN JUST THE HEADER DATA
IMAGE BROWSING:	THE USER ASKS TO SEE PAGE IMAGES OF THE DOCUMENT, IN ADDITION TO THE DOCUMENT TEXT
FULL TEXT BROWSING:	THE UNIVERSE IN WHICH SEARCHES ARE PERFORMED INCLUDES THE FULL TEXT OF DOCUMENTS, RATHER THAN JUST THE HEADER OR CATALOG DATA
LOCAL PRINT REQUESTS:	REQUESTS TO HAVE MATERIAL PRINTED AT THE LOCAL SITE
PRINTED PAGE IMAGES:	PRINTING IMAGE VERSIONS OF DOCUMENT PAGES
PRINT HEADER INFORMATION:	PRINTING HEADER OR CATALOG DATA
E-MAIL MESSAGES:	ELECTRONIC MAIL MESSAGES SENT DURING THE SESSION

SYSTEMS PERFORMANCE REQUIREMENTS

USER SESSION CHARACTERISTICS

- LENGTH, NUMBER, PEAK, AVERAGE

USER GEOGRAPHIC DISTRIBUTION

- TOTAL NUMBER, SIMULTANEOUS USERS, WHERE LOCATED

RESPONSE TIME CHARACTERISTICS

- DURING INDEXED SEARCH, FULL TEXT SEARCH, PAGING
- TO RECEIVE DOCUMENTS (>100 PAGES, <100 PAGES), HEADER DATA

OUTPUT CAPABILITIES

- TO TERMINAL, HARDCOPY, DOWNLOADING

OTHER FEATURES

- ELECTRONIC MAIL, ANNOTATE TEXT

INFORMATION ENGINEERING OF THE LSS

NEEDS ANALYSIS

- NEGOTIATED RULEMAKING
- SURVEY OF USERS
- PROTOTYPE

DATA SCOPE ANALYSIS

CONCEPTUAL SYSTEM DESIGN

COST-BENEFIT ANALYSIS

DATA SCOPE ANALYSIS

LSS DOCUMENT CATEGORIES & SIZE IDENTIFIED THROUGH EXAMINATION OF
LEGAL, REGULATORY, AND PROGRAM PLANNING DOCUMENTS

- NWPA
- REGULATIONS
- RULEMAKING SUBJECT CATEGORIES
- MISSION PLAN DETAILING SCIENTIFIC, ENVIRONMENTAL, SAFETY ISSUES

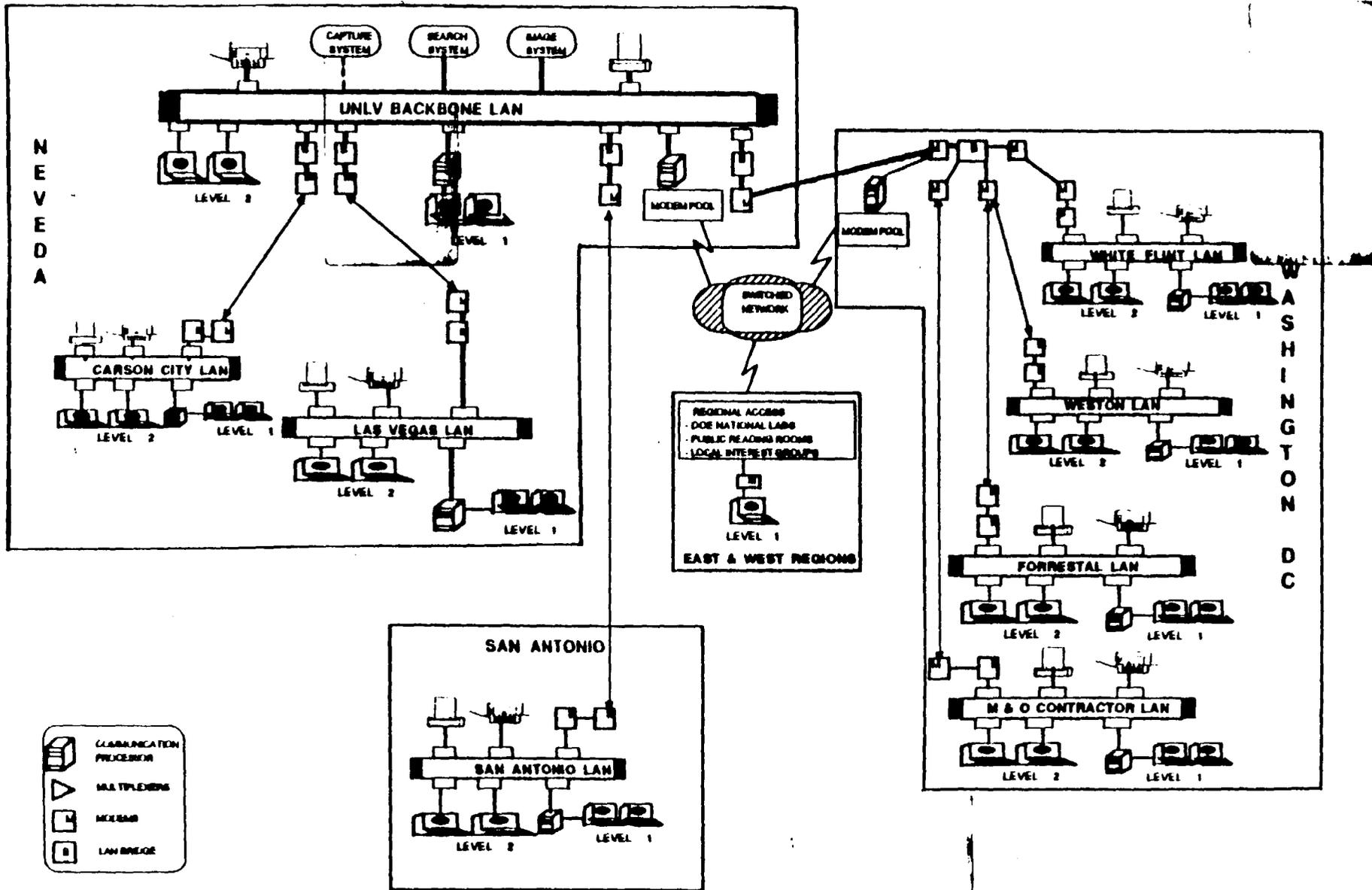
<u>YEAR</u>		<u>TOTAL SIZE</u>
1990	-	12,000,000 PAGES
1995	-	22,000,000 PAGES
1998	-	28,000,000 PAGES
2009	-	42,000,000 PAGES

STORAGE REQUIREMENTS (GIGABYTES)

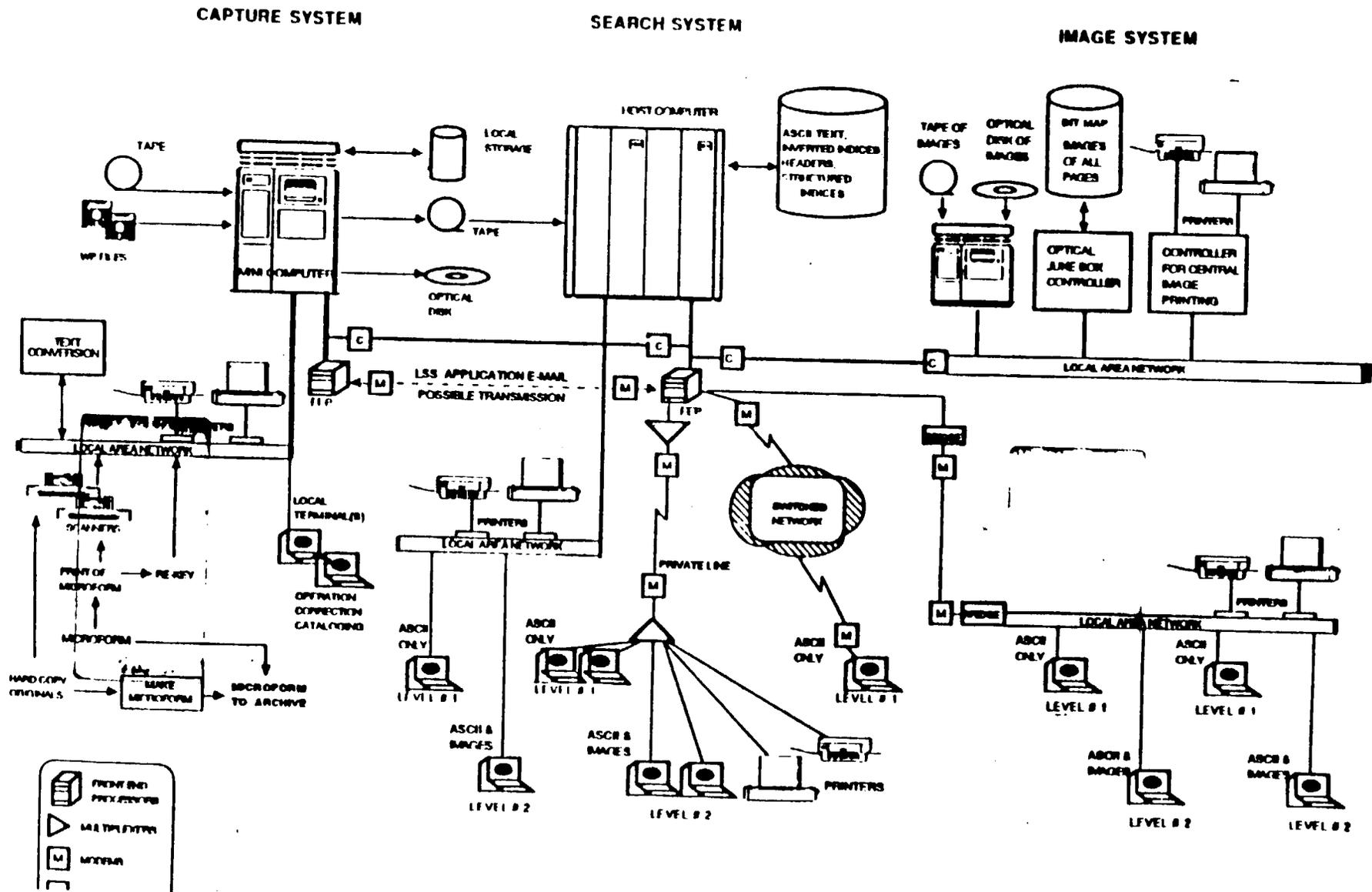
BASED ON DOCUMENTS COUNTS IN DATA SCOPE ANALYSIS

<u>YEAR</u>	<u>BIBLIOGRAPHIC DATA/INDICES</u>	<u>ASCII TEXT/INDICES</u>	<u>BIT-MAPPED IMAGES</u>
1990	2-5	17-32	170-260
1994	6-18	54-126	540-1,000
1998	8-25	74-175	750-1,400

LSS TOPOLOGICAL COMMUNICATION NETWORK ARCHITECTURE



BASE CONCEPTUAL DESIGN HARDWARE ARCHITECTURE



INFORMATION ENGINEERING OF THE LSS

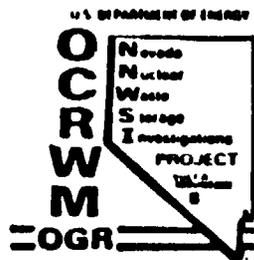
NEEDS ANALYSIS

- NEGOTIATED RULEMAKING
- SURVEY OF USERS
- PROTOTYPE

DATA SCOPE ANALYSIS

CONCEPTUAL SYSTEM DESIGN

COST-BENEFIT ANALYSIS

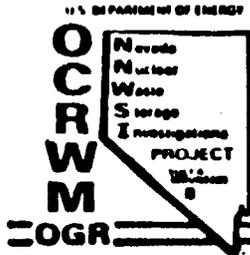


YUCCA MOUNTAIN PROJECT TECHNICAL DATA MANAGEMENT



Three Data Management Levels for the Project:

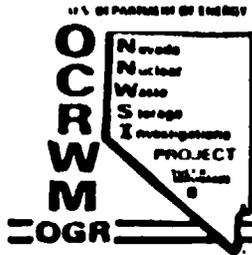
- Reference Information Base (RIB)--Identifies Project baselined technical data and information; administered by SNL.
- Technical Data Base (TDB: SEPDB and IGIS)--Central Project data base of site characteristics data; administered by SNL.
- Local Records Centers (LRCs)--Participant-level processing of local technical (and other) records. (At SNL, the Data Records Management System (DRMS) is a separate component of the LRC that processes technical data records.)



YUCCA MOUNTAIN PROJECT REFERENCE INFORMATION BASE



- The central, Project source of up-to-date reference technical information.
- Included in the Project technical baseline and subject to baseline control.
- The information provided in the RIB is distilled from fully-interpreted technical data and summarizes the current state of Project development.
- Continuous evolution through license application, with changes communicated through periodic updates.
- User-driven; user-identified needs are coordinated with data-producing activities to define RIB content.

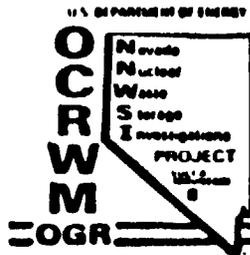


Baselining and the RIB



- Processing of information into the baselined RIB establishes the validity and traceability of information, evaluates change impacts, and acquires Project approval.
- Baseline-controlled information provides a point of contact for ensuring interface compatibility and improves the consistency of information usage.
- ★ ■ Baselined information that is selected for use in licensing will be identified by the RIB.
- Periodic updates allow the RIB to reflect current Project technical information status and to rapidly communicate baseline changes.

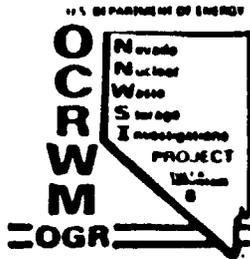
3 mos
or
6 mos



Intended Uses of the RIB



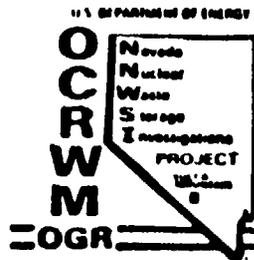
- **Coordinates reference information identification, transfer, and feedback between site characterization, design development, and performance assessment activities.**
 - a source of information for use in Project activities.
 - a summary of output generated by Project activities.
- **Provides pointers to sources of more detailed data (e.g., SEPDB, reference drawings, sensitive information.)**
- **Identifies up-to-date reference information status to users external to the Project. (External users require Project Manager approval for inclusion on controlled distribution.)**
- **The RIB has a long-term objective of identifying the technical basis for the license application.**



RIB History



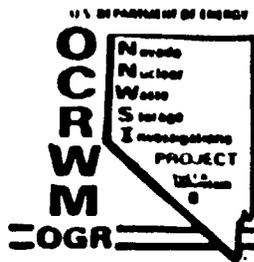
- **Version 01.001 (5/86) - Preliminary draft example of format and typical content.**
- **Version 02.001 (5/87), 02.002 (8/87) - Expanded draft example of format, structure, and change control; content primarily from SCP-CDR.**
- **Version 03.001 (1/88) - Baselined ESF prerequisite; content essentially taken intact from selected fraction of draft version 02.002.**



Current RIB Development Status



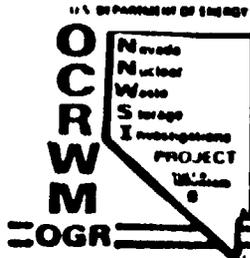
- Effort underway to evaluate and replace contents of 03.001 with information certified as appropriate, up-to-date, and with improved source documentation.
- Concurrent effort to respond to requests for additional new information and to migrate draft contents into baseline version.
- Update revision to be coordinated with Project technical baseline and document change control.



RIB Organization



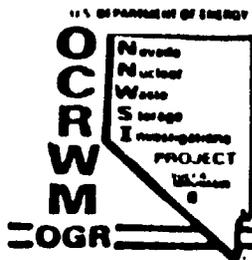
-
- **Three general divisions (Chapters): Site Characteristics, Design Configuration, Performance Assessment Results.**
 - **Each Chapter is subdivided into Sections, which are loosely based on the Issues Hierarchy and organization of other comprehensive Project documents.**
 - **Final level of subdivision into Information Items, the basic RIB entity, which contains related information for a specialized topic area.**



RIB Chapters and Sections



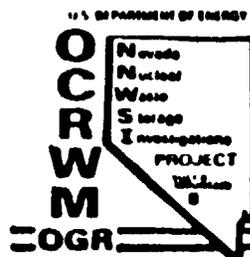
Site Characteristics	Design Configuration	Performance Assessment
Site Geology	Overall Facility	Postemplacement Conditions
Geophysics	Waste Package and Form	Waste Package and Retrievability
Geochemistry	Surface Facilities	Geohydrologic Analysis
Geohydrology	Shafts and Ramps	Environmental Impacts
Environmental Conditions	Underground Facilities	Other Impacts
Socioeconomic Conditions	Costs	Performance Confirmation
	Schedules	



RIB Organization



- **Distributed in loose-leaf format to facilitate revision.**
- **Information Items are numbered and entered chronologically upon approval as a baseline change.**
- **Topic Index used as primary means of locating information.**
- **Change-controlled introductory and indicial pages.**
- **New base version released at initiation of major Project phases or as needed.**
- **Information Item change control identifiers include revision number, release date, and a control number, which points to a file of supporting information.**



RIB Information Item Content



- **Header Block - Identifiers and change control**
- **Description & Methodology - Summary description, origin, intended uses, limitations, implicit assumptions, quality assurance.**
- **Sources - Published and unpublished cited sources (copies of the latter are archived with change control documentation).**
- **Reference Information - Tabular and graphic format as appropriate.**

CHAPTER	SITE CHARACTERISTICS		YUCCA MOUNTAIN PROJECT REFERENCE INFORMATION BASE			
SECTION	GEOPHYSICS					
ITEM	GEOTHERMAL GRADIENT		CHAPTER	SECTION	ITEM	PAGE
			1	2	3	1 of 2
			VERSION	REVISION	RELEASE DATE	RIB CONTROL NUMBER
			3	B	8/18/88	CD8-A

Keywords: geothermal gradient, representative borehole temperature

Description & Methodology

The accompanying figure shows a representative temperature versus depth profile for borehole USW G-4, which is the proposed site of the exploratory shaft. The figure was selected from a study involving repeated temperature logs obtained in 18 geologic test wells near Yucca Mountain (Sass et al., 1988). The temperature data suggest that the thermal regime of both the saturated and unsaturated zones near Yucca Mountain is strongly influenced by vertical and lateral water flow. Of the series of four temperature logs for USW G-4 (March 1983, October 1983, March 1984, and June 1984), the June 1984 profile given in the figure is assumed to be generally representative of the temperature profile at the exploratory shaft location.

For the unsaturated zone, which is above the water table and is indicated by the break in the curve near 541 m, the geothermal gradient (i.e., the change in temperature with change in depth) increases from about 18°C km⁻¹ between 150 m and 400 m below the surface to about 30°C km⁻¹ between depths of 400 m and 530 m (Sass et al., 1988). The approximately linear temperature profile in the unsaturated zone is evidence for conductive heat flow.

In the saturated zone (below the water table), the geothermal gradient is irregular with evidence for locally controlled water movement in the Tertiary volcanic rock. Below the water table, the temperature profile becomes nonlinear, which is evidence for nonconductive heat flow. Temperature measurements were made at discrete depths in boreholes by using the well-logging mode of operation (Sass et al., 1971). The temperature measurement system consisted of a thermistor probe with a time constant of approximately 2 sec in still water, a probe depth-measuring component with a level of accuracy of better than 0.2% of depth, and a resistance measuring component that determines the thermistor probe resistance. The procedures and standards used to obtain the temperature logs were equivalent to those discussed in the report by Sass et al. (1971). The thermistor probe, filled with silicone oil to facilitate thermal contact with the probe wall, logged continuously at 20 ft/min and sampled temperatures at 1- to 3-ft intervals. Resistance measurements were made with a digital multimeter, which connects to the thermistor probe through a cable and uses a four-wire measurement system (two constant current leads and two sense leads). Digital multimeters used in the field tests were calibrated every six months against a Leeds and Northrup 4756 decade box, which is traceable to the National Bureau of Standards.

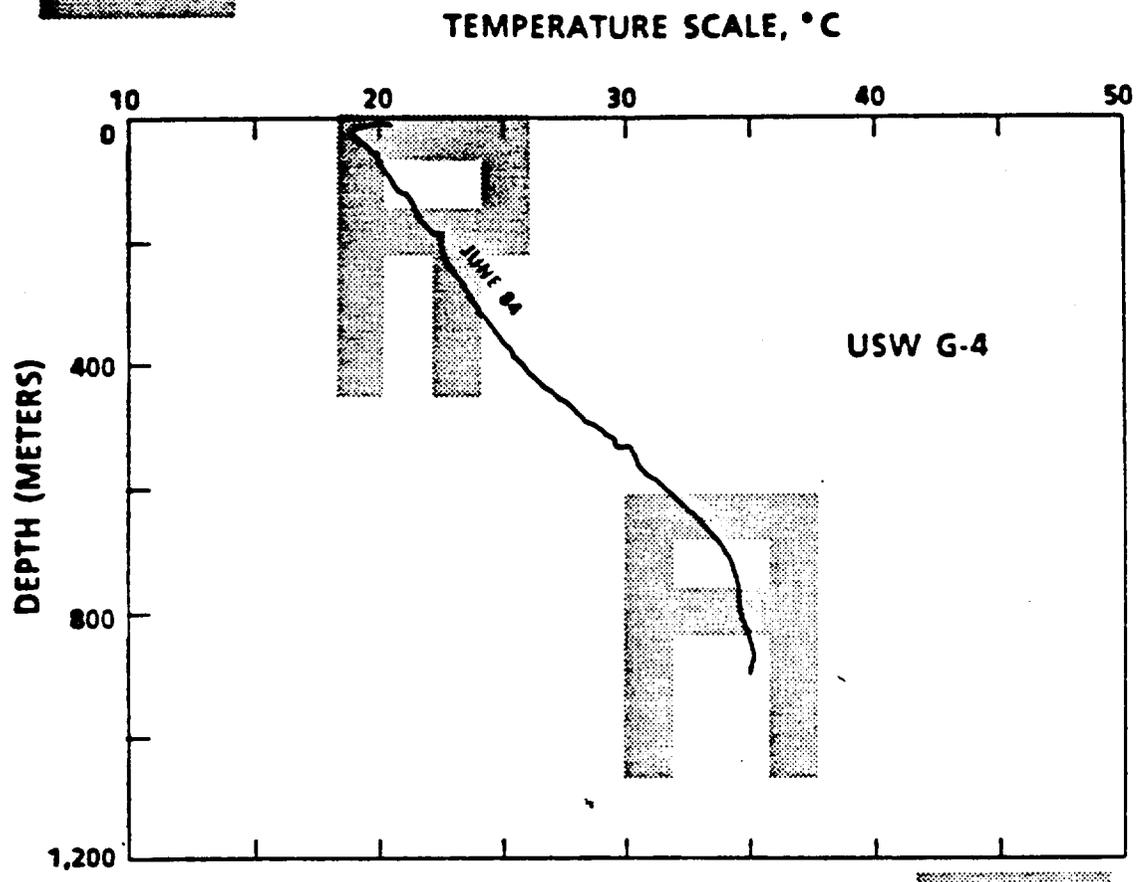
Borehole temperature data presented in the report (Sass et al., 1988) were collected and interpreted as part of the activity for WBS Element 1.2.3.2.2.4. Although conducted under quality assurance procedures, this work was done before quality assurance levels were approved for and assigned to the activities or procedures. Until the data can be qualified, caution should be taken in their use in NNWSI Project activities.

Sources

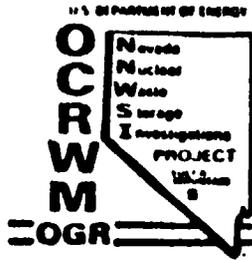
Sass, J. H., A. H. Lachenbruch, R. J. Munroe, G. W. Greene, and T. H. Moses, Jr., September 10, 1971. "Heat Flow in the Western United States," *Journal of Geophysical Research*, Vol. 76, No. 26, pp. 6376-6413.

Sass, J. H., A. H. Lachenbruch, S. S. Priest, and R. J. Munroe, 1988 (draft). "Temperature, Thermal Conductivity, and Heat Flow Near Yucca Mountain, Nevada: Some Tectonic and Hydrologic Implications," U. S. Geological Survey.

CHAPTER SITE CHARACTERISTICS		YUCCA MOUNTAIN PROJECT REFERENCE INFORMATION BASE			
SECTION GEOPHYSICS		CHAPTER 1	SECTION 2	ITEM 3	PAGE 2 of 2
ITEM GEOHERMAL GRADIENT		VERSION 3	REVISION B	RELEASE DATE 8/18/88	RIB CONTROL NUMBER CD8-A



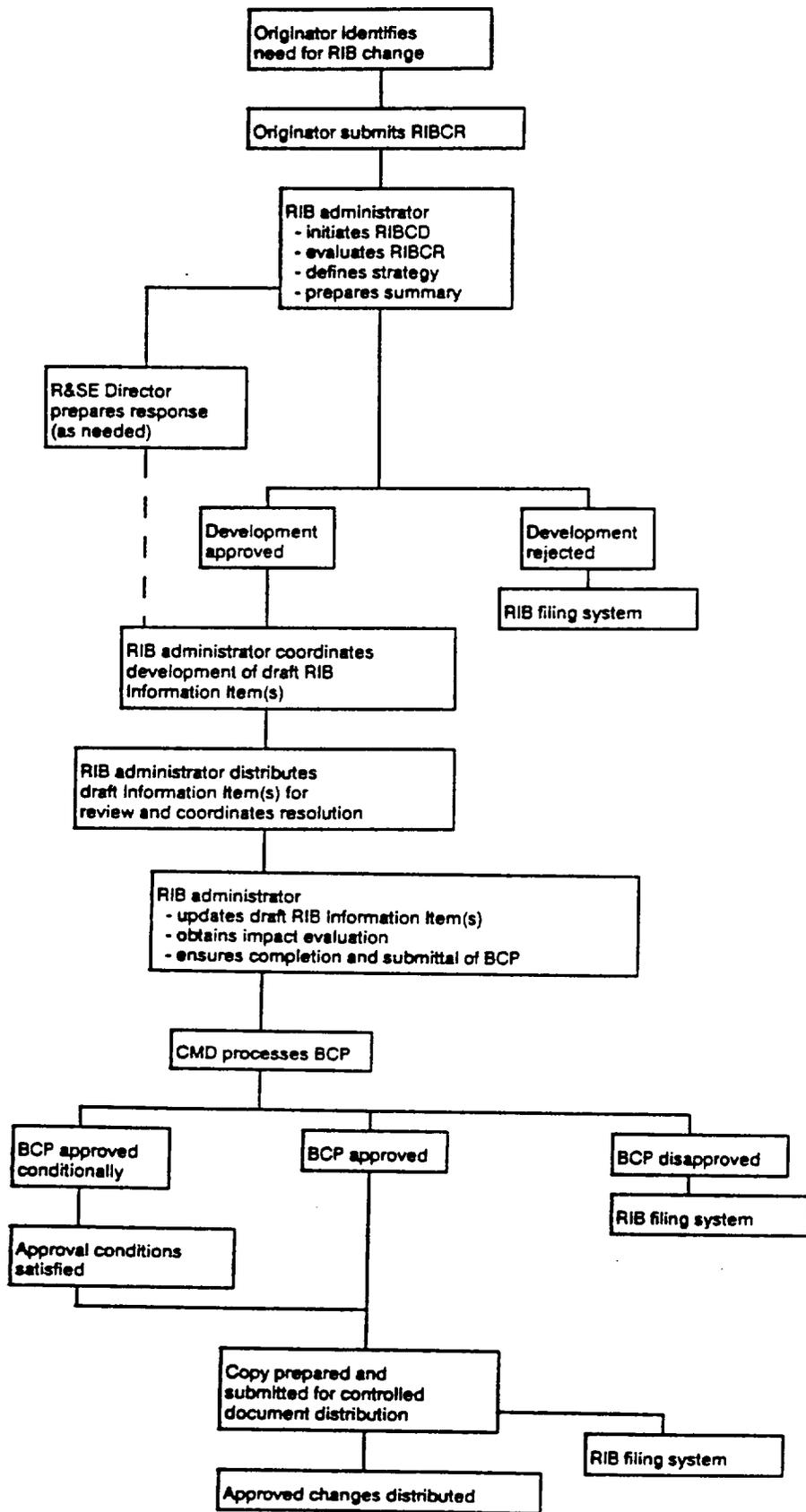
TEMPERATURE PROFILE FROM USW G-4

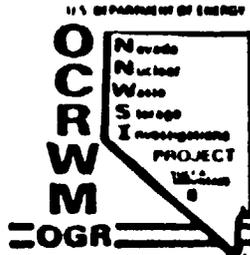


RIB Change Control



- In response to user-identified reference information needs, Information Items are prepared for submittal as Baseline Change Proposals for consideration by the appropriate Project Change Control Board.
- A record of the information item development and disposition process is filed in the SNL Local Records Center and submitted to the Project Records Management System.
- Approved baseline changes (Information Items and associated index pages) are distributed through the Project's controlled document distribution system.

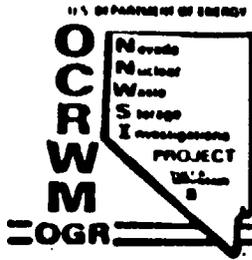




RIB Change Control



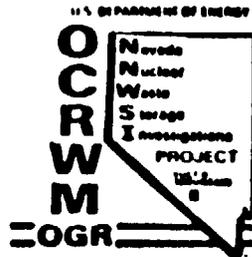
- **RIB Change Request - (RIBCR) -**
 - **Used to initiate consideration of proposed changes.**
 - **Submitted by user request or provider submittal.**
 - **Evaluated by RIB Administrator for further action as input filter and to identify development and review strategy.**



RIB Change Control (continued)



- **RIB Change Development Form - (RIBCD) -**
 - **Tracks and documents item development status.**
 - **Development process coordinated with users and providers.**
 - **Documents identification and resolution of technical concerns, and preparation of information items.**



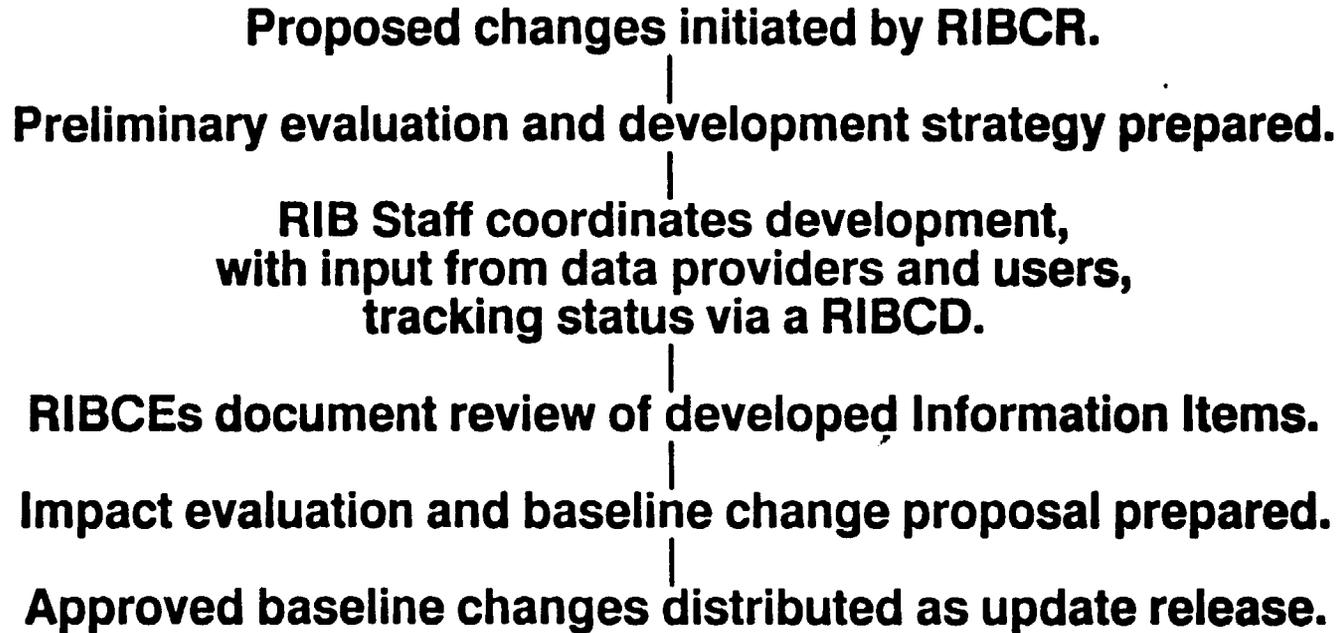
RIB Change Control (continued)



- RIB Change Evaluation - (RIBCE) - Documents review of completed information item for usefulness, adequacy and validity of descriptive material, and presentation format.
- Completed RIBCD file, including initiating RIBCR, RIBCD form, RIBCEs, and documentation of development process is submitted to Project technical baseline control and serves as archival change record.
- Approved changes released as subsequent update set to controlled RIB distribution.
- A change control status log, maintained by the RIB administrator, is used to prepare periodic Project reports.



RIB Change Control Summary



**YUCCA MOUNTAIN PROJECT
REFERENCE INFORMATION BASE
CHANGE DEVELOPMENT FORM**

RIB Control Number: _____ **Date RIBCD File Initiated:** _____

Subject: _____

Type of Action: Add Delete Replace Modify Other

Summary of Proposed Change: _____

RIB Administrator RIBCR Evaluation: _____

RIBCR Disposition and Development Strategy: _____

Draft Item Completed on: _____

Distributed for Review on: _____

Review Comments Received on: _____

Impact Evaluation: _____

BCP Submittal Date: _____

BCP No.: _____

BCP Return Date: _____

BCP Disposition: Approved Conditional Disapproved

Approval Conditions Satisfied: _____

Submitted for Distribution on: _____

RIBCD Filed on: _____

**YUCCA MOUNTAIN PROJECT
REFERENCE INFORMATION BASE
CHANGE EVALUATION FORM**

RIB Control Number: _____

Subject: _____

Date: _____

Reviewer: _____

Date Received by Reviewer: _____

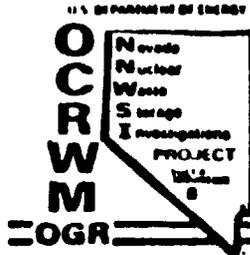
(Name, Organization, Phone)

Comments Required by: _____

Comments Received by RIB Administrator on: _____

No.	Loc./Type ¹	Reviewer's Comments	Response ²	Reason	DISPOSITION ³
REVIEWER'S COMMENTS			RESOLUTION		

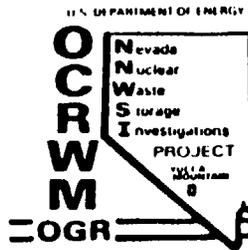
¹ Indicate type as (M)-major, (E)-editorial, or (S)-suggestion.
² Indicate acceptance or rejection



SUMMARY



- **The RIB is a dynamic, evolutionary document that identifies and summarizes Project-baselined reference technical information.**
- **The RIB is used by the Project to enhance the consistency of data usage and interface compatibility and to provide external parties with summaries of technical information status.**
- **The RIB change control process coordinates and documents the preparation of proposed changes to the baselined RIB.**
- **The baseline change control process verifies the adequacy of review, evaluate change impacts, and approves changes to the Project baseline.**



TECHNICAL DATA MANAGEMENT

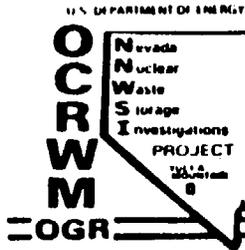


SITE & ENGINEERING PROPERTIES DATA BASE

(S E P D B)

Christopher A. Rautman
Division 6315
Sandia National Laboratories
Albuquerque, New Mexico

September 28, 1988

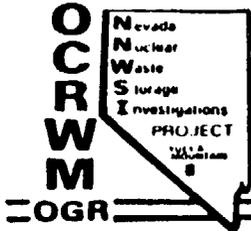


Site & Engineering Properties Data Base (SEPDB)

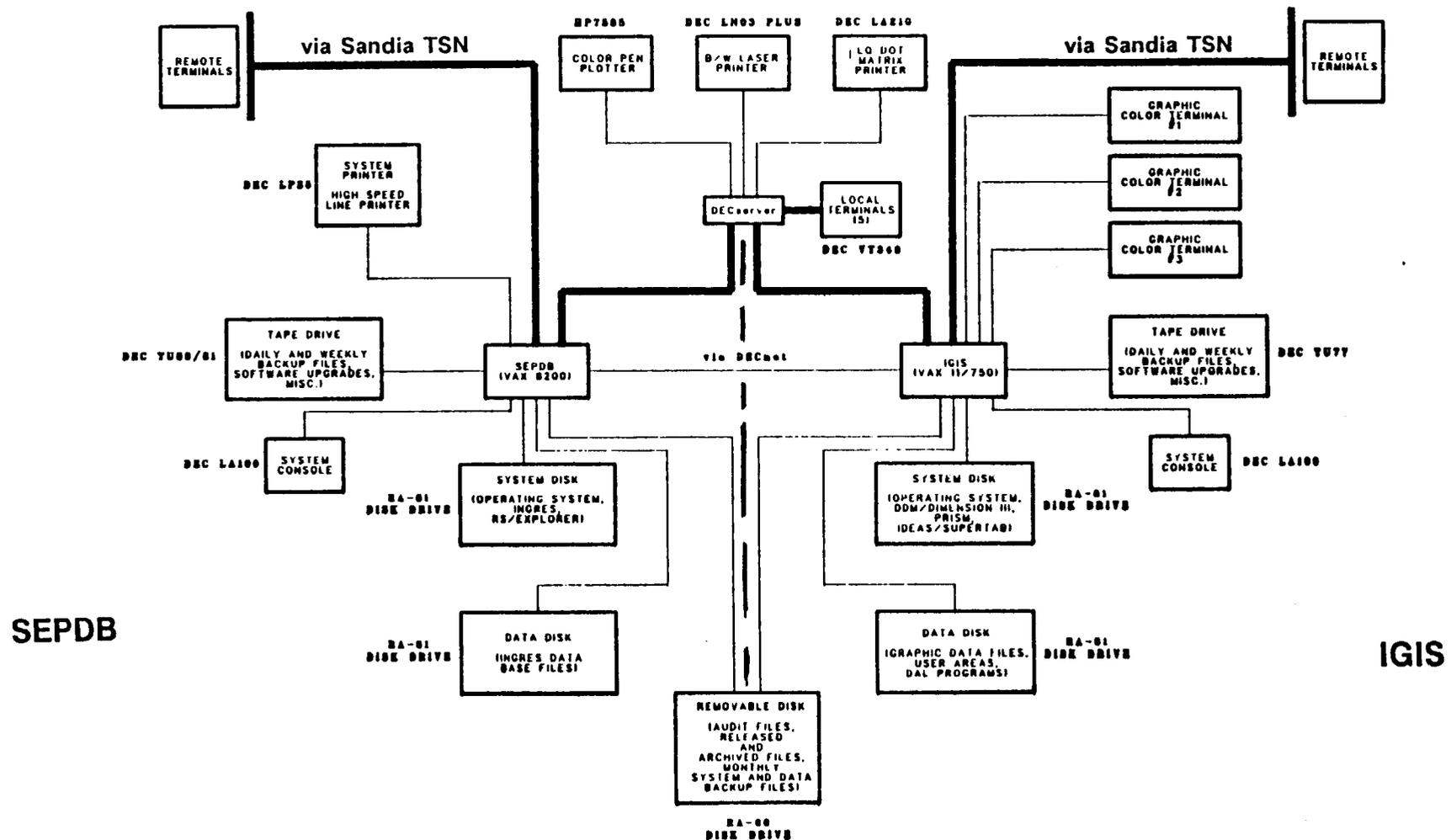
The SEPDB:

- is a relational data base
- is maintained on a dedicated VAX 8200 computer
- uses the Ingres data base management system

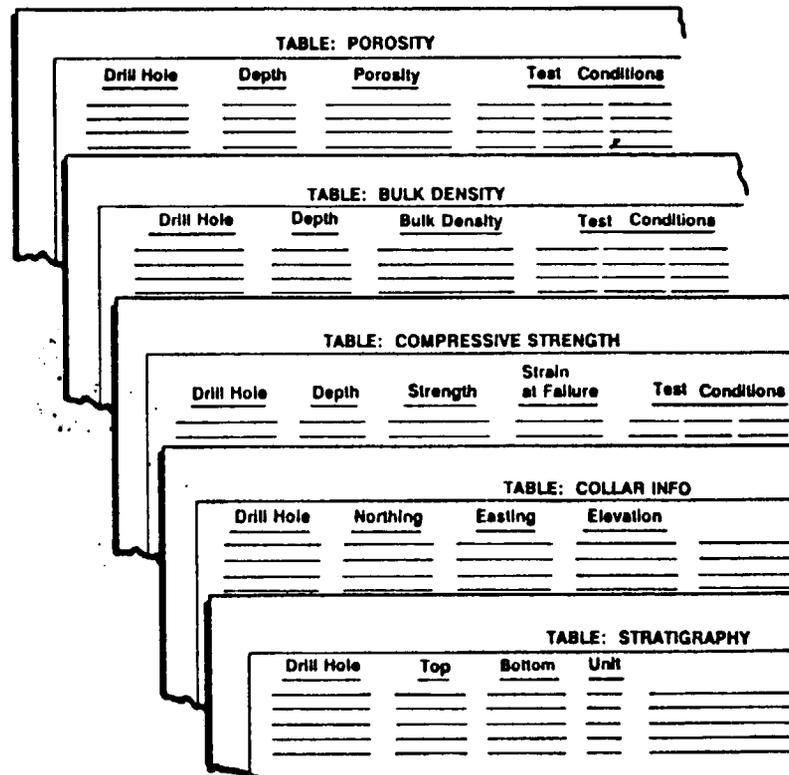
- is a service organization providing data retrievals
tailored to meet a particular need

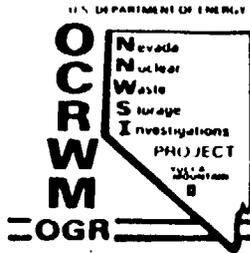


Technical Data Base Computer Hardware Configuration



A relational data base may be thought of as a collection of tables,
 each of which contains a "complete" set of information about
 a particular topic or parameter.





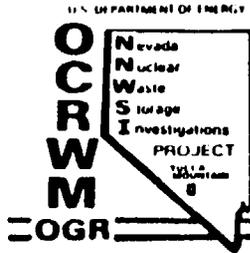
- ✦ The SEPDB is oriented primarily toward the storage of rock properties and other location-specific site information.

- ✦ The principal organizing structure of the SEPDB is "by drill hole and depth"

Types of Data Contained in the SEPDB

Rock Properties & Related Information

1. Bulk Density
2. Compressive Strength
3. Elastic Properties
 - Poissons Ratio
 - Youngs Modulus
4. Grain Density
5. Hydraulic Conductivity
6. Paleomagnetic Orientation
7. Pore Saturation
8. Pore Water Content
9. Porosity
10. Thermal Conductivity
11. Water Level Data
12. Water Chemistry Data
13. Well-Test Hydraulic Conductivity
14. Well-Test Transmissivity
15. Well-Test Storage Coefficients



Types of Data Contained in the SEPDB

Other "Parameters"

16. Core Recovery Data
17. Drill Hole/Sample Location
18. Geologic Stratigraphy

"Reference" Tables

19. Authors (of Reports)
20. Data Authorization Numbers
21. References (Citations)

Relationships among different tables

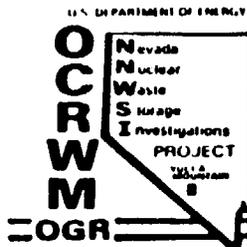
- are specified by matching contents of specific common key fields

- may be developed ad hoc through the on-line manipulation of tables using standard Ingres commands, or

- may be hard-coded through some form of "applications software"

There are four (4) major types of information stored for any parameter (the "85-percent" rule):

1. Location/Identification
2. The Parameter of Interest
3. Test Conditions/Qualifiers
4. QA Level and References

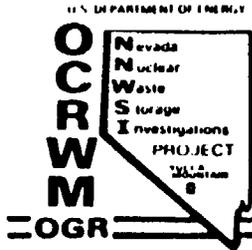


BULK DENSITY TABLE FIELDS AND DEFINITIONS

Table Name: **bdensity**

Data Base: **SEP01**

Column	Description, field size
Location and Identification Information	
hole_id	Drillhole name (or sample ID) for the data, text(15)
depth	Down-hole run location of the sample (0.0 if surface), (f4)
depth_unit	Unit of measure for depth (feet or meters), text(3)
sample_id	Sample identification number, text(15)
The Parameter(s)	
bdensity	Bulk Density value for the sample, (f4)
dens_unit	Unit of measure for bulk density data (g/cc,), text(6)
Test Conditions	
sat_state	Saturation state of sample during test, text(15)
test_no	Test number of multiple tests on the same sample, (i1)
test_type	Testing method used to determine parameter values, text(15)
test_temp	Sample temperature (and units) during test, text(10)
test_press	Sample pressure (and units) during test, text(10)
samp_leng	Sample length (and units of measure), text(10)
samp_diam	Sample diameter (and units of measure), text(10)
Reference Information	
qa_level	QA level of the data (I, II, III, NQ or TBD), text(3)
dan	Data authorization number for data submittal, text(8)
reffk	Number that points to reference document for data, (i2)
page_no	Page number for data in the reference document, text(6)
drms_id	Pointer to data records in participant's LRC, text(15)

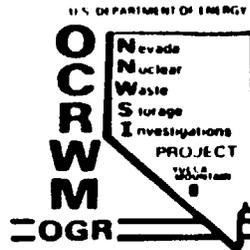


Quality Assurance:

- all data for the SEPDB must be authorized by the
originating participant's Technical Project Officer**

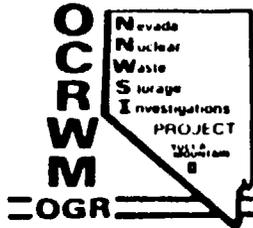
- separate "partitions" are used for private, NQ and Q1 tables**

- all work on the SEPDB is guided by AP 5.2Q and performed
under the Work Request system described by DOP 3-7**



Provisions of AP 5.2Q relevant to QA for the SEPDB

- Pls must interact in advance with DBA to ensure that data submittals meet SEPDB format
- data must be authorized by a TPO
- formal submittal is hard copy only (records)
- each submittal of limited scope
- submittals to be made "promptly" upon completion of data-gathering activity
- uniquely numbered "Data Authorization Package" contains all data, correspondence, requests for changes, etc.
- quality assurance level associated with each value
- local records center code associated with each value
- DBA to provide listing of final input values to TPO upon completion of entry into data base



DATA AUTHORIZATION FORM

NNWSI Site and Engineering Properties Data Base

send to:

NNWSI Data Base Administrator
 Geoscience Analysis Division 6315
 Sandia National Laboratories
 Albuquerque, New Mexico 87185
 telephone: (505 or FTS) 846-4922

The accompanying data were collected for the NNWSI Project, and they are hereby authorized for inclusion in the NNWSI Technical Data Base.

Brief description of type of data: _____

Identification numbers or codes on attached data sheets (or No. of Pages): _____

Published reference containing data (if any): _____

Local Records Center identification code: _____ QA Level: _____
 (note: if more than one, identify LRC/QA coding for each data value)

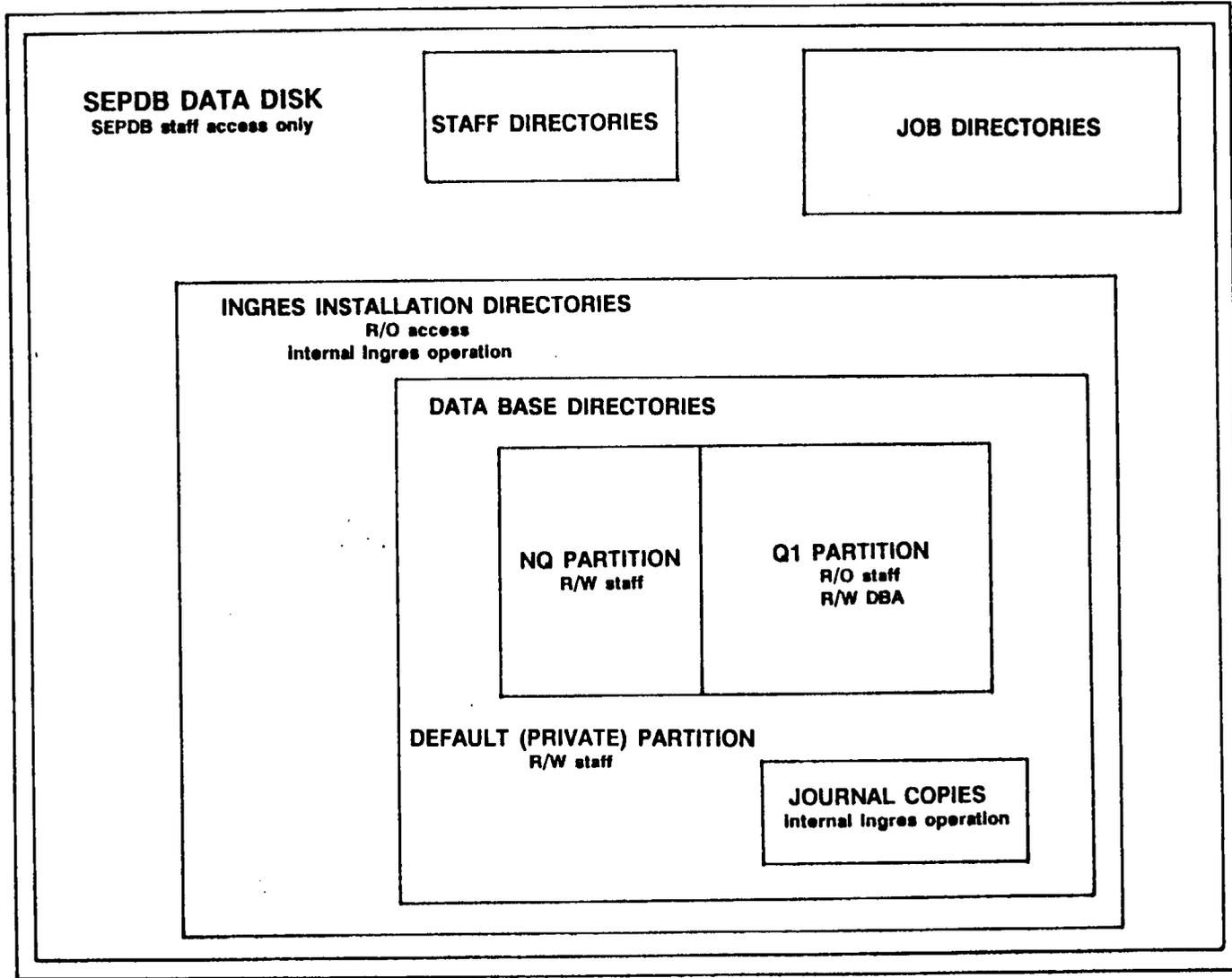
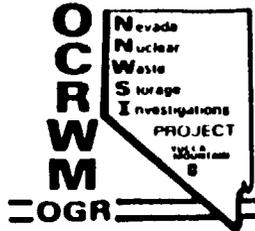
WBS Number of data-gathering activity: _____

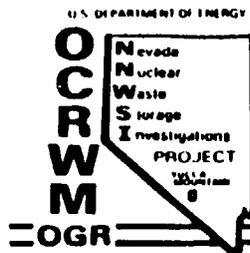
Note: if magnetic media are submitted in addition to the formal hard-copy submittal, please attach description/instructions.

TFO Signature: _____ Date: _____

Printed: _____ Organization: _____

Data Base Use
 Data Authori- Received
 sation Number: _____ by: _____ date: _____





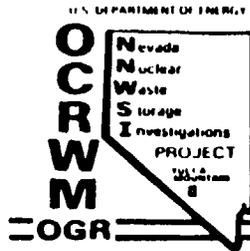
The Work Request/Documentation Log System of DOP 3-7

provides documentation of:

- what data base action was desired
- what was actually done
- who did the work

includes supporting evidence of:

- proper authorization
- input data
- verification
- results of work



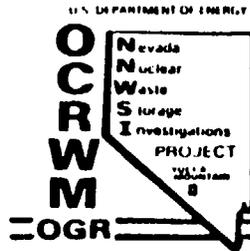
STEPS IN DATA BASE ENTRY

1. PI prepares data compilation package for TPO authorization.
2. TPO authorizes data submittal and sends to DBA.
3. DBA assigns Data Authorization Number and logs submittal into Status data base.
4. Work Request is prepared for data entry, verification, and insertion into Ingres.
5. Data is keypunched into ASCII file(s) and read into temporary data base table (private area).
or
Data is keypunched directly into temporary data base table.
6. Table is inspected for completeness and accuracy; "constant" fields are filled by "global" insert commands.
7. Housekeeping details: field descriptions are created/updated; data dictionary is updated; Status data base is updated



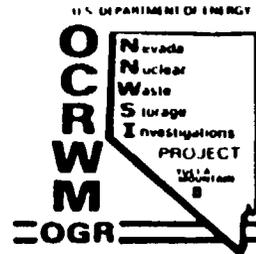
STEPS IN DATA BASE ENTRY

8. Temporary table is moved to NQ partition of data base (public area). Status data base is updated.
9. Table is verified against original TPO submittal by two independent listings and comparisons under separate Work Request.
10. Table is moved to Q1 partition of data base and appended to master data base table. Status data base is updated.
11. DBA prepares Ingres listing for return to authorizing TPO.
12. Work request documentation is verified to be complete. Work request is closed.



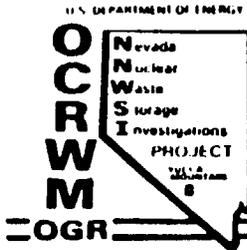
STEPS IN DATA BASE RETRIEVAL (Product Generation)

1. Requestor prepares work request describing the data needed, data qualifiers (if any), and the use to which the data will be put (briefly).
2. DBA consults with requestor to develop details of work request (if necessary).
3. DBA prepares ad hoc retrieval query or writes/modifies Report Writer program.
4. DBA executes retrieval.
5. DBA examines output for completeness and accuracy and assigns Product number.
6. Work request documentation is verified to be complete. Work request is closed.



The SEPDB is NOT:

- all things to all people
- the repository of "all" knowledge
- an on-line, real-time, user-friendly system
- a substitute for good research or engineering practice



Provisions of Draft AP 5.2Q with respect to parties outside the Yucca Mountain Project

This procedure shall also apply ... as identified on a case-by-case basis by the [Yucca Mountain] Project Manager."

"Parties outside the [Yucca Mountain] Project are most likely to be found in the role of requestors of information."

"Outside parties identified by the [Yucca Mountain] Project Manager or as originators of Project information shall be treated exactly as a project participant with respect to this [AP]."

"[A]n organization outside the [Yucca Mountain] Project entitled to submit or to request data directly to or from the [SEPDB shall designate] a contact individual ... to serve as TPO."

"Requests for information ... may be made by any person involved as a participant [Outside] parties ... shall obtain authorization from the [Yucca Mountain] Project Manager prior to submitting requests"

Constraints:

SEPDB VAX 8200 is part of Sandia Computing Facilities

-- Terminal Switching Network - secure/unclassified

(dial-up access is prohibited)

-- loss of access to TSN would require a separate

system for remote access within Sandia

VAX 8200 is a relatively "small" machine

-- limiting factor is CPU, not storage

-- Ingres is resource-intensive software package

Constraints:

Ingres is a powerful data base management system

-- power = flexibility + DANGER

-- creating a user-friendly, "fool-proof" system:

requires standardized (limited) functions

does not provide for specialized requests

requires major and on-going software development

imposes significant CPU overhead

is contra-indicated by TUFFDB experience

DEPARTMENT OF ENERGY

**OR
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Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

THE SNL NNWSI PROJECT DATA RECORDS MANAGEMENT SYSTEM

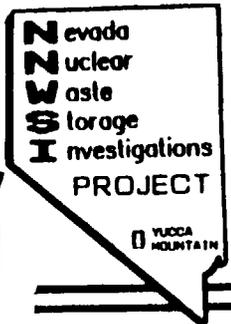


THE DATA RECORDS MANAGEMENT SYSTEM (DRMS)

**PRESENTED BY: BARRY M. SCHWARTZ
DRMS MANAGER
SNL DIV. 6313
(505)846-8268**

9/28/88

**OR
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THE SNL NNWSI PROJECT DATA RECORDS MANAGEMENT SYSTEM

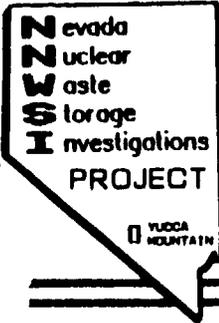


PURPOSE: ARCHIVE TECHNICAL RECORDS OF DATA-GATHERING ACTIVITIES

SNL NNWSI DATA-GATHERING ACTIVITIES ARE:

- **LABORATORY EXPERIMENTS**
- **FIELD EXPERIMENTS**
- **EQUIPMENT TESTS**

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HOW DOES THE DRMS MEET LICENSING REQUIREMENTS



- **DUAL FACILITY**
- **CONTROLLED ACCESS**
- **OPERATION CONTROLLED BY FORMAL PROCEDURES:**
 - **REQUIREMENTS FOR INITIATION OF DATA SETS, QUARTERLY UPDATES OF THE STATUS OF DATA SETS, AND FOR SUBMITTING RECORDS TO THE DRMS ARE DEFINED IN SNL NNWSI PROJECT DOP 11-3, "DRMS INTERACTION REQUIREMENTS."**
 - **REQUIREMENTS DEFINING OPERATION OF THE DRMS ARE DEFINED IN DOP 17-2, "OPERATION OF THE SNL NNWSI DATA RECORDS MANAGEMENT SYSTEM."**
 - **COMPUTER USER'S MANUAL**
- **COMPUTER INDEX OF ALL RECORDS IN DRMS (800 PAGES LONG)**
- **ON A QUARTERLY BASIS, A CATALOG OF ALL DRMS DATA SETS IS ISSUED**

CONTENT OF A DATA SET

**RECORDS IN DRMS DATA SET NOTEBOOKS
ARE FILED WITHIN ONE OF THE FOLLOWING
13 SECTIONS**

SECTION#	SECTION NAME
1.	EXPERIMENT AND EQUIPMENT-TEST PROCEDURES
2.	SAMPLE CUSTODY RECORDS/PHOTOGRAPHS
3.	DRMS DATA INDEX AND TRACKING SHEETS
4.	CORRESPONDENCE
5.	SAMPLE AND/OR SITE PREPARATION RECORDS
6.	TECHNICAL PROCEDURES
7.	DATA
8.	CALIBRATION RECORDS
9.	ANALYSIS OF RESULTS
10.	INSTRUMENTATION/DATA ACQUISITION RECORDS
11.	QUALITY ASSURANCE DOCUMENTS
12.	SUPPORTING INFORMATION
13.	REPORTS (DATA REPORTS AND OTHER REPORTS)

DRMS Table of Contents

=====

DATA SET ID: 51/L02-04/06/87 [Continued]

FILE NAME: Mechanical Properties

=====

8. CALIBRATION RECORDS [Continued]

SNL Calibration Certificate Dated 07/08/87 for Baldwin, Lima & Hamilton Load Cell (0 - 100,000 lbs.) Model # CXX, Serial # K758.

From: B Reese, SNL 7544 Date: 07/08/87
To: BM Schwartz, SNL 6313 Pages: 5

SNL Calibration Certificate Dated 03/02/88 for Serdex Temperature Humidity Recorder, Model # 22-7078, Serial # PL0583.

From: RL Crabb, SNL 7243 Date: 03/02/88
To: BM Schwartz, SNL 6313 Pages: 1

Letter Verifying Phone Conversation Concerning Calibrations.

From: PJ Boyd, NER Date: / /
To: RH Price, SNL 6313 Pages: 1

Cover Letter with Attached Documentation for Aluminum Calibration Standard.

From: PJ Boyd, NER Date: 06/28/88
To: RH Price, SNL 6313 Pages: 7

10. INSTRUMENTATION, DATA ACQUISITION RECORDS

Data Instruments Owners Manual for Model AB Pressure Transducer.

From: -----, Data Instruments Date: 03/01/86
To: ----- Pages: 4

Letter Listing Equipment Shipped to SNL for Calibration.

From: RJ Martin, NER Date: 04/27/87
To: RH Price, SNL 6313 Pages: 1

SNL Shipper #011138 Transmitting Equipment to New England Research.

From: BM Schwartz, SNL 6313 Date: 08/25/87
To: RJ Martin, NER Pages: 2

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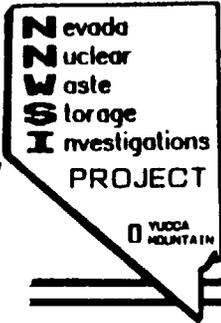


TYPES OF RECORDS IN DRMS

- **HARD COPY**
 - **PAPER (INCLUDING LOGBOOKS)**
 - MICROFICHE**
 - STRIP CHARTS**
- **PHOTOGRAPHIC MEDIA**
 - **PRINTS (COLOR & B&W)**
 - **SLIDES**
 - **NEGATIVES**
- **COMPUTER MEDIA**
 - **FLOPPY DISKS**
 - **CASSETTE TAPES**

BMS 9/20/88

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DRMS STATISTICS

NUMBER OF LABORATORY DATA SETS	142
NUMBER OF FIELD DATA SETS	19
TOTAL NUMBER OF RECORDS	5,905
TOTAL NUMBER OF PAGES	134,000
NUMBER OF SAMPLES IN SAMPLES DATA BASE	4,500

BMS 9/19/88

SANDIA NATIONAL LABORATORIES (SNL)
NNWSI PROJECT DATA RECORDS MANAGEMENT SYSTEM (DRMS)

DATA CATALOG

LABORATORY EXPERIMENTS

MECHANICAL PROPERTIES

SNL CONTACT: R. H. Price, 6313

DATA SET ID: 51/L02-06/06/84 QA LEVEL: TBD STATUS: Ongoing

DESCRIPTION: Fracture normal and shear behavior experiments on samples of the Topopah Spring member at Busted Butte (SNL data).

DATA SET ID: 51/L02-12/05/84 QA LEVEL: TBD STATUS: Completed

DESCRIPTION: Matrix compressive tests to determine parameter effects - temperature, pressure, strain rate, and saturation - on mechanical properties of the Topopah Spring Member at Busted Butte (SNL data).

DATA SET ID: 51/L02-05/01/85 QA LEVEL: TBD STATUS: Completed

DESCRIPTION: Characterization of matrix compressive properties of the welded Topopah Spring Member in UE-25a#1 (Terra Tek data).

DATA SET ID: 51/L02-06/26/85 QA LEVEL: TBD STATUS: Completed

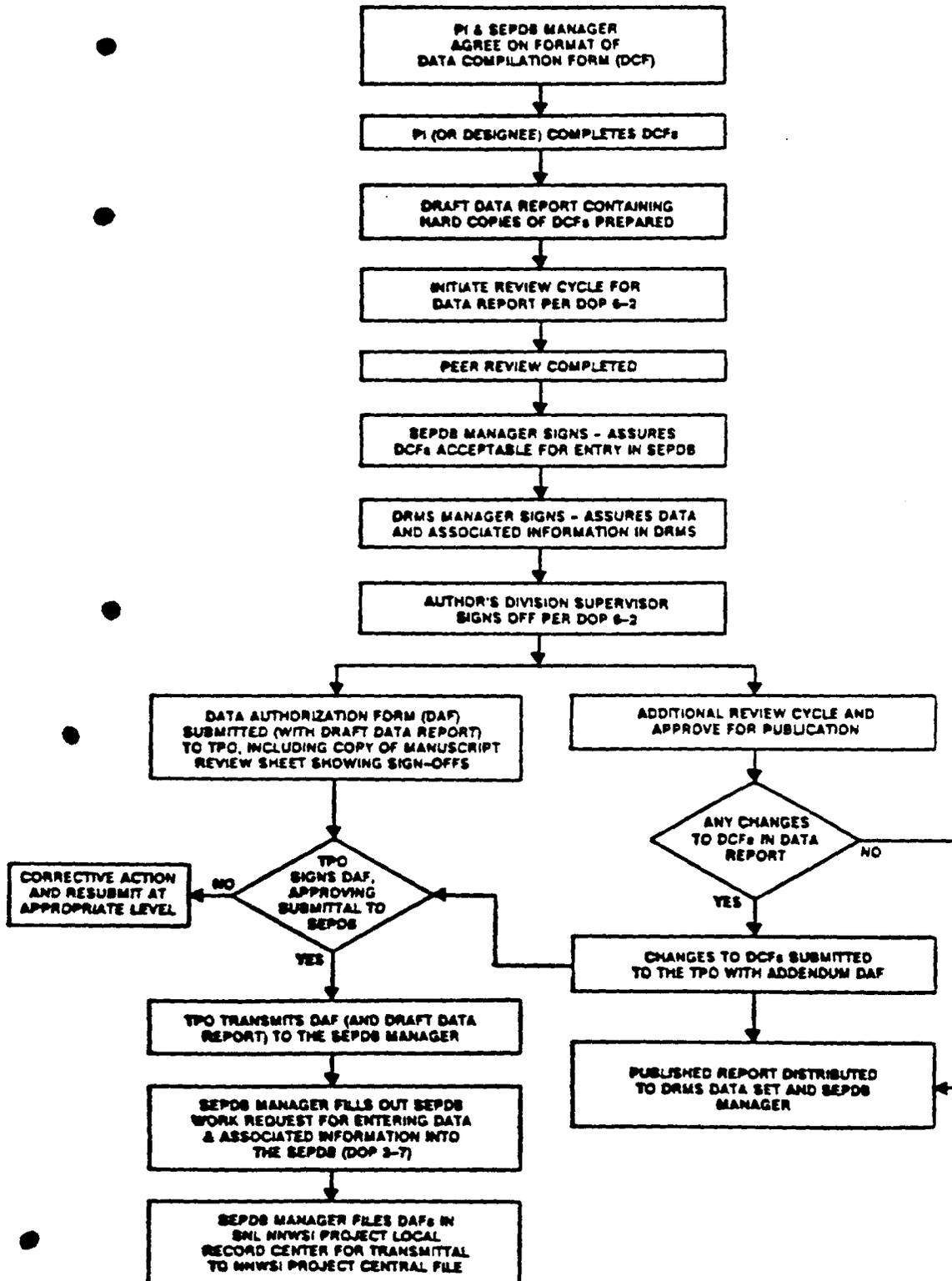
DESCRIPTION: Determinations of the effect of sample size on the matrix compressive properties of the welded Topopah Spring Member at Busted Butte (SNL data).

DATA SET ID: 51/L02-04/06/87 QA LEVEL: 1 STATUS: Ongoing

DESCRIPTION: Mechanical property data to analyze the response of Busted Butte Topopah Spring tuff to high temperatures and/or low strain rates per SNL NNWSI Project EP-0002 (NER data).

APPENDIX A

DATA FLOW FROM SNL DATA-GATHERING ACTIVITIES TO THE NNWSI PROJECT SEPDB



FLOW OF DATA FROM THE DRMS TO THE SEPDB



Sandia
National
Laboratories

- **PI WRITES EXPERIMENT PROCEDURE AND TECHNICAL PROCEDURES (IF APPLICABLE)**
- **DRMS MANAGER INITIATES DATA-SET ID, WHICH IS UNIQUE TO THE EXPERIMENT PROCEDURE**
- **RAW AND REDUCED DATA SUBMITTED TO DRMS**
- **PI AND SEPDB MANAGER ARRIVE AT ACCEPTABLE FORMAT OF DATA COMPILATION FORMS (DCFs)**
- **PI WRITES DATA REPORT WHICH INCLUDES DCFs AS APPENDICES PER DOP 3-11**
- **PI SUBMITS DATA REPORT FOR REVIEW**
 - **PEER REVIEW**
 - **DRMS REVIEW: RAW/REDUCED DATA?**
 - **SEPDB REVIEW: DCFs ACCEPTABLE?**
 - **MANAGEMENT REVIEW**
- **PI SUBMITS DRAFT DATA REPORT USING DATA AUTHORIZATION FORM (SIGNED BY TPO) TO SEPDB MANAGER**
- **DRMS DATA SET "CLOSED" AND SENT TO THE LRC FOR TRANSMITTAL TO THE PROJECT CENTRAL RECORDS FACILITY**

APPENDIX B

DATA AUTHORIZATION FORM
NNWSI SITE & ENGINEERING PROPERTIES DATA BASE (SEPDB)

WBS Number of data-gathering activity. _____

● QA Level(s) of SNL NNWSI Project data-gathering activity. _____ or

● For acceptance of data not developed under the NNWSI QA Plan, verification that the provisions of NNWSI Project SOP 03-03 or equivalent NNWSI Project Administrative Procedure have been met (if applicable). _____

● Data Records Management System (DRMS) Data-Set ID. _____

Data Report number and title. _____

Brief description of type of data submitted. _____

Does this submittal include additions to, request for removal, or modification of a previous submittal? If yes, provide the previous DAF number, indicate which data are to be removed or superceded, the data and information as it should be in the data base, and the reason for such removal (include attachments if necessary).

Attachments Included? _____

If magnetic media are supplied as a supplement to DCFs included in the Data Report, include instructions for accessing the computer files, define the number of tapes and/or disks, the number of files, and the size of each file.

Remarks regarding special storage format or data organization requirements.

● I certify the correctness of the information on this form and associated data on Data Compilation Forms contained in the Data Report referenced above and approve the data for entry into the NNWSI Project SEPDB.

Signature: _____ Date: _____

Printed: _____
SNL NNWSI Project TPO

DATA AUTHORIZATION
FORM NUMBER: _____ Signature of SEPDB Manager _____ Date _____

DEPARTMENT 6310 MANUSCRIPT REVIEW SHEET

Appendix A
to DOP 6-2
(Revised 08/18/88)

No. _____

Date _____

SAND _____

Title _____

Author(s) and Organization(s) _____

If contractor report, name of Sandia contract monitor and organization _____

If author from outside 6310, name of Dept. contact _____

Type of Manuscript:

() SAND Report
() Journal Article _____
(name of journal)

() Conference/Meeting Abstract or Paper _____
(name of Conf./meeting)

Attach your comments, initial below, and return the package to the author/contract monitor/contact by _____ . If you cannot complete your review by this date, please contact the author/monitor/contact as soon as possible. Do not complete the signature block until your comments and suggestions are resolved to your satisfaction; your signature indicates your final approval.^(a) All signatures and other entries must be in black indelible ink.

() d. tech. reviewer _____ Org. _____ Initials _____
Signature (final approval): _____ Date: _____

(c) Ind. tech. reviewer _____ Org. _____ Initials _____
Signature (final approval): _____ Date: _____

(d) Editorial reviewer _____ Org. _____ Initials _____
Signature (final approval): _____ Date: _____

() Editorial review not required _____
Division supervisor signature

(a) QA reviewer _____ Org. _____ Initials _____
Signature (final approval): _____ Date: _____

The manuscript has been reviewed by a Data Records Management System (DRMS) representative. All appropriate data and testing information have been provided to and placed into the DRMS.

Date Set ID 51/L04-1/10/85 Signature: Barry Schwartz 6313 Date: 9/21/88

The manuscript has been reviewed and approved for conformance with the Site Engineering Properties Data Base and the Reference Information Base.

SEPDB Signature: _____ Date: _____ RIB Signature: _____ Date: _____

Records Management System (RMS) index code _____

stone number _____ Precursor for Level 1 Milestone _____

THERMAL EXPANSION EXPERIMENTS DATA COMPILATION FORM FOR THE NNWSI PROJECT SEPDB

PART 1. SAMPLE LOCATION AND IDENTIFICATION

SAMPLE ID _____ SAMPLE ORIGIN _____
 SAMPLE DEPTH (ft) _____ TEST # _____

PART 2. PARAMETERS

HEATING CURVE DATA

TEMPERATURE RANGE DURING HEATING	°C	25-50	50-100	100-150	150-200	200-250	250-300
	°F	77-122	122-212	212-302	302-392	392-482	482-572
LINEAR THERMAL EXPANSION COEFFICIENT DURING HEATING ($10^{-6} \cdot ^\circ\text{C}^{-1}$) ^a							
ESTIMATED EXPERIMENTAL UNCERTAINTY ($10^{-6} \cdot ^\circ\text{C}^{-1}$) ^a							
PORE PRESSURE (MPa)							

COOLING CURVE DATA

TEMPERATURE RANGE DURING COOLING	°C	300-250	250-200	200-150	150-100	100-50	50-25
	°F	572-482	482-392	392-302	302-212	212-122	122-77
LINEAR THERMAL EXPANSION COEFFICIENT DURING COOLING ($10^{-6} \cdot ^\circ\text{C}^{-1}$) ^a							
ESTIMATED EXPERIMENTAL UNCERTAINTY ($10^{-6} \cdot ^\circ\text{C}^{-1}$) ^a							
PORE PRESSURE (MPa)							

PART 3. EXPERIMENT CONDITIONS

EXPERIMENT TECHNIQUE _____

SAMPLE LENGTH (cm)	SAMPLE DIA. (cm)	SAMPLE WIDTH (cm)	SAMPLE THICKNESS (cm)	PRE-TEST SAMPLE MASS (g)	POST-TEST SAMPLE MASS (g)

HEATING RATE (°C/min.)	COOLING RATE (°C/min.)	TYPE OF ATMOSPHERE	DRAINED OR UNDRAINED	CONFINING PRESSURE (MPa)	INITIAL SAMPLE SATURATION	TYPE OF PORE FLUID

PART 4. REFERENCE AND SUPPORTING INFORMATION

QA LEVEL _____ SNL NNWSI PROJECT DATA-SET ID 51/L01B- _____

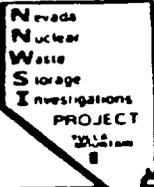
DATA REPORT NUMBER _____

THIS DCF COMPLETED BY: _____ ON _____ SNL DIV. _____ DATE _____

a. To obtain thermal expansion coefficients in units of $10^{-6} \cdot ^\circ\text{F}^{-1}$, multiply by 5/9.

COMMENTS

N/A = not applicable, N/C = not compiled, N/D = no data available.



PROCESS USED TO "CLOSE" DRMS DATA SETS



Sandia
National
Laboratories

- **DRMS RECORDS ADMINISTRATOR AND DRMS MANAGER:**
 - COMPARE RECORDS IN DATA-SET NOTEBOOKS WITH COMPUTER INDEX
 - VERIFY THAT THE RECORDS ARE LEGIBLE
 - VERIFY THAT DATA ARE ADEQUATELY IDENTIFIED

- **PRINCIPAL INVESTIGATOR:**
 - REVIEW RECORDS AND REQUEST CHANGES (IF NECESSARY)
 - REQUEST DISPOSITION OF "CLOSED" (IF APPLICABLE)

- **QA REVIEW:**
 - ACCEPT OR REJECT REQUEST FOR "CLOSED" DISPOSITION

- **OTHER SNL REVIEWS AND APPROVALS:**
 - CLASSIFICATION
 - PATENT/LEGAL REVIEW
 - PUBLICATION POLICY REVIEW

SUBMIT TO THE SNL PROJECT LOCAL RECORDS CENTER FOR TRANSMITTAL TO THE PROJECT CENTRAL RECORDS FACILITY



SUMMARY OF DATA MANAGEMENT AT SNL



Sandia
National
Laboratories

- **A DATA RECORDS MANAGEMENT SYSTEM (DRMS) IS OPERATIONAL.**
- **THE DRMS IS THE LOCATION WHERE RAW AND REDUCED DATA AND ASSOCIATED EXPERIMENT RECORDS CAN BE ACCESSED.**
- **ALL RECORDS IN THE DRMS ARE INDEXED ON A COMPUTER.**
- **A CATALOG OF DRMS DATA SETS IS ISSUED QUARTERLY.**
- **THERE ARE WRITTEN QA PROCEDURES WHICH ENSURE THAT THERE IS INTEGRATION BETWEEN THE DRMS, THE SEPDB, AND THE PROJECT CENTRAL RECORDS FACILITY.**

DATA MANAGEMENT
AT
LOS ALAMOS NATIONAL LABORATORY

R. J. HERBST

SEPTEMBER 28, 1988

WHAT DATA ARE WE WANTING TO MANAGE?

**....INFORMATION GENERATED AS PART OF OUR
TECHNICAL EFFORT IN SUPPORT OF THE
PROJECT.**

DATA ARE TECHNICAL INFORMATION PRODUCTS.

LOS ALAMOS CATEGORIZES DATA

- 0 RAW DATA**
- 0 REDUCED DATA**
- 0 INTERPRETED DATA**
- 0 REFERENCE DATA**

**RAW DATA ARE ORIGINAL OBSERVATIONS
THAT ARE RECORDED FOR THE PURPOSES
OF ANALYSIS AND INTERPRETATION.**

RAW DATA ARE

- 0 VOLUMINOUS**
- 0 MULTI-MEDIA**
- 0 UNORGANIZED**
- 0 UNQUALIFIED**

REDUCED DATA ARE

- 0 DERIVED FROM RAW DATA**
- 0 SYSTEMATICALLY PROCESSED**
- 0 PRIMITIVELY ORGANIZED**
- 0 UNQUALIFIED**

INTERPRETED DATA ARE

- 0 SUBSETS OF RAW AND REDUCED DATA**
- 0 REPORTED**
- 0 ORGANIZED**
- 0 INTELLECTUALIZED AND QUALIFIED, I.E.,
NARRATED**

....MAYBE CONTENTIOUS

THE DATA MANAGEMENT CHALLENGE

-RECORD RAW DATA, AND DESCRIBE ACQUISITION CONDITIONS.**
-DESCRIBE AND RECORD (DOCUMENT) REDUCED DATA AND DATA REDUCTION PROCEDURES.**
-DOCUMENT DATA INTERPRETATIONS.**
-REVIEW AND ACCEPT INTERPRETED DATA. LABEL ACCEPTED DATA "REFERENCE."**
-CAPTURE AND PRESERVE ALL CATEGORIES OF DATA.**
-ANNOUNCE DATA "EVENTS."**

**DATA ACQUISITION CONDITIONS AND REDUCTION PROCEDURES ARE
DOCUMENTED VIA**

STUDY PLANS

DETAILED TECHNICAL PROCEDURES

LABORATORY/FIELD NOTE AND LOG BOOKS

**DATA INTERPRETATIONS ARE DOCUMENTED
VIA THE TECHNICAL REPORT.**

DATA REVIEW AND ACCEPTANCE IS ACCOMPLISHED VIA

SEPDB PROCEDURES

RIB PROCEDURES

DATA EVENTS ARE ANNOUNCED IN

DATA CATALOGUE

TECHNICAL REPORTS

RIB C/R

DATA MANAGEMENT SYSTEM STATUS

- 0 LRC ESTABLISHED**
- 0 RM PROCEDURES**
 - SOURCE PROCEDURE COMPLETE**
 - LRC PROCEDURE DEVELOPING**
- 0 TECHNICAL REPORT SYSTEM OPERATIONAL**
- 0 L(T)RC INTERFACE PROCEDURES WITH DATA CATALOGUE, SEPDB AND RIB(?) NEEDED**
- 0 TECHNICAL RECORDS ORGANIZING BASIS AND TECHNICAL RECORDS SPECIFIC PROCEDURES NEEDED**

T&MSS

(SCIENCE APPLICATIONS INTERNATIONAL CORPORATION, WESTINGHOUSE, HARZA)

● **ENVIRONMENTAL**

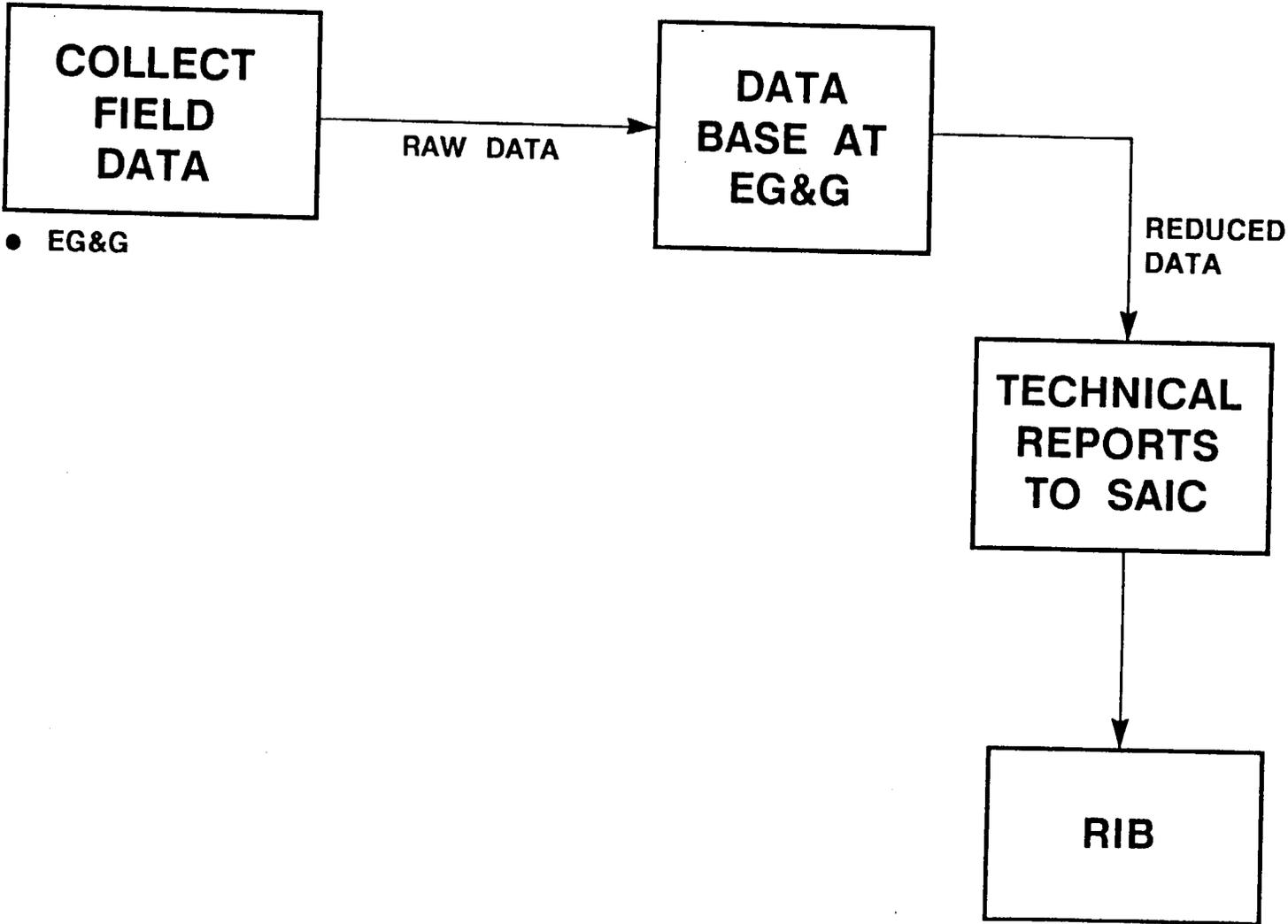
- **TERRESTRIAL ECOSYSTEMS**
- **ARCHAEOLOGICAL STUDIES**
- **METEOROLOGICAL MONITORING**
- **AIR QUALITY**
- **WATER RESOURCES**
- **SOIL DATA**
- **RADIOLOGICAL MONITORING**
- **RECLAMATION STUDIES**

● **SOCIOECONOMICS**

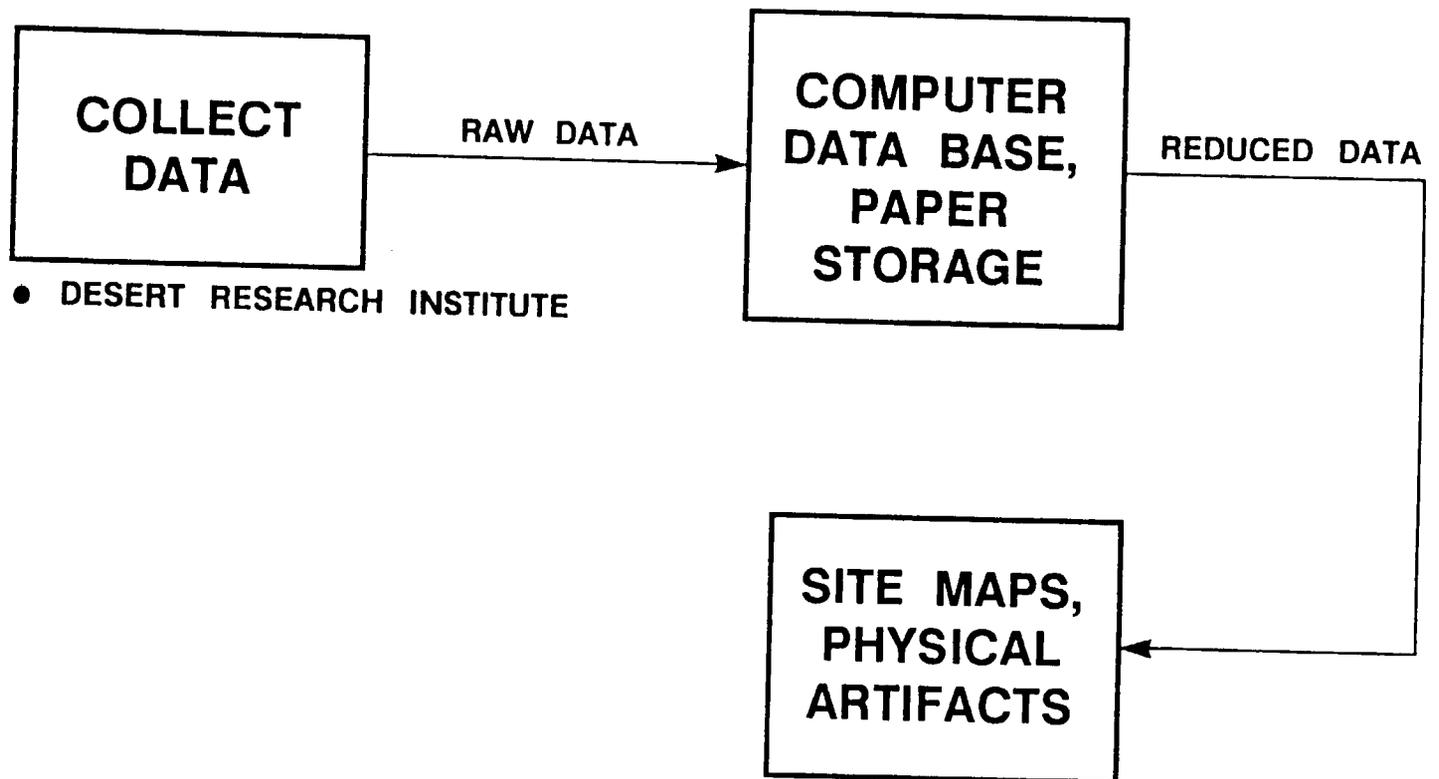
● **TRANSPORTATION**

● **ESF DESIGN**

TERRESTRIAL ECOSYSTEMS

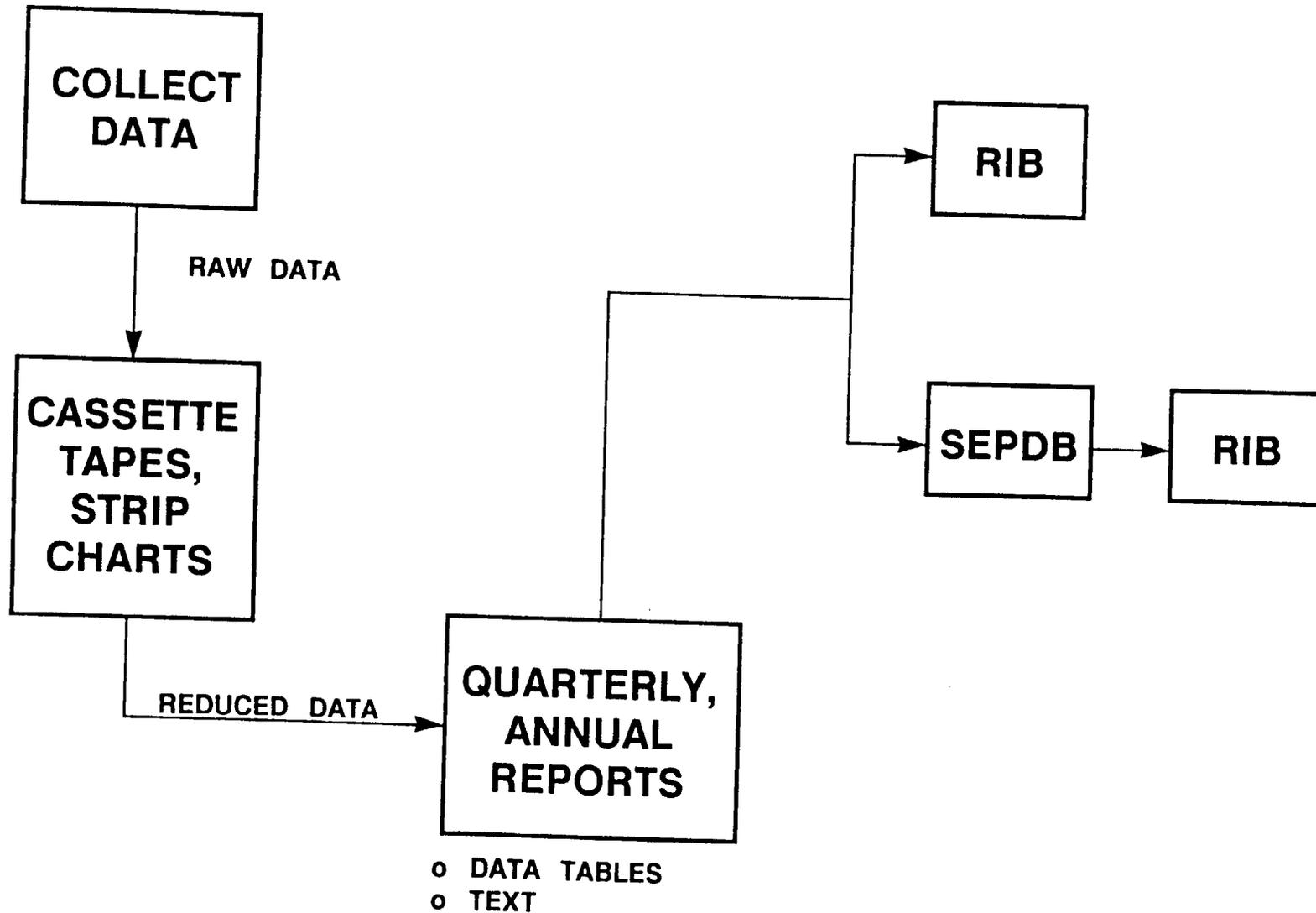


ARCHAEOLOGICAL STUDIES

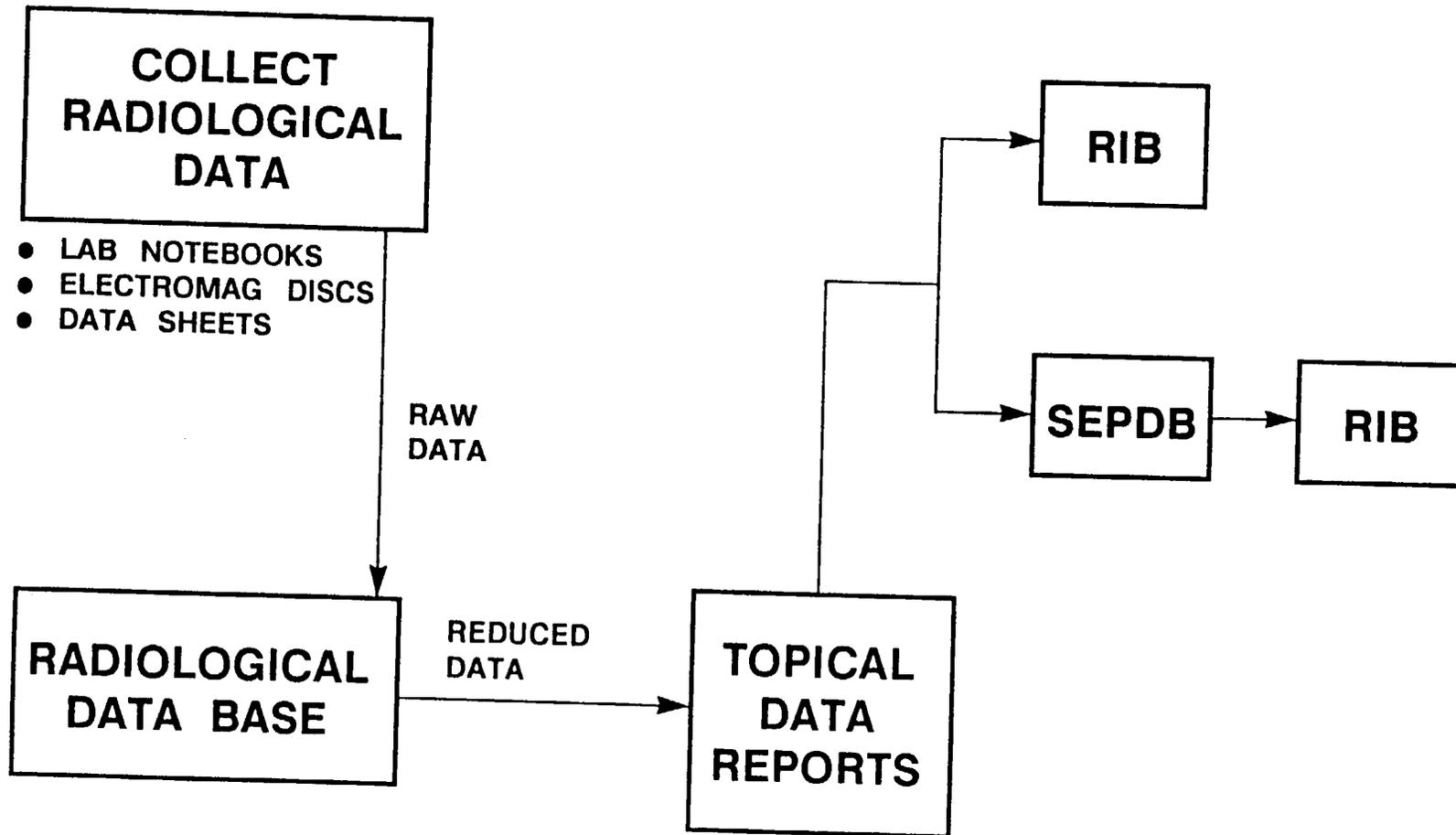


- SENSITIVE DATA
- INPUT TO RIB WHEN MECHANISM EXISTS TO SECURE ACCESS TO DATA

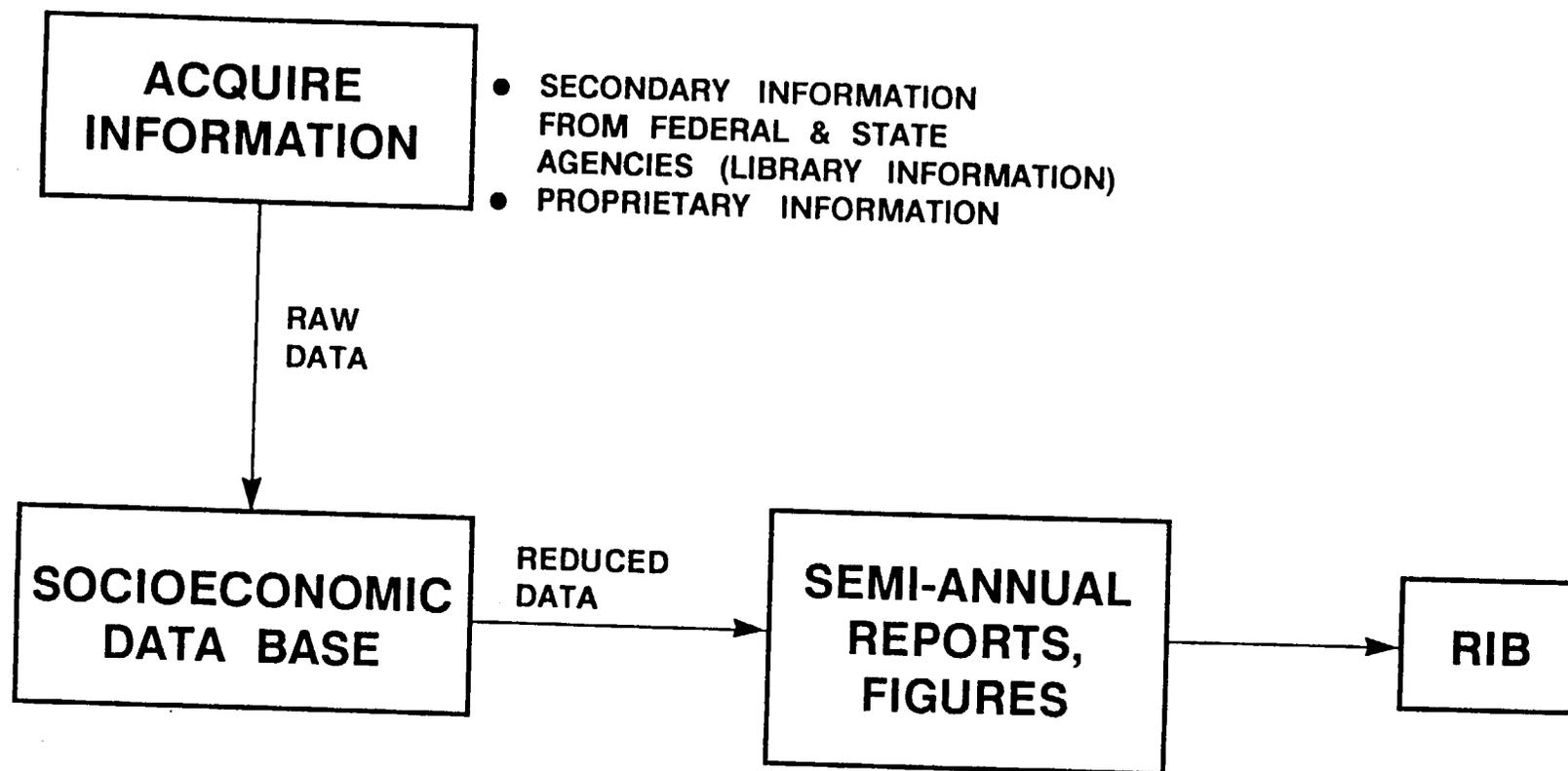
METEOROLOGICAL MONITORING



RADIOLOGICAL MONITORING

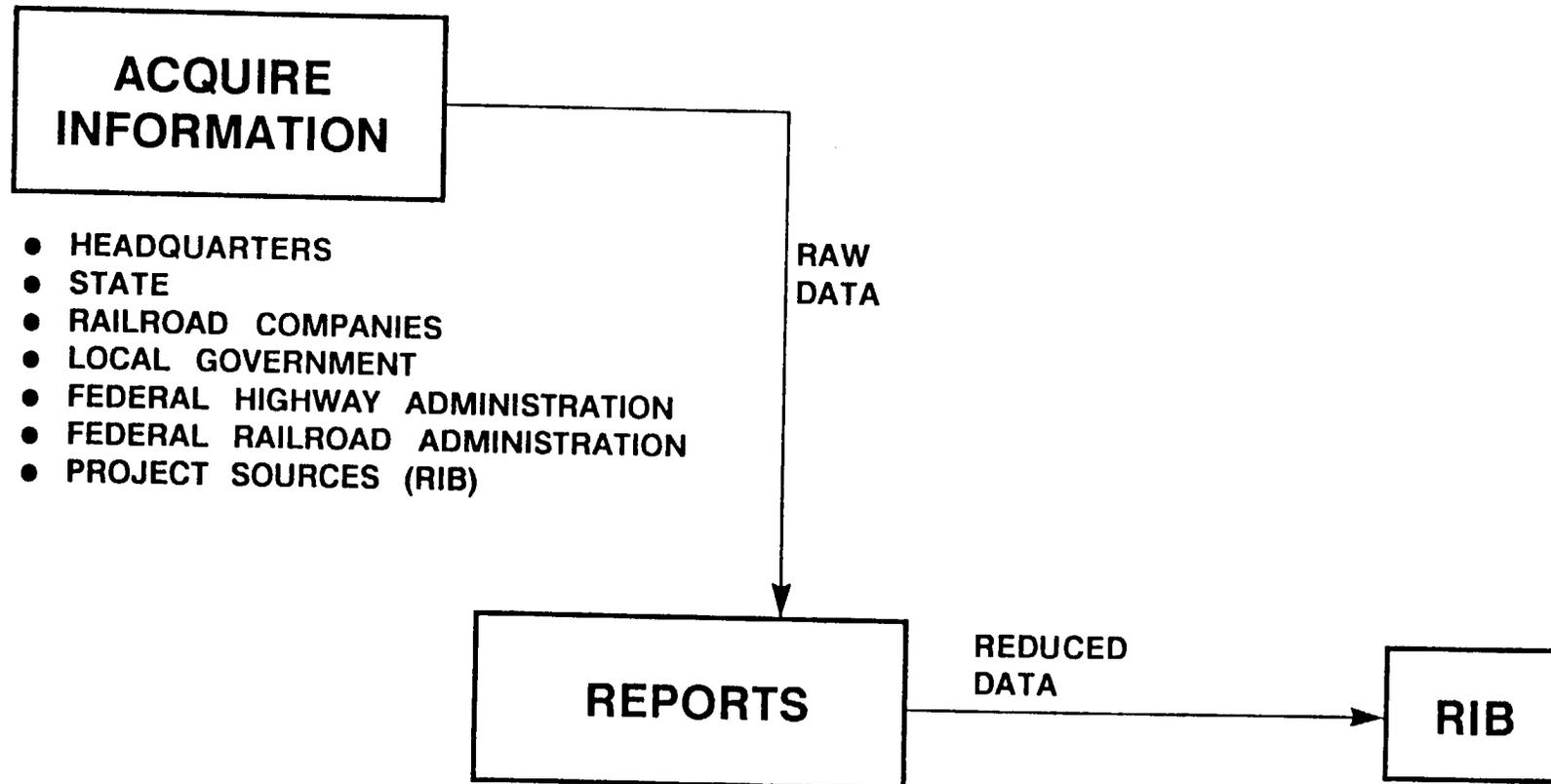


SOCIOECONOMICS



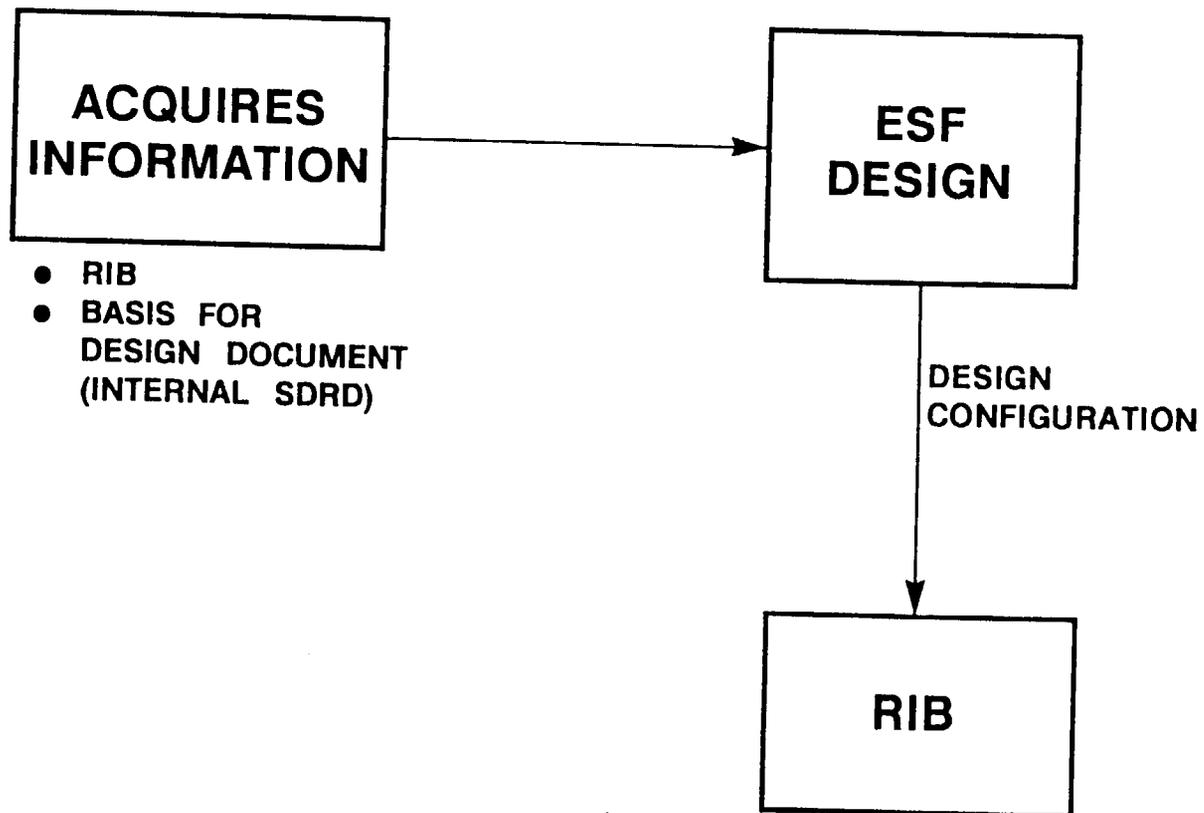
NOTE: SOME ACQUIRED DATA CANNOT RESIDE IN RIB BECAUSE DATA IS PROPRIETARY INFORMATION OR PROTECTED BY THE PRIVACY ACT

TRANSPORTATION



NOTE: SOME ACQUIRED DATA IS PROPRIETARY INFORMATION THAT CANNOT BE INCLUDED IN THE RIB.

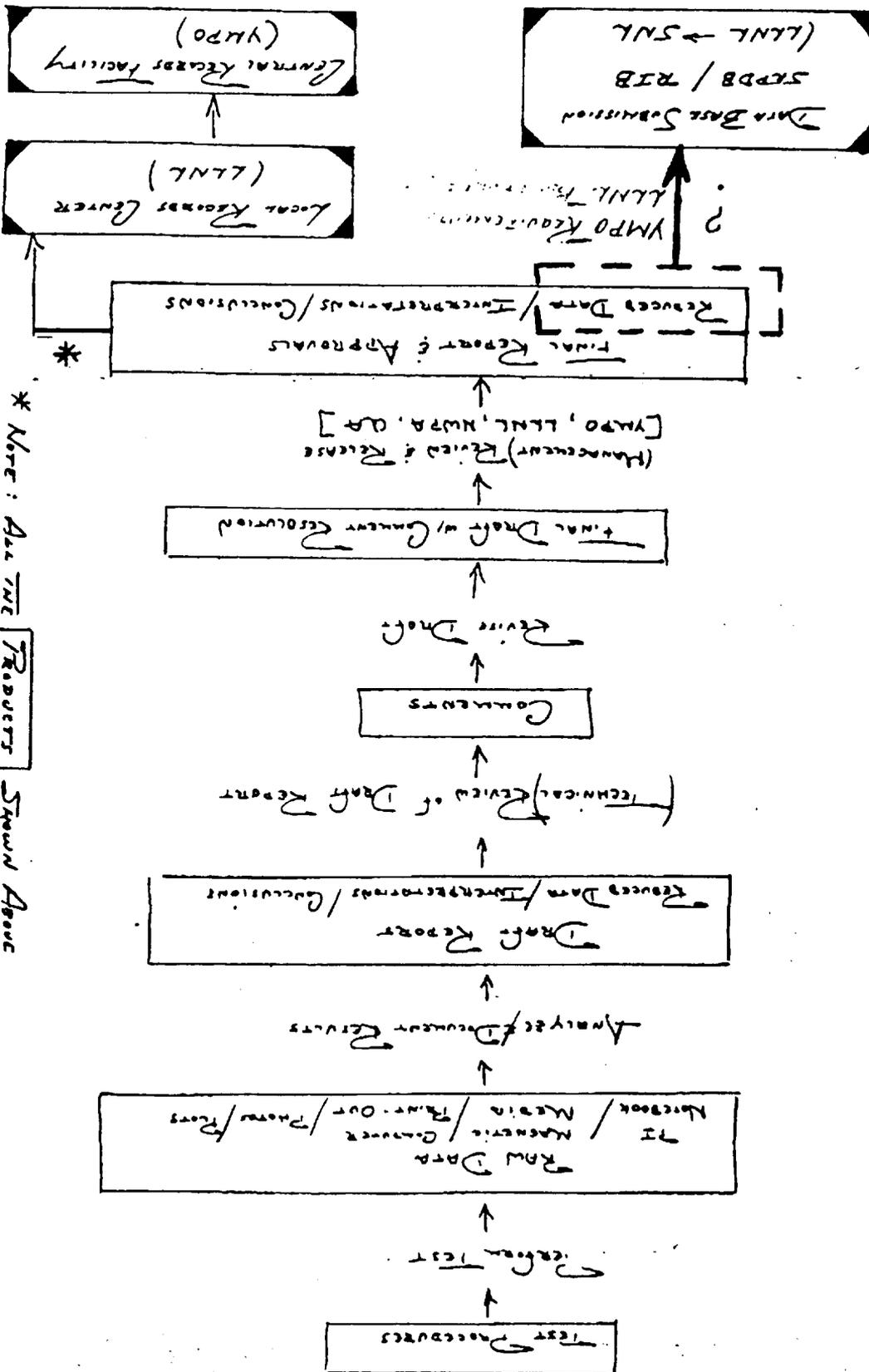
ESF DESIGN



DRAFT

Division Support System (DSS)

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* Note: All the Products Shown Above
 will be transferred to the Local
 Records Center at this time

9/11/88
 Revised

DRAFT

U. S. DEPARTMENT OF ENERGY

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Project

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HISTORY

DEFINITION OF PARAMETERS

PROCEDURAL PROCESS

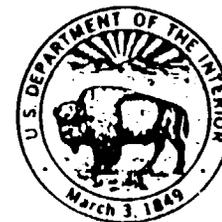
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HISTORY



-
- * **COOPERATIVE PROCESS WITH SNL**
 - IDENTIFICATION OF DATA TYPE**
 - DEFINITION OF TRANSMITTAL FORM**
 - DESCRIPTION OF PROCESS**
 - * **DEVELOPMENT OF USGS PROCEDURES**
-

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DEFINITION OF PARAMETERS



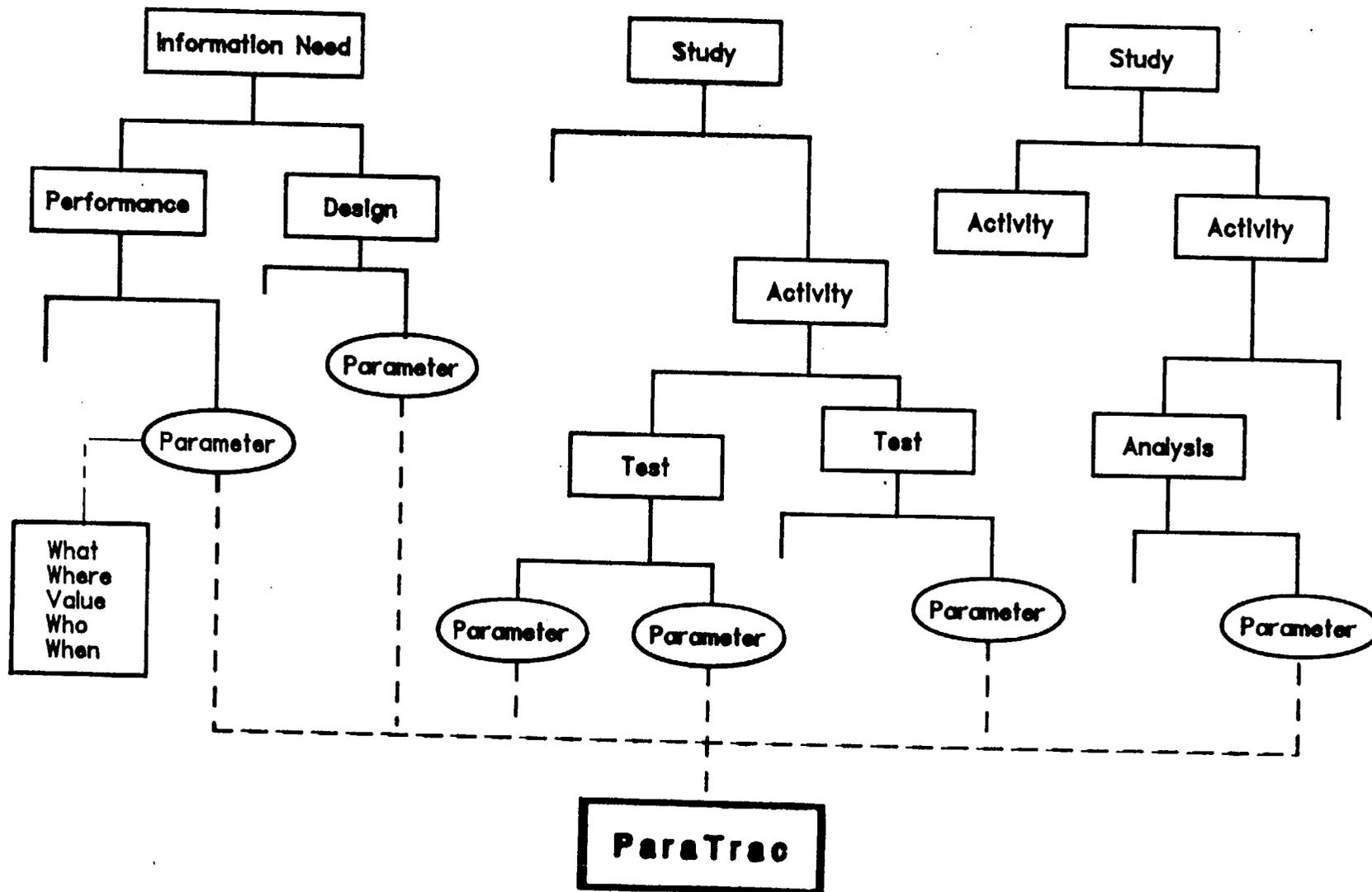
-
- * A QUANTITY THAT MUST BE MEASURED TO DEMONSTRATE THAT A GOAL ASSOCIATED WITH A PERFORMANCE MEASURE HAS BEEN MET [SCP].
 - * A PROPERTY, CHARACTERISTIC, AND/OR THE NUMERICAL VALUE OF A CONSTANT THAT IS USED TO DESCRIBE THE SITE GEOLOGIC, HDROLOGIC, AND CLIMATOLOGIC SYSTEMS [STUDY PLAN].
 - * A DATABASE RECORD THAT ACCOUNTS FOR WHAT IS MEASURED, WHERE IT IS MEASURED, AND IT'S ESTIMATED VALUE [PARATRAC].
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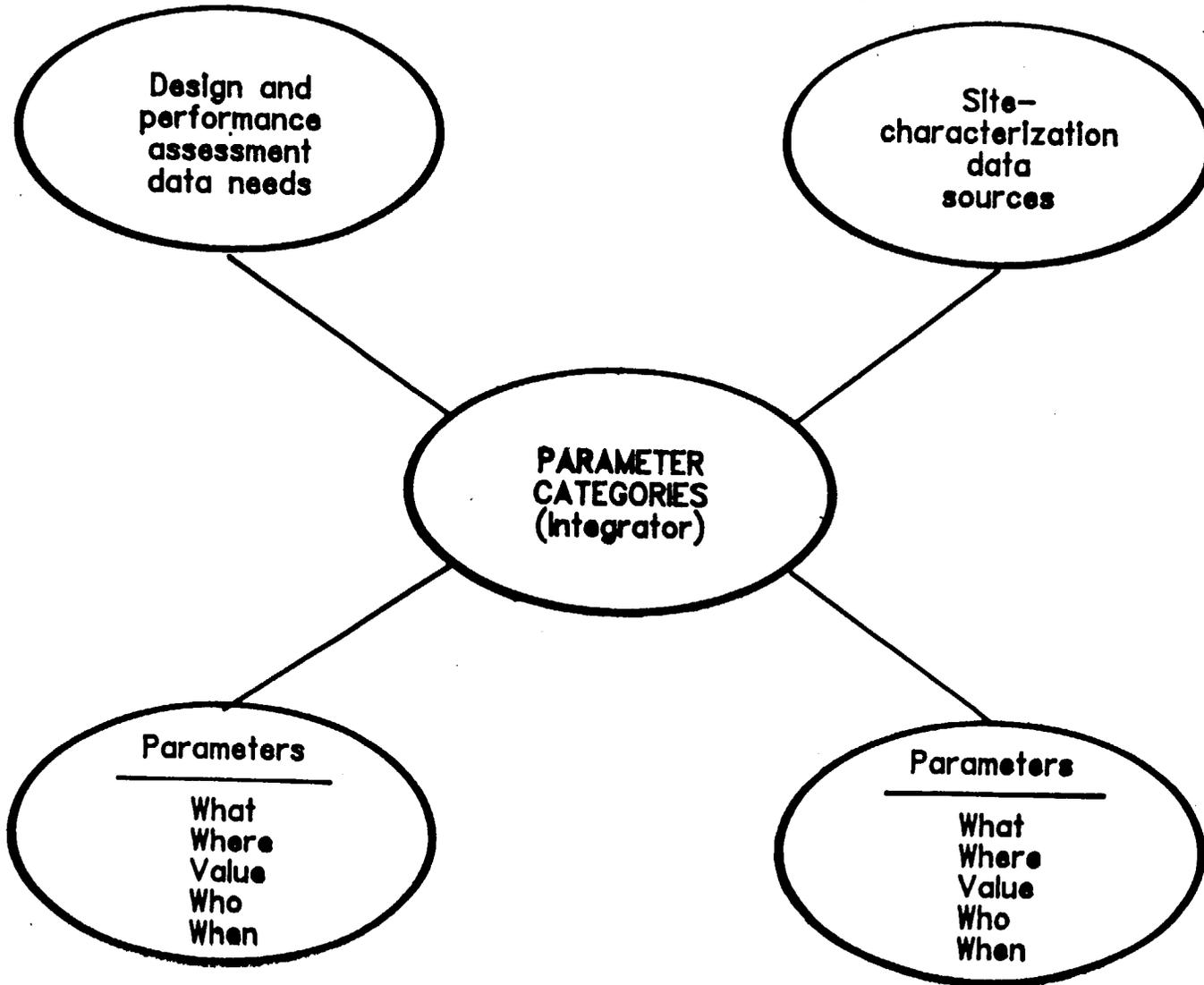
DEFINITION OF PARAMETERS



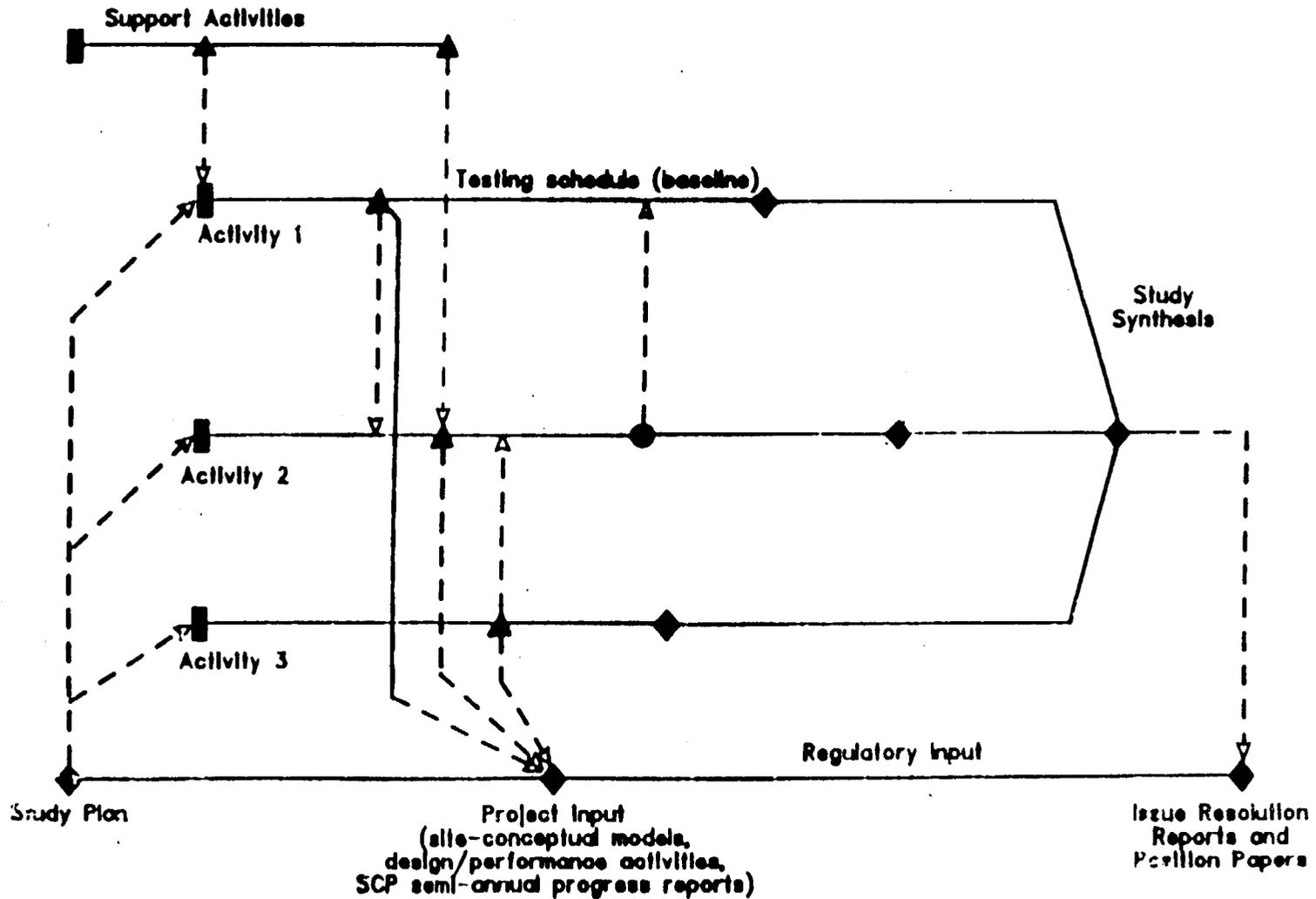
DEFINITION OF PARAMETERS



PARAMETER CATEGORIES



DEFINITION OF PARAMETERS



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PROCEDURAL PROCESS



1. **START DATA INTERPRETATION**
 2. **PREPARE PARAMETER LIST**
 3. **START Ms./COORD. DATA FORMAT**
 4. **COMPLETE DATA PACKAGE**
 5. **SUBMITTAL, REVIEW, PROCESSING OF DATA PACKAGE**
 6. **REVISE DATA PACKAGE**
 7. **TRANSMIT TO TDB**
-

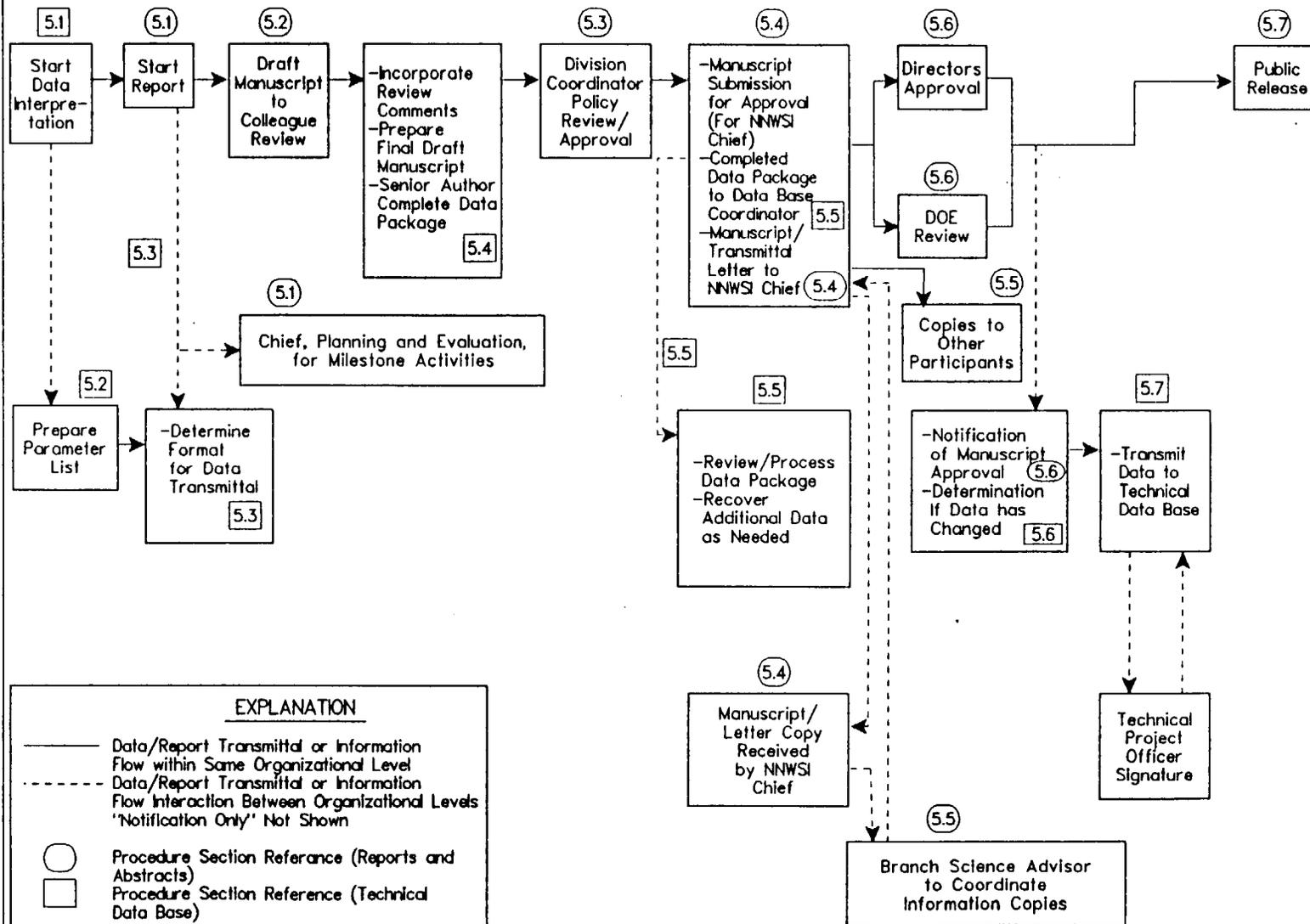
PROCEDURAL PROCESS FOR MANUSCRIPT REVIEW AND APPROVAL
AND PREPARATION AND SUBMITTAL OF TECHNICAL REPORT DATA
FOR PROJECT-LEVEL TECHNICAL DATA BASE

Organizational
Level

Division
Coordinator
(GD and
NHP)

Branch
Data Base
Coordinator

Branch
Chief
NNWSI



U.S. DEPARTMENT OF ENERGY

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**Yucca
Mountain
Project**

**YUCCA
MOUNTAIN**

STATUS



**DATA FROM 35 REPORTS
FORMALLY SUBMITTED**

**DATA FROM 14 REPORTS
ACCEPTED INTO SEPDB**

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Yucca
Mountain
Project

YUCCA
MOUNTAIN

SUMMARY



-
- * **COOPERATIVELY DEVELOPED PROCESS WITH SNL**

 - * **DEVELOPED USGS PROCEDURES**
 1. **PREDICT**
 2. **CROSS-CHECK**
 3. **FORMAT**
 4. **DOE APPROVAL**
 5. **TIMELY**
-