

106/SRG/84/12/20

DEC 20 1984

Mr. Jefferson O. Neff, Program Manager  
Salt Repository Project Office  
U.S. Department of Energy  
505 King Avenue  
Columbus, OH 43201-2693

Dear Mr. Neff:

Enclosed in this letter are the worksheets from the Hydrology Data Review held on May 14-17, 1984, and the Rock Mechanics Data Review held on August 21-24, 1984, in the SRPO offices in Columbus, Ohio. These worksheets consist of data inventory sheets, document review sheets and data review checklists. They document the data and reports which our staff and contractors reviewed during the course of the data reviews. At this time we have no additional observations to make other than those already included in the minutes of the data reviews and on the worksheets. As you are aware, NRC's data reviews are part of our staff preparation to review the draft EAs for salt. Therefore, observations collected during the data reviews will be combined with other review results in developing comments on the EAs and their supporting information.

If you have any questions regarding these worksheets please call Robert Johnson on 427-4785; Fred Ross on 427-4539 for hydrology data questions; or Jerry Pearring on 427-4686 for rock mechanics data questions.

Sincerely,

John J. Linehan, Section Leader  
Repository Projects Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

WM Record File

106

WM Project

16

Docket No.

PDR

LPDR

Distribution:

(Return to WM, 623-SS)

8501280728 841220  
PDR WASTE  
WM-16

DFC	:WMRP:ejc	:WMRP	:WMRP	:	:	:	:
NAME	:SGrace	:RJohnson	:JLinehan	:	:	:	:
DATE	:12/ /84	:12/ /84	:12/ /84	:	:	:	:

821

Distribution

WM S/ 3106

WMRP r/f

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CF

REBrowning

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JOBunting

HJMiller

JLinehan

MRKnapp

LBarrett

JKennedy

SCoplan

RBoyle

RJWright

RJohnson

RCook

PPrestholt

TVerma

JGiarratana

PDR

SGrace & r/f

JPearring

FRoss

BCooke

BFord

LPDR

## Enclosures:

1. Hydrology Data Review Worksheets
2. Rock Mechanics Data Review Worksheets
  - a) Summary Data Inventory Sheets
  - b) WMEG and WMGT Document Review Sheets
  - c) Draft Rock Mechanics Data Review Checklists

cc: T. Verma  
L. Casey  
R. Forsythe, MISS  
J. Friloux, LA  
L. Hare, UT  
S. Frishman, TX  
A. LaSala, USGS

OFC	: WMRP: ejc	: WMRP	RY	: WMRP	RY	:	:	:	:
NAME	: SGrace SRG	: RJohnson	for	: JLinehan	:	:	:	:	:
DATE	: 12/20/84	: 12/20/84	:	: 12/20/84	:	:	:	:	:

Enclosure 1  
12/20/85  
J. L. Luff  
J. L. Luff

Enclosure 1

NRC Hydrology Data Review Worksheets

May 14-18, 1984

PERMIAN BASIN

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Stone & Webster Eng. Corp., Formation Pressure Data File -  
Palo Duro Basin, Texas and New Mexico: Unanalyzed Data, Tech Report

1a. Is this in ~~draft~~ or final form? (Circle one) 1984

1b. Is this ultimately intended for ~~internal~~ DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total? NA  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/17/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Drill stem test inventory, see attached data sheets

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Palo Duro Basin Texas

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

literature

Amount of data: (Describe - if extensive attach data listing or table)

9/8 tests

Data sources: (organization responsible)

Data documented: (reference citation)

Data storage location: (specific location)

Battelle & Stone & Webster Eng. Corp.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Cgallata Aquifer Mapping Program Topical Report Revision 1*  
*ONWI/SUB/83/E512-05000-T16 Oct 1983*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: GERALD WINTER

Date: 5-17-84

## Salt Repository Project

### Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Groundwater

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Texas, includes Deaf Smith & Swisher Counties (17 counties)

(b) Subsurface location: (depth; formation)

Ogallala

Method of collection/analyses: (short description of method/analyses)

Water-well records & on-going monitoring programs

Amount of data: (Describe - if extensive attach data listing or table)

32 pages of well summary output

Data sources: (organization responsible)

Stone & Webster Eng. Co.

Data documented: (reference citation)

Reference list attached to report

Data storage location: (specific location)

ONUST

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

None noted



## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

TP 83-133 modeling the Deep Basin Hydrogeology of a Potential  
 B3-5311301-365 High Level Radwaste Site in Texas (6 P.D. Smith)

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at  
 this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
 by DOE/ONWI staff for each document. Therefore you may be directed  
 to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: Roy Z Williams

Date: 5/17/84

## Salt Repository Project

### Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

B3-5311301-365 modeling the Deep Basin Hydrogeology of a  
Potential High Level Radioactive Site in Texas  
(a paper presented at 1983 mtg of Assoc of Engineering  
Geologists).

Data Collection Location:

(a) Area Location: (general description with respect to basin/site,  
county, map location if available)  
Paleo Anso Basin Scale

(b) Subsurface location: (depth; formation)  
Surface to Basement

Method of collection/analyses: (short description of method/analyses)

Finite element <sup>flow</sup> models of cross sections through basin  
calibrated against heads from Drill Stem Tests.

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

SWEC - Preprint for paper presented at 1983  
mtg of AEG, San Diego

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

First paragraph, page 5 states that entire Paleo Anso Basin is  
underpressured, i.e., P vs depth data plot below hydrostatic pressure. 45°  
straight line. This is almost impossible to achieve outside oil fields. Perhaps  
all data are affected by oil fields? Or perhaps Phil Smith is confusing pressure data  
with head data. This should be resolved because if these data are misinterpreted it is  
apparent that one might conclude erroneously that the salt sequence (between Wolfcamp  
and Dockum) is a confining layer. End page 10 says the DST pressures are too low because the  
salt in times were too short for equilibration.

Permian

PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Harman #2, Summary Table, drill stem Test and Analysis

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total? NA  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/17/84

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Schlumberger Drill Stem Test

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

Schlumberger

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
*Pump in test and Flow Sample Report Sample No. 1 Ver 11*

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff? *10/1/84*

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

*I have done a check  
 analysis on this test  
 AGS*

Name: A Brown

Date: 4/17/84

## Summary Data Inventory Sheet

SAUCER-1 WENTH PROGRAMS REE DATA

2A-2 10/10/20

ERIN E. WILSON 4285-6342

5. 10. 1953

2 Wks. post: no other @ 5 min intervals

55

Data storage location: (specific location) *SNW*

NO FURTHER

NO FROM GAMA

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Infused faults in northern Palo Duro Basin Sketch 136 97-37-c*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: Reg E Williams

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
*Inferred faults in northern Palo Verde Basin*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)  
*Deaf Smith and vicinity counties*

(b) Subsurface location: (depth; formation)  
*Red cave through upper Clark fork*

Method of collection/analyses: (short description of method/analyses)  
*mapping of faults from outcrops & logs*

Amount of data: (Describe - if extensive attach data listing or table)  
*NA*

Data sources: (organization responsible)  
*SWEC*

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)  
*Inferred*

NRC Concerns: (Potential NRC concerns for further consideration)

*Too few data points*



## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Sketch 13697-36-A-2 <sup>< 50</sup> ~~Business~~ / ~~Sketch~~ Thick salt bed in 4SA 4

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?

In part? In total?

By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: W. E. Williams

Date: 5/16/84

## Salt Repository Project

### Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*Isopach map of a salt bed. Computer run S464CTBI, 12/1/83.  
Plot 1 sketch 13697-36-A-2*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

*Deaf Smith county*

(b) Subsurface location: (depth; formation)

*San Andreas*

Method of collection/analyses: (short description of method/analyses)

*Drill hole core + geophysical logs*

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

*SWEC*

Data documented: (reference citation)

Data storage location: (specific location) *ONW + columns*

Reported Qualifications: (Qualifications or uncertainties included in data document)

*none*

NRC Concerns: (Potential NRC concerns for further consideration)

*Limited number of data points (boreholes).*

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

BMI / ONWI - May 1984, Hydrogeologic Investigations  
Based on drill stem test data; Palo Duro Basin area, Texas &  
New Mexico.

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?

In part? In total?

By NRC staff? By DOE/ONWI staff?

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to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: Roy E Williams

Date: 5/12/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

BMI/ONWI - (no number)

Hydrogeologic investigations based on drill stem test data, Palo Duro Basin area, Texas and New Mexico.

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Palo Duro Basin - Permian Basin

(b) Subsurface location: (depth; formation)

Wolfcamp and Pennsylvanian aquifers

Method of collection/analyses: (short description of method/analyses)

Compilation of DST data from oil field wells + DOE wells. Data were screened statistically to eliminate man-made anomalies (oilfield pumping or oil field brine injection)

Amount of data: (Describe - if extensive attach data listing or table)

5502 DSTs but 8000 were screened out because they did not comply with shut in time + shut in pressure agreement criteria.

Data sources: (organization responsible)

SWEC

Data documented: (reference citation)

Data storage location: (specific location)

ONWI & SWEC (Baton Rouge)

Reported Qualifications: (Qualifications or uncertainties included in data document)

None

NRC Concerns: (Potential NRC concerns for further consideration)

This document needs intensive review. It is the source of the potential brine surge data for the Wolfcamp & Pennsylvanian aquifers + vertical flow data. THIS DOCUMENT MUST BE REVIEWED IN DETAIL PARTICULARLY THE STATISTICAL SCREENING PROCESS.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Sketch no. 136 97-37-H-E*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: Roy E Williams

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*Sketch 13697-37-H-2 Wolfcamp potentiometric surface map  
after culling depressed, overpressured, & under pressured data in  
Data Collection Location: Polk and Basin*

(a) Areal Location: (general description with respect to basin/site,  
county, map location if available)

*Deaf Smith & Assoc. Counties (Regional) (38 counties)  
+ part of N.M.*

(b) Subsurface location: (depth; formation)

*Wolfcamp*

Method of collection/analyses: (short description of method/analyses)

*Borehole pressure measurements*

Amount of data: (Describe - if extensive attach data listing or table)

*79 Boreholes*

Data sources: (organization responsible)

*SNEC*

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

*Limited data in vicinity of Deaf Smith County  
(4 points in 3 counties)*

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Sketch 13697-G(B)-29      Detachment profile      Section no. 1-12  
Friend no. 1*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

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- 1d. Proceed to attached sheet.

Name: Roy E Williams  
Date: 5/17/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*Geotechnical profile Section no 1 - 2, Friend no. 1*

Data Collection Location:

*Sketch 13697 - 2(B) - 29*

(a) Area Location: (general description with respect to basin/site, county, map location if available)

*Deaf Smith County*

(b) Subsurface location: (depth; formation)

*0 through 2840.2*

Method of collection/analyses: (short description of method/analyses)

*Borehole geophysical logs + Drill rate data*

Amount of data: (Describe - if extensive attach data listing or table)

*4 borehole geophysical logs + drill rate log  
Specific logs are gamma ray, caliper, Bulk density, Sonic log +  
Drill rate log.*

Data sources: (organization responsible)

*SWEC + logging contractor*

Data documented: (reference citation)

Data storage location: (specific location) *ONWT laboratory*

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

*NONE. These logs + their interpretations are  
straight forward.*



## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Sketch 13697-37-F-1*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
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By NRC staff? By DOE/ONWI staff?

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- 1d. Proceed to attached sheet.

Name: Roy S. Williams

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
*Sketch 13697-37-F-1 Penn. potentiometric surface after drilling  
Depressured, overpressured & under pressure data in northern*

Data Collection Location: *Palo Duro Basin*

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

*Deaf Smith & Garza counties*

(b) Subsurface location: (depth; formation)

*Pennsylvania*

Method of collection/analyses: (short description of method/analyses)

*Pressure Transducers*

Amount of data: (Describe - if extensive attach data listing or table)

*2 box files*

Data sources: (organization responsible)

*SWEC*

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

*This map is based on only 2 data points. The  
map covers 5 counties & part of New Mexico.  
Very creative!!*

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*W. H. Camp Potentiometric surface map after culling depressures, overpressured & underpressured data in northern Palo Verde Basin*

1a. Is this in draft or final form? (Circle one) *Sketch 13697-37-E-1*

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
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By NRC staff? By DOE/ONWI staff?

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1d. Proceed to attached sheet.

Name: R. E. Williams

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
*Sketch 13697 -37-E-1 Wolfcamp Potentiometric Surface after cutting  
Depressured, Overpressured + underpressured Data in northern Palo Duro Basin*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site,  
county, map location if available)

*Off Smith Co + vicinity*

(b) Subsurface location: (depth; formation)

*Wolfcamp*

Method of collection/analyses: (short description of method/analyses)

*Borehole water level & pressure measurements*

Amount of data: (Describe - if extensive attach data listing or table)

*7 boreholes*

Data sources: (organization responsible)

*~~SWEC~~ SWEC*

Data documented: (reference citation)

*7 Boreholes*

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

*limited data points*

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

*Sketch 13697-37-D-1 Zone of Dissolution of Zaver  
 Son address unit 4 ~~Sketch~~ Salt.*

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

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- 1d. Proceed to attached sheet.

Name: Roy S Williams

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*Zone of Dissolution / Lower San Andreas unit 4 salt  
Sketch 13697-37-D-1*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)  
*Deaf Smith and associated counties*

(b) Subsurface location: (depth; formation)  
*Lower San andreas*

Method of collection/analyses: (short description of method/analyses)

*Surface mapping + some touch logs  
(mapping of collapse features)*

Amount of data: (Describe - if extensive attach data listing or table)

*NA*

Data sources: (organization responsible)

*SWEC*

Data documented: (reference citation)

*NA*

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

*None*

NRC Concerns: (Potential NRC concerns for further consideration)

*Bores / mapped not defined*

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Report on Springs and Seeps in the Palo Duro Basin Area, Texas  
December 1982

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

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by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Name: John C. Crenshaw

Date: 5-17-89

## Salt Repository Project

### Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
spring locations, spring discharges, hydrochemistry data for springs

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)  
Pahr-Dipole Basin Area

(b) Subsurface location: (depth; formation)  
Ogallala Aquifer

Method of collection/analyses: (short description of method/analyses)

Water samples & flow measurements  
water level contour maps, potentiometric diagrams

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

State & Webster

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

Useful probably only for helping to explain  
potential conceptual models



## PRIORITIZATION DATA REVIEW CHECKLIST

## 1. Name, identification number, and date of document.

Sewell, M.J., 1984. Summary of Chemical & Isotopic Data produced by Bendix Field Engineering Corporation for Mansfield No. 1, Zeck No. 1, Sawyer No. 1, Frimmer No. 1 wells in the Texas Panhandle, ONWI Technical Report, Tables 1 & 4.

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: Leslie Peeter

Date: 17 May 1984

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*chemical analyses of brines and gas analyses of brines*

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

*Paleo { Sawyer #1 zone #1  
Duro { Mansfield #1 zone #1  
          #2 zone #1*

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

*see attached sheet*

Amount of data: (Describe - if extensive attach data listing or table)

*~ 17 pages*

Data sources: (organization responsible)

*TBES*

Data documented: (reference citation)



PARADOX BASIN

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

see page 2

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?

In part? In total?

By NRC staff? By DOE/ONWI staff?

~ August 1984

(as per Mike Dwyer)

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: John Peeter

Date: 16 May

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

- isotopic data for carbonate and anhydrite coresamples, & water samples  
- chemical data for water samples

Data Collection Location:

- gas data (helium, neon & argon)  
- mineralogical (x-ray diffraction) data

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

primary Paradox GD-1

also Lisbon Valley oil field and Salt Wash oil field

(b) Subsurface location: (depth; formation)

Elephant Canyon, Henker Trail, Paradox, Pinkerton Trail, Leadville Limestone,

Method of collection/analyses: (short description of method/analyses)

Amount of data: (Describe - if extensive attach data listing or table)

extensive

Data sources: (organization responsible)

WCC

Data documented: (reference citation) extensive references

Title: Status Report: Geochemical Interactions between Brines and Paleozoic Strata, Gibson Dome Area, SE Utah; Topical Report - February 1984

WCC: Bryan L. McCulley, John W. Thackston, Lynn M. Presic

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Ground Water Resources in the Part of Canyonlands National Park East of the Colorado River and Contiguous Bureau of Land Management Lands, Ut  
 - Submitted to National Park Service, Hutton & Richter (reverse order), April 1980

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: GERRY WINTER

Date: 5-16-84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Surface water (springs & seeps)  
Ground Water

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Canyonlands National Park & adjacent BLM lands east of Colorado River

(b) Subsurface location: (depth; formation)

Surface down to Homer Trail Form.

Method of collection/analyses: (short description of method/analyses)

Surface observation and measurement of springs

Amount of data: (Describe - if extensive attach data listing or table)

Spring-seep data appears to be original but well data appears to be from other sources

Data sources: (organization responsible)

University of Wyoming

Data documented: (reference citation)

List attached

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

Estimated seepage rates & permeabilities (from specific capacity data)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
 Elk Ridge No. 1 Borehole Elk Ridge Study Area of the Paradox Basin  
 Region San Juan County, Utah. ONWI - 401 August 1982
  - 1a. Is this in draft or final form? (Circle one)
  - 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)
  - 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at  
 this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?  
  
 (This question may need to be answered/verified/authorized  
 by DOE/ONWI staff for each document. Therefore you may be directed  
 to leave this question blank.)
  - 1d. Proceed to attached sheet.

Name: GERRY WINTER

Date: 5-16-84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Geophysical logs & QA Procedures

Data Collection Location:

- (a) Areal Location: (general description with respect to basin/site, county, map location if available)

Elk Ridge, Paradox Basin

- (b) Subsurface location: (depth; formation)

300 - 3481 ft depth

Method of collection/analyses: (short description of method/analyses)

Borehole geophysical logs

Amount of data: (Describe - if extensive attach data listing or table)

Gamma, caliper, bulk density, transit time, neutron porosity, temperature, & resistivity

Data sources: (organization responsible)

Woodward-Clyde, if a service company was used it was not noted

Data documented: (reference citation)

original

Data storage location: (specific location)

Woodward-Clyde

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

None noted.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Preliminary Hydrologic Budget Studies, Indian Creek Watershed and Vicinity,  
Western Pataxox Basin, Utah — no number — Sept 1983  
Thackston, Mangereila, & Preslo

- 1a. Is this in draft or final form? (Circle one)

Rough Draft

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: GERY WINTER

Date: 5-16-84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Surface water

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Indian Crk. watershed & vicinity (GD-1 in area)

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Estimated ET rates x area of coverage  
Precip. contribution direct to river flow  
Evap. rate from river  
Ground water discharge to river

Amount of data: (Describe - if extensive attach data listing or table)

Very little data, mainly estimates from literature for parameters.

Data sources: (organization responsible)

Woodward-Clyde

Data documented: (reference citation)

Reference list attached

Data storage location: (specific location)

Woodward-Clyde

Reported Qualifications: (Qualifications or uncertainties included in data document)

Numerous parameters (ET, etc) are estimated

NRC Concerns: (Potential NRC concerns for further consideration)

The degree of estimation used in report.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
*Second Status Report on Regional Groundwater Flow Modeling for the Paradox Basin, Utah, Intera, April 1984*
- 1a. Is this in draft or final form? (Circle one)
- 1b. ~~Is this ultimately intended for internal DOE/ONWI use or general publication?~~ (Circle one)
- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?
- (This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)
- 1d. Proceed to attached sheet.

Name: J. Rame  
 Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*No original data - references should be checked*

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
*Status Report on Regional Groundwater Flow Modeling for the Paradox Basin, Utah, Intera, First Draft: March 1983*
- 1a. Is this in draft or final form? (Circle one)
- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one) *as ONWI SOJ*
- 1c. Is expected publication date earlier than June 15? YES NO *May 1984*  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?
- (This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)
- 1d. Proceed to attached sheet.

Name: J. Rave  
 Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

*No original data - references should be checked*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Laboratory Testing of Rock and Salt Samples for determination of specific Gravity and Total Porosity, 9/20/83, Permian Basin Project,

1a. Is this in draft or final form? (Circle one) ONWI contract # 136 97-6110M

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total? NA  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/17/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

specific gravity & total porosity of rock & salt

Data Collection Location: samples in laboratory

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Palo Duro Basin, Tex

(b) Subsurface location: (depth; formation)

variable

Method of collection/analyses: (short description of method/analyses)

drill  
hole / Lab

Amount of data: (Describe - if extensive attach data listing or table)

4-5 data sheets

Data sources: (organization responsible)

RFI

Data documented: (reference citation)

Data storage location: (specific location)

RFI, Waltham, Ma

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

DOMES DOCUMENTS

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

PROBLEM DESCRIPTION / GEOLGY

Data Collection Location:

- (a) Areal Location: (general description with respect to basin/site, county, map location if available)

MISSISSIPPI / ILLINOIS

- (b) Subsurface location: (depth; formation)

AN

Method of collection/analyses: (short description of method/analyses)

SEISMIC (ANALYSIS)

Amount of data: (Describe - if extensive attach data listing or table)

NOTE - THE FOLLOWING MISSISSIPPIAN  
FORMATION IS BEING SAID

Data sources: (organization responsible)

EARTH SCIENCE

Data documented: (reference citation)

SEISMIC INTERPRETATIONS OF STRUCTURE

Data storage location: (specific location) ON 2

Reported Qualifications: (Qualifications or uncertainties included in data document)

N/A

NRC Concerns: (Potential NRC concerns for further consideration)

NONE

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

EW-ONWI-5226

BASIN DATA ANALYSIS, DECISION DURING THE  
FEBRUARY 1983 FROM 126 G. ONWI, EARTH TECHNOLOGY,

- 1a. Is this in draft or final form? (Circle one)

MAY 5, 1984

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?

In part? In total?

By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: A. Brown

Date: 5/6/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Surface & groundwater samples of ~~several~~ major tons

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Richton & Cypress Creek domes

(b) Subsurface location: (depth; formation)

various

Method of collection/analyses: (short description of method/analyses)

~~some~~ — ?)

Amount of data: (Describe - if extensive attach data listing or table)

These pages and maps

Data sources: (organization responsible)

some sampling in 1978, other unreported

Data documented: (reference citation)

U.S.G.S.

Data storage location: (specific location)

U.S.G.S. Jackson Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

who collected data prior to 1978

NRC Concerns: (Potential NRC concerns for further consideration)

How was data collected, QA concerns

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Results of Water Quality Sampling near Richton, Cypress Creek,  
and Hampton Salt Domes, Mississippi. Open File Report 80-443, ~~U.S.G.S~~

- 1a. Is this in draft or final form? (Circle one)

U.S.G.S

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is ~~expected publication date earlier than June 15?~~ YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?

~~In part? In total?~~

By NRC staff? By DOE/ONWI staff?

NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Monthly water level measurements of shallow wells around Richman

Data Collection Location: Cypress Domes & Vadenne Pine

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Domes see above

(b) Subsurface location: (depth; formation)

Shallow a few deep wells

Method of collection/analyses: (short description of method/analyses)

~~Various~~

Various

Amount of data: (Describe - if extensive attach data listing or table)

1 year, monthly

Data sources: (organization responsible)

Field, ~~Richman~~ Low Engineering

Data documented: (reference citation)

IERTEC, Inc.

Data storage location: (specific location)

CINUS

Reported Qualifications: (Qualifications or uncertainties included in data document)

method of data collection

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric - Level Monitoring Program - Mississippi and Louisiana :  
Annual Status Report for Fiscal Year 1983, Tech. Report, March 1984, BMI/ONWI-S25

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total? NA  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Data Collection Location: U.S. G.S. Aquifer tests, Transmissivity  
+ aquifer storage coeff.

(a) Areal Location: (general description with respect to basin/site,  
county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

Various

Method of collection/analyses: (short description of method/analyses)

compilation of file reports

Amount of data: (Describe - if extensive attach data listing or table)

400 aquifer tests

Data sources: (organization responsible)

U.S.G.S + State of Mississippi

Data documented: (reference citation)

U.S.G.S

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

No raw data from tests

NRC Concerns: (Potential NRC concerns for further consideration)

Useful for area consideration may wish to see  
specific test, data for those tests of special  
interest.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Results of Aquifer Tests in Mississippi by Roy Newcome, Sr.  
U.S.G.S Water Resources Div. Bulletin 71-2, 1971

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total? NA  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Water Quality, stratigraphy, flow velocities

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Cypress Creek & Rich ton domes, mississippi

(b) Subsurface location: (depth; formation)

Salt dome cap rocks and side deposits of miocene age

Method of collection/analyses: (short description of method/analyses)

Water chemistry, ~~titration~~ and stratigraphy, literature and field well data

Amount of data: (Describe - if extensive attach data listing or table)

Overview of site characteristics

Data sources: (organization responsible)

DOE wells and U.S. G.S. data

Data documented: (reference citation)

Various  
see 1A, Preliminary Report of the Geohydrology  
Near Cypress Creek and Rich ton Salt Domes, Perry County, mississippi.

Data storage location: (specific location) Water Resources Div., U.S.G.S.

100 W. Capitol St., Suite 710, Jackson, Miss. 39209 (601) 960-4500, Open File U.S.G.S. Louisiana  
Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Preliminary Report of the Geohydrology Near Cypress Creek and Richton Salt Domes, Perry County, Miss. Water Resources Investigations Report 83-4149 USGS & USDOE, by C.B. Bently - Open File Report

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total? NA  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/89

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Surface water flow and water quality data  
& groundwater levels & quality

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

~~Surface water~~ Various

Method of collection/analyses: (short description of method/analyses)

Standard U.S.G.S. QA

Amount of data: (Describe - if extensive attach data listing or table)

one year

Data sources: (organization responsible)

U.S.G.S.

Data documented: (reference citation)

U.S.G.S.

Data storage location: (specific location)

Tackson, Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Water Resources Data Mississippi, Water Year 1981  
U.S.G.S. Water Supply Data Report MS-81-1

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?

~~In part? In total?~~

~~By NRC staff? By DOE/ONWI staff?~~

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

water use map

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

various

Method of collection/analyses: (short description of method/analyses)

records of public supplies & estimated

Amount of data: (Describe - if extensive attach data listing or table)

one map and table for 1980

Data sources: (organization responsible)

U.S.G.S. & State of Miss. Dept of  
Natural Resources, Bureau of Land and Water Resources

Data documented: (reference citation)

~~U.S.G.S.~~

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

data collection

NRC Concerns: (Potential NRC concerns for further consideration)

uses of G.W near sites and source of water

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Water use in Mississippi, 1980, U.S.G.S. by J.A. Callahan

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total? NA  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
 Date: 5/16/84



Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

SURFACE WATER

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

WESLEY, WY

(b) Subsurface location: (depth; formation)

N/A

Method of collection/analyses: (short description of method/analyses)

GRAVIMETRIC

Amount of data: (Describe - if extensive attach data listing or table)

EXTENSIVE

Data sources: (organization responsible)

USGS

Data documented: (reference citation)

Data storage location: (specific location) WES

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

NSNG

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

LOW FLOW CHARACTERISTICS OF MISSISSIPPI STREAMS  
THARPE, 1975 USGS

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

LOW FLOW FOR REG OF DISPOSING WATER LAWS

3 - 3.5 CFS/82 mi 0 - 6" hr

Name: A. Brown

Date: 5/6/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
location of oil field production data

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

Variable

Method of collection/analyses: (short description of method/analyses)

Survey

Amount of data: (Describe - if extensive attach data listing or table)

Map of well fields & production data from fields

Data sources: (organization responsible)

State of Mississippi

Data documented: (reference citation)

~~Mississippi~~ Mississippi Oil & Gas Production Annual Report, 1982

Data storage location: (specific location)

Oil & Gas Board, Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

how does oil and gas production & injection affect  
groundwater flow direction, amount, density

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Mississippi Oil & Gas Production Annual Report, 1982, Mississippi  
State Oil and Gas Board

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this ~~document~~ be xeroxed and transmitted to NRC at  
this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

NA

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

injection data Shell Oil Company, onshore  
Wilcox reservoir, Well # 8-6

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Wilcox Reservoir, Mississippi

(b) Subsurface location: (depth; formation)

— ? —

Method of collection/analyses: (short description of method/analyses)

volume of injected fluids & pressures

Amount of data: (Describe - if extensive attach data listing or table)

~ 10 sheets of injection well data

Data sources: (organization responsible)

Shell Oil Company via Miss. State

Data documented: (reference citation)

Mississippi State Oil & Gas Board rec. Report.

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

Injection effects on G.W. flow around domes &  
aquifer permeabilities.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Mississippi State Oil & Gas Board, Monthly Report on Funds  
Injected, Producer Shell Oil Co.

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

- 1c. Is expected ~~publication~~ date earlier than June 15? ~~YES~~ NO  
If not, can this document be ~~xeroxed~~ and transmitted to NRC at  
this time?

In part? In total?

By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

DATA INVENTORY

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

LOUISIANA

(b) Subsurface location: (depth; formation)

SEMI-ARID

Method of collection/analyses: (short description of method/analyses)

HISTORICAL

Amount of data: (Describe - if extensive attach data listing or table)

SEE ATTACHMENT

Data sources: (organization responsible)

U.S. GEOLOGICAL SURVEY

Data documented: (reference citation)

U.S. GEOLOGICAL SURVEY

Data storage location: (specific location)

ON-SITE

Reported Qualifications: (Qualifications or uncertainties included in data document)

N/A

NRC Concerns: (Potential NRC concerns for further consideration)

TRANSFER TO SITE DOCUMENT

# PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
 Matter regarding USR Hall YES/USU (data)  
 and @ 5/11/81 from USU James Morrison.
- 1a. Is this in draft or final form? (Circle one)
- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)
- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?
- (This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)
- 1d. Proceed to attached sheet.

Name: Aaron  
Date: 5/6/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

brine chemistry

Data Collection Location:

- (a) Area Location: (general description with respect to basin/site, county, map location if available)

Big Flat

- (b) Subsurface location: (depth; formation)

Paradox Formation + Mississippian

Method of collection/analyses: (short description of method/analyses)

caveat: "obviously very few brine samples have been assayed completely and it must be remembered that these brines were inadvertently discovered and because of existing conditions at the time of the brine flows very few if any were accurately sampled."

Amount of data: (Describe - if extensive attach data listing or table)

~15 chemical water analyses

Data sources: (organization responsible)

Analyses were performed by chemists of USSS and by those of various company and commercial laboratories

Data documented: (reference citation)

document copied

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

see caveat under Method of collection/analyses

NRC Concerns: (Potential NRC concerns for further consideration)

Document was primarily addressing the potential for commercial brine production.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document. *Second Symposium on the Complex Salts & Brines of the Paradox Basin, May, 1984, E. J. ...*
- 1a. Is this in draft or final form? (Circle one)
- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)
- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff?
- (This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)
- 1d. Proceed to attached sheet.

Name: L. L. Porter  
 Date: 17 May 1984

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Brief description of geology, location of salt wells

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi, State wide

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

~~State~~ State data

Amount of data: (Describe - if extensive attach data listing or table)

tables + maps

Data sources: (organization responsible)

Mississippi state

Data documented: (reference citation)

Data storage location: (specific location)

Jackson, Miss

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Salt Water Disposal Wells in Mississippi by A.R. Bicker, Jr.  
Information Series MGS-72-4, Miss. Geological, Economic & Topographical Survey

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? ~~YES~~ NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

WA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

5 Brine tests were performed in domal salt at the Avery Island Salt mine.  
Primary measurements included temperature, moisture collection, pre & post  
Data Collection Location: test permeability

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Avery Island Salt mine

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Well

Amount of data: (Describe - if extensive attach data listing or table)

detailed

Data sources: (organization responsible)

RE/SPEC Inc.

Data documented: (reference citation)

Data storage location: (specific location)

ONWI

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

Thermal effects on salt

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Avery Island Brine Migration Tests: Installation, operation, Data Collection and Analysis, Wayne B. Krause of RE/SPEC Inc.

1a. Is this in draft or final form? (Circle one) ONWI-190(4), Tech report, 1983

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total? NA  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Cross Section & structure maps

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi, State wide

(b) Subsurface location: (depth; formation)

Winnona - Tallahatcha Aquifer

Method of collection/analyses: (short description of method/analyses)

drill @ holes & wells

Amount of data: (Describe - if extensive attach data listing or table)

Summary maps & regional cross sections

Data sources: (organization responsible)

U.S.G.S - Mississippi Board of Water

Commissioners

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S Jackson, Miss.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

The Winona - Tallahatchie Aquifer in Mississippi, by C.A. Spiers,  
U.S.G.S. Water Resource Div. 7-125, Jackson, Miss. 1977, Open File Report

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

N/A

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Potential etric

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi state wide

(b) Subsurface location: (depth; formation)

winona - Tallahatta Aquifer

Method of collection/analyses: (short description of method/analyses)

Wells

Amount of data: (Describe - if extensive attach data listing or table)

Summary map

Data sources: (organization responsible)

U.S.G.S + state of Mississippi

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S. Jackson Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric Map of the Winona-Tallahatcha Aquifer  
in Northwestern Mississippi, Feb 1979, By B. E. Wasson, U.S.G.S.

1a. Is this in draft or final form? (Circle one) open file report  
82-595

1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can ~~this document~~ be xeroxed and transmitted to NRC at  
this time?  
In part? In total? *NA*  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Near Surface geologic and isotopic study of cap rock

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Rayburn Salt Dome, La

(b) Subsurface location: (depth; formation)

shallow

Method of collection/analyses: (short description of method/analyses)

Drill hole

Amount of data: (Describe - if extensive attach data listing or table)

Cross section and isotopic dating

Data sources: (organization responsible)

LSU

Data documented: (reference citation)

Data storage location: (specific location)

Battelle

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

The Quaternary Geology of Rayburn's Salt Dome,  
Northern Louisiana Salt Dome Basin, Tech Report, 1983

1a. Is this in draft or final form? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total? NA  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Charles R. Kolb

Joseph C. Holmes

Institute of Environmental studies  
Louisiana State University

ONWI - 416

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Potential to enter with seasonal variations

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

State wide

(b) Subsurface location: (depth; formation)

Meridian - Upper Wilcox Aquifer

Method of collection/analyses: (short description of method/analyses)

Wells

Amount of data: (Describe - if extensive attach data listing or table)

Summary map + charts

Data sources: (organization responsible)

U.S.G.S + state of Mississippi

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S. Jackson, Miss.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric map of The meridian - upper Wilcox Aquifer in Mississippi, Fall 979, by B E. Wason, U.S.G.S., Water Resources

1a. Is this in draft or final form? (Circle one) Int. Open File  
Report 90-590

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff? NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/87

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Palynological, Tilt-meter, saline spring, surface water study

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Various in Mississippi

(b) Subsurface location: (depth; formation)

Method of collection/analyses: (short description of method/analyses)

Integrative + field

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

Mixed studies, hydrology aspects to bibliography  
with no summary.

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Typical Reports on Louisiana Salt Domes, ONWI - 417  
Tech. Report, Syst. 1983, Inst. for Env. Studies Louisiana State Univ.

1a. Is this in draft or final form? (Circle one) ~~draft~~ final

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Water level

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Risk land, Cypress, various re. Dunes

(b) Subsurface location: (depth; formation)

various, formations around dunes

Method of collection/analyses: (short description of method/analyses)

Level

Amount of data: (Describe - if extensive attach data listing or table)

One year quarterly samples

Data sources: (organization responsible)

ERTAC Dues

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric - Level monitoring Program - Mississippi & Louisiana  
Annual Status Report for Fiscal Year 1983, Tech. Report, March 1984

- 1a. Is this in draft or final form? (Circle one) Erba Inc.  
DOI/ONWI-525

- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

- 1c. Is expected ~~publication~~ date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total?  
By NRC staff? ~~By DOE/ONWI staff?~~ NA

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/17/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Cross section, maps, Water Quality table

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

Miocene aged aquifers

Method of collection/analyses: (short description of method/analyses)

~~10~~

Amount of data: (Describe - if extensive attach data listing or table)

Data sources: (organization responsible)

U.S.G.S. & Mississippi Board of  
Water Commissioners

Data documented: (reference citation)

U.S.G.S

Data storage location: (specific location)

U.S.G.S. Jackson, Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

general overview.

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

The Miocene Aquifer System in Mississippi, by Roy  
Newcome Jr., U.S.G.S. Water Resources Investigations 40-75

- 1a. Is this in draft or final form? (Circle one)

open file Report

- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO

~~If not, can this document be xeroxed and transmitted to NRC at  
this time?~~

~~In part? In total?~~

~~By NRC staff? By DOE/ONWI staff?~~

NA

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

regional cross section maps and regional structure map

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

State wide

(b) Subsurface location: (depth; formation)

Oligocene aged aquifer

Method of collection/analyses: (short description of method/analyses)

Summary maps

Amount of data: (Describe - if extensive attach data listing or table)

Some hydraulic conductivity data attached.

Data sources: (organization responsible)

U.S.G.S. & State literature

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S. Openfile, Mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

The Oligocene Aquifer System in Mississippi, Lynnette A. Gardl, U.S.G.S. Water-Resources Inv. 79-28, Jackson, Miss. 1979

1a. Is this in draft or final form? (Circle one) open file report

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
~~If not, can this document be xeroxed and transmitted to NRC at this time?~~

In part? In total?

By NRC staff? - By DOE/ONWI staff?

NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Potentiometric

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

State wide

(b) Subsurface location: (depth; formation)

lower Wilcox Aquifer

Method of collection/analyses: (short description of method/analyses)

Wells

Amount of data: (Describe - if extensive attach data listing or table)

Summary map

Data sources: (organization responsible)

U.S. G.S. + State of Mississippi

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S., Jackson Miss.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric map of the lower Wilcox Aquifer in Mississippi, Fall 1979, B.E. Wasson; U.S.G.S. open File Report 80-597

1a. Is this in draft or ~~final form~~? (Circle one)

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES ~~NO~~  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff? NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/87



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

lateral extent of aquifers with cross section &

Data Collection Location:

Some water quality data

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Mississippi

(b) Subsurface location: (depth; formation)

near surface

Method of collection/analyses:

(short description of method/analyses)

Various, wells, drill hole, etc.

Amount of data: (Describe - if extensive attach data listing or table)

Summary map

Data sources: (organization responsible)

U.S. G.S. & State of Mississippi Board  
of Water Commissioners.

Data documented: (reference citation)

Data storage location: (specific location)

U.S. G.S. Jackson, Miss.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

The Citronelle Aquifers in Mississippi, E. H. Boswell  
 U.S.G.S. Water Resource Investigations, 78-131, Open file report

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff? NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Fork

Date: 5/16/89

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Water Quality, water use, transmissivity, freshwater  
limits of aquifer

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site,  
county, map location if available)

State wide

(b) Subsurface location: (depth; formation)

large subsurface aquifer

Method of collection/analyses: (short description of method/analyses)

Literature, U.S.G.S. & state of Mississippi

Amount of data: (Describe - if extensive attach data listing or table)

Summary maps

Data sources: (organization responsible)

U.S.G.S. state of Mississippi

Data documented: (reference citation)

Data storage location: (specific location)

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Sources for Water Supplies in Mississippi, U.S.G.S.,  
Mississippi Research and Development Center, Jackson Miss, 1980

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

- 1c. Is expected publication date earlier than June 15? ~~YES NO~~  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total? N/A  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

ground water flow, facies changes, geological structure, recharge & discharge

Data Collection Location: fresh water - saltwater interface

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Southern Mississippi

(b) Subsurface location: (depth; formation)

Deep Sections

Method of collection/analyses: (short description of method/analyses)

Literature

Amount of data: (Describe - if extensive attach data listing or table)

cross sections, structure maps, water quality data

Data sources: (organization responsible)

U.S.G.S.

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S. Jackson, Miss.

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

A preliminary Report of the Geohydrology of the Mississippi  
Salt-Dome Basin, U.S.G.S. Water-Resources Invest. Open-File Report 80-595

- 1a. Is this in draft or final form? (Circle one)

- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)

- 1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total?  
By ~~NRC~~ staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford  
Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Potentiometric with seasonal variations

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

State wide

(b) Subsurface location: (depth; formation)

Sparta Aquifer

Method of collection/analyses: (short description of method/analyses)

Wells

Amount of data: (Describe - if extensive attach data listing or table)

Summary map and charts

Data sources: (organization responsible)

U.S.G.S. and state of mississippi

Data documented: (reference citation)

Data storage location: (specific location)

U.S.G.S. state of mississippi

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
 Potentiometric map of the Sparta Aquifer System in Mississippi, Fall 1980, by B.E. Wasson, U.S. G.S. Water Resources Invest.
  - 1a. Is this in draft or final form? (Circle one) Open file report SI-1051  
1982
  - 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)
  - 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at  
 this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff? NA
- (This question may need to be answered/verified/authorized  
 by DOE/ONWI staff for each document. Therefore you may be directed  
 to leave this question blank.)
- 1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/89



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
*Potentiometric and seasonal variations*

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

*State wide*

(b) Subsurface location: (depth; formation)

*Cock Field Aquifer*

Method of collection/analyses: (short description of method/analyses)

*Wells*

Amount of data: (Describe - if extensive attach data listing or table)

*Summary map and charts*

Data sources: (organization responsible)

*U.S.G.S. + state of Mississippi*

Data documented: (reference citation)

Data storage location: (specific location)

*U.S.G.S. Jackson, Miss.*

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Potentiometric map of the Cockfield Aquifer in Mississippi,  
by B.E. Wasson, U.S.G.S. Water-Resource Inv. Open File report 81-4053

1a. Is this in draft or final form? (Circle one) 1981

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff?

NA

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: William Ford

Date: 5/16/89

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

MODERN

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

MISS

(b) Subsurface location: (depth; formation)

AN

Method of collection/analyses: (short description of method/analyses)

COUNTDOWN ANALYSES

Amount of data: (Describe - if extensive attach data listing or table)

LAKE

Data sources: (organization responsible)

CONTRACTOR (EPA)

Data documented: (reference citation)

VARIOUS

Data storage location: (specific location) 1/10/80, 1/1/80

Reported Qualifications: (Qualifications or uncertainties included in data document)

VARIOUS

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

ONWI/ES12-0240.1 TR-30 410C-00G-0813  
 Second Status Report on Regional & Local Groundwater  
 Also including for Reclamation & Cyprus Cross-Border, etc.

1a. Is this in draft or final form? (Circle one) 3rd Oct, May 3. Inter

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?

In part? In total?  
 By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)

1d. Proceed to attached sheet.

Name: A. Brown

Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

report overview ~~geophysical~~ logs

Data Collection Location:

(a) Area Location: (general description with respect to basin/site, county, map location if available)

Southern East Texas Basin

(b) Subsurface location: (depth; formation)

deep

Method of collection/analyses: (short description of method/analyses)

literature + geophysical logs

Amount of data: (Describe - if extensive attach data listing or table)

maps and logs

Data sources: (organization responsible)

Data documented: (reference citation)

Data storage location: (specific location) ?

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Wilcox Cox Facies and Syndepositional Salt Dome Growth,  
Southern East Texas Basin, S.J. Seni and G.E. Fogg

1a. Is this in draft or final form? (Circle one)1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total? NA  
By NRC staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Name: William FordDate: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Cross section & structure map/2

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

Trinity River Valley, Leon County, Texas

(b) Subsurface location: (depth; formation)

~~strata~~

Method of collection/analyses: (short description of method/analyses)

field & literature

Amount of data: (Describe - if extensive attach data listing or table)

small amount

Data sources: (organization responsible)

Texas Bureau of Economic Geology  
Univ. of Texas

Data documented: (reference citation)

Data storage location: (specific location)

Austin Texas

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Quaternary Faulting in East Texas, Geological Circ.  
 80-1, E. W. Collins, D. K. Hobday, ~~and~~ C. W. Kreitzer, 1980

- 1a. Is this in draft or final form? (Circle one) ~~By~~ Bureau of  
 Economic Geology, U. of Texas
- 1b. Is this ultimately intended for internal DOE/ONWI use or general  
publication? (Circle one)
- 1c. Is ~~expected~~ publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at  
 this time? NA  
 In part? In total?  
 By ~~NRC~~ staff? By DOE/ONWI staff?

(This question may need to be answered/verified/authorized  
 by DOE/ONWI staff for each document. Therefore you may be directed  
 to leave this question blank.)

- 1d. Proceed to attached sheet.

Name: William Ford

Date: 8/16/84



# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)  
*philosophy or raises issues*

Data Collection Location:

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

*East Texas Basin*

(b) Subsurface location: (depth; formation)

*NA*

Method of collection/analyses: (short description of method/analyses)

*NA*

Amount of data: (Describe - if extensive attach data listing or table)

*philosophy or raises issue*

Data sources: (organization responsible)

*literature*

Data documented: (reference citation)

Data storage location: (specific location)

*Univ. of Texas at Austin*

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.  
*Studies of the Suitability of Salt Domes in East Texas Basin for Geologic Isolation of Nuclear Wastes by Charles W Kreitler*
- 1a. Is this in draft or final form? (Circle one)
- 1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)
- 1c. Is expected publication date earlier than June 15? YES NO  
 If not, can this document be xeroxed and transmitted to NRC at this time?  
 In part? In total?  
 By NRC staff? By DOE/ONWI staff? *NA*
- (This question may need to be answered/verified/authorized by DOE/ONWI staff for each document. Therefore you may be directed to leave this question blank.)
- 1d. Proceed to attached sheet.

Bureau of Economic Geol.  
 Univ. of Texas at Austin  
 1980  
 Geological Circ. 80-5

Name: William Ford  
 Date: 5/16/84

# Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: (Data inventory index identifier plus specific subclass of data)

Data Collection Location: Hydrology, geochemistry, geology, petrology, Isotope dating

(a) Areal Location: (general description with respect to basin/site, county, map location if available)

East Texas Basin

(b) Subsurface location: (depth; formation)

surface & deep.

Method of collection/analyses: (short description of method/analyses)

field & literature, summary of on going studies.

Amount of data: (Describe - if extensive attach data listing or table)

Summary

Data sources: (organization responsible)

Bureau of economic geology

Data documented: (reference citation)

Data storage location: (specific location)

Univ. of Texas at Austin

Reported Qualifications: (Qualifications or uncertainties included in data document)

NRC Concerns: (Potential NRC concerns for further consideration)

## PRIORITIZATION DATA REVIEW CHECKLIST

1. Name, identification number, and date of document.

Geology and Geohydrology of the East Texas Basin, A Report  
on the Progress of Nuclear Waste Isolation Feasibility ~~Feasibility~~ studies


1a. Is this in draft or final form? (Circle one) (1979) Geol. Circ.  
80-2

1b. Is this ultimately intended for internal DOE/ONWI use or general publication? (Circle one)

1c. Is expected publication date earlier than June 15? YES NO  
If not, can this document be xeroxed and transmitted to NRC at  
this time?  
In part? In total?  
By NRC staff? By DOE/ONWI staff? NA

(This question may need to be answered/verified/authorized  
by DOE/ONWI staff for each document. Therefore you may be directed  
to leave this question blank.)

1d. Proceed to attached sheet.

Bureau of Economic Geol.   
The Univ. of Texas at Austin  
C.W. Kneitter, et al.

Name: William Ford

Date: 5/16/84

Enclosure 2

NRC Rock Mechanics Data Review Worksheets

August 21-24, 1984

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: STANDARD PENETRATION TESTING IN 42 BORINGS  
IN CYPRESS CREEK DOME AREA 1979-1980.

Data Documented: ONWI -165 " GULF COAST SALT DOMES  
SHALLOW BORINGS REPORT, CYPRESS CREEK  
DOME".

Data Collection Location: CYPRESS CREEK DOME AREA, MISSISSIPPI.

(a) Areal Location: T 3N - R 11W, T 3N - R 10W, T 2N - R 11W,  
T 2N - R 10W, WITHIN CYPRESS CREEK DOME AREA.

(b) Subsurface location: MOST BORINGS 100 - 200 FT DEEP,  
SOME AS SHALLOW AS 20 FEET

Method of collection/analyses: ASTM D 1586 - 67 " STANDARD  
METHOD FOR PENETRATION TEST & SPLIT BARREL SAMPLING  
OF SOILS " (SEE NEXT PAGE FOR TEST METHOD UNCERTAINTIES)

Amount of data: STP RESULTS IN 16 BORINGS MADE IN 1979 AND  
26 BORINGS MADE IN 1980.

\*If an item is not applicable to a particular review, write N/A next to  
the item.

Data sources: 42 BORINGS IN SOIL IN CYPRESS CREEK DOME AREA.

Data Interpreted By: DRILL RIG OPERATOR

Data storage location: INFORMATION IS REPORTED IN ONW 1-165.  
BORING LOG BOOK AND NOTES ARE IN ETI, LONG BEACH, CA OFFICES.

Data related uncertainties: IT IS REPORTED IN ONW 1-165 THAT THERE IS A LACK OF CALABRATION OF HAMMER WEIGHT AND OF DROP HEIGHT FOR THE SPT TESTING ACCOMPLISHED IN 16 HOLES THAT WERE PERFORMED IN 1979 (THEY ARE IDENTIFIED AS THE 100 SERIES HOLES). ONW 1-165 RECOMMENDS THAT THE RESULTS OF THIS TESTING IN THE 100 SERIES NOT BE USED FOR ENGINEERING EVALUATIONS.

\*If an item is not applicable to a particular review, write N/A next to the item.

## Salt Repository Project

## Summary Data Inventory Sheet

Type of Data: STANDARD PENETRATION TEST IN 35 SHALLOW BORINGS AT RICHTON DOME AREA IN MISSISSIPPI.

Data Documented: DNNI- 167. " GULF COAST SALT DOME SHALLOW BORINGS REPORT: RICHTON DOME AUGUST 1982.

Data Collection Location: RICHTON DOME AREA MISSISSIPPI

- (a) Areal Location: ROW-TSN, ROW-T4N WITHIN RICHTON DOME AREA MISSISSIPPI.
- (b) Subsurface location: 5 FOOT INTERVALS TO A DEPTH OF 100 FT. Below 100 Feet TESTING WAS PERFORMED IN 10 FOOT INTERVALS (MOST BORINGS WERE DRILLED TO 200' - SOME TO 500')

Method of collection/analyses: ASTM D 1586-67 "STANDARD METHOD FOR PENETRATION TEST AND SPLIT BARREL SAMPLING OF SOILS" 2 INCH O.D. SPLIT SPIN SAMPLER WAS USED.

Amount of data: ALTHOUGH 35 BORINGS WERE REPORTED DNNI-167 (THE COPY AVAILABLE) ONLY PRESENTED 27 BORING LOGS.

\*If an item is not applicable to a particular review, write N/A next to the item.



Data sources: BORINGS WERE DRILLED by LAM ENGINEERING TESTING COMPANY. REPORTED IN ONWI-167. SOME RAW DATA (LOGS) ARE AVAILABLE IN ETI LONG BEACH, CA. OFFICES

Data Interpreted By: DRILL RIG OPERATOR AS REPORTED IN ONWI-167.

Data storage location: ONWI-167 AND SOME LOGS STORED AT ETI LONG BEACH CA OFFICES.

Data related uncertainties: NO UNCERTAINTIES REPORTED.

\*If an item is not applicable to a particular review, write N/A next to the item.

a Brown

# Salt Repository Project

## Summary Data Inventory Sheet

### Type of Data:

IN SITU STRESS - PERMIAN SP-SIN

### Data Documented:

IN SITU STRESS DETERMINATION BY HYDRAULIC  
FRACKING, KOLTZELAN W-1 WELL, 40 LITERS  
N, BARTON, TERRA TECH, JUNE 1980 (DRAFT)

### Data Collection Location:

#### (a) Areal Location:

PERMIAN - KOLTZELAN #1

#### (b) Subsurface location:

VARIABLES - 1950' - 2750'

### Method of collection/analyses:

HYDRAULIC TESTS

### Amount of data:

5 TESTS

\*If an item is not applicable to a particular review, write N/A next to the item.

Data sources:

ABOVE REPORT

Data Interpreted By:

A. KERRICK

REVIEWED BY: J. L. HARRIS  
ILLUSTRATIONS BY: J. L. HARRIS

Data storage location:

SW-1

Data related uncertainties:

NO DATA UNCERTAINTIES

DATA SUMMARY

DEPTH (ft)		ORIENTATION		DEPTH (ft)	LITHOLOGY	(PSI)	
DEPTH	ORIENTATION	OF	OF			REVIEWED	REVIEWED
DEPTH	ORIENTATION	OF	OF	DEPTH	LITHOLOGY	REVIEWED	REVIEWED
0.36	0.00	N 30° E	1350-1358	SILICIOUS	1110	1550	
—	0.00	N 25° E	2330-2338	ANhydrous	—	1700	
1.04	0.05	N 30° E	2430-2438	SALT	2915 x	2715	
1.19	0.05	N 30° E	2530-2538	SALT	3530 x	2815	
6.60	0.05	N 45° E	2730-2738	LIMESTONE	1910	2055	
						* TOTAL	

\*If an item is not applicable to a particular review, write N/A next to the item.

Salt Repository Project

Summary Data Inventory Sheet

Type of Data:

In site Borehole Closure Data from Vacherie Dome  
(on microfilm)

Data Documented:

Borehole Closure in Salt Domes" by E.L. Thoms, M. Hogherrebi  
Data on Tape 55 (1-4085) from ONWI library of LSU  
Turnover Package

Data Collection Location:

(a) Areal Location:

Vacherie Dome

(b) Subsurface location:

Single borehole drilled to depth of ~1524 m in  
Vacherie Dome

Method of collection/analyses:

Borehole closure measured by caliper logging device measuring  
diameter in two directions; by overall volumetric  
closure by monitoring fluid level in borehole w/t time.

Amount of data:

closure data readings over a period of ~1 year - 16 ms.

\*If an item is not applicable to a particular review, write N/A next to  
the item.

Data sources:

Data Interpreted By:

LSU - R.L. Thoms and M. M. Zgherrei

Data storage location:

LSU Record Turnover Package at ONW - Columbia

Data related uncertainties:

How does this field measured creep behavior relate to developed creep models for Gulf Dome salts. What is effect of anhydrites on closure.

It is suggested different initial states of stress around the dome may account for higher closure rates of Vacheie when compared to Rayburn Dome is 20 mi away.

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: Borehole closure for borehole loaded concentrically with curved jacks

Data Documented: Results of an Accelerated Borehole Closure Testing Program at Avery Island; Topical Report RSI-9211 from PEISPEC; CNWI Number to be assigned.

Data Collection Location:

DRAFT REPORT

(a) Areal Location:

(b) Subsurface location:

Avery Island

Method of collection/analyses:

Manual Recording  
Preliminary analysis based on creep law

Amount of data:

Eleven closure curves

\*If an item is not applicable to a particular review, write N/A next to the item.

Data sources: RE/SPEC

Data Interpreted By: RE/SPEC

Data storage location: RE/SPEC

Data related uncertainties:

Large relative errors in initial displacement  
measurements  
limited data on temperature distribution

\*If an item is not applicable to a particular review, write N/A next to the item.

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: Density, steady-state thermal conductivity,  
thermal expansion, specific heat

Data Documented: ONWI Warehouse

Data Collection Location:

(a) Areal Location: Uxehere, Cypress Creek, Palo Duro,  
Salt Valley, Righton, Gibson,

(b) Subsurface location: Holes - depths given in report

Method of collection/analyses:

Amount of data:

\*If an item is not applicable to a particular review, write N/A next to the item.



Data sources: ONWI Records Roll 50284 D.K.  
(Fiber Materials Inc.) Microfilm received  
at ONWI Data Review Meeting 8/21-24/87, (Glimmer  
Data Interpreted By: [Some data as ONWI-522])

Data storage location: ONWI Warehouse

Data related uncertainties:

\*If an item is not applicable to a particular review, write N/A next to the item.

Salt Repository Project

Summary Data Inventory Sheet

Type of Data: - Triaxial Creep Tests  
- Petrofabric studies: fracture patterns, fluid inclusions, dislocations: microphotographs

Data Documented: Deformation Mechanisms of Experimentally Deformed Bedded Salt - Topical Report RSI-0235, Draft PFSPEC to ONWI, ONWI Number to be issued

Data Collection Location:

(a) Areal Location: Ohio

(b) Subsurface location: Salt samples from Cleveland Salt Mine

Method of collection/analyses:

Amount of data: - Ten triaxial creep tests

\*If an item is not applicable to a particular review, write N/A next to the item.

Data sources: RE/SPEC

Data Interpreted By:

Data storage location: RE/SPEC

Data related uncertainties:

\*If an item is not applicable to a particular review, write N/A next to the item.

WMEG AND WMGD DOCUMENT REVIEW SHEET\*

FILE NUMBER: 413.2

DOCUMENT: Nuclear Waste Rep. by Simulation Experiments  
Asse Salt Mine - ERG - Annual Report 1983 Draft

REVIEWER: J. Dorman

DATE REVIEW COMPLETED: 8/29/84

DATE APPROVED:

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

Full Scale In Situ Repository Simulation

BRIEF SUMMARY OF DOCUMENTS:

- Brine Migration Tests
- Strain Measurements
- Room Closure
- Floor Cracking

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

DATA CONTENT

ACTION TAKEN

- Average mineralogical components/water content for 12 samples
- Rock mechanics: ultimate stress; oration stress; shear strength, modulus
- Temperature during heating
- Brine volumes collected in brine migration test
- Borehole gas pressure build up in brine migration
- Room closure data, extensometer readings
- Floor heave data
- Strainmeter calibrations
- Stress measurements

ACTION RECOMMENDED:

Asse and WIPP experiments probably will remain, for the foreseeable future, the main data basis for evaluating salt repository performance.

Needs to be followed very closely and reviewed very critically including acquisition of detailed back up data to the greatest possible extent.

\*If an item is not applicable to a particular review, write N/A next to the item.

Dr. Brown

FILE NUMBER: 413.2

DOCUMENT: IN SITU STRESS DETERMINATION BY FLUID-INDUCED  
FRACTURING, HAZEL CLAY #1 WELL, BLD. D. 304 &  
N. BARTON, TERRA TEX (DR-111) JUNE 1984

REVIEWER: A. Brown

DATE REVIEW COMPLETED: 8/23/84

DATE APPROVED: (WMEG Only)

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

REPORTS ONLY STRESS TESTING TO DATE IN  
HLW PROGRAM IN PERMIAN BASIN. STRESSES  
ARE A KEY VARIABLE IN EVALUATION OF  
PERFORMANCE OF RESERVOIR

BRIEF SUMMARY OF DOCUMENT :

DESCRIBES PROCEDURE & RESULTS OF  
FIVE HYDROGRAPHIC TESTS; ONE IN SOLUTIONS  
ONE IN ANHYDRITE, & THREE IN SALT  
CONCLUDES THAT IN SALT STRESSES ARE  
APPROXIMATELY HORIZONTAL & LITHOSTATIC, WHILE  
IN SOLUTIONS & ANHYDRITE MAJOR PRINCIPAL  
HORIZONTAL STRESS IS ABOUT 0.6-0.7 TIMES  
LITHOSTATIC. MINIMUM PRINCIPAL STRESS DIRECTION  
ARE N30°E IN ROCK, N60°E IN SALT

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

OVERLY ACADEMIC APPROACH CLOUDS ESSENTIAL  
SIGNIFICANCE OF RESULTS.

ACTION TAKEN:

IT IS UNDERSTOOD THAT THIS ORIGINAL REPORT  
IS BEING REINTERPRETED & A NEW

ACTION RECOMMENDED:

NONE

WMEG AND WMGD DOCUMENT REVIEW SHEET\*

FILE NUMBER: 413.2

DOCUMENT: Transient Creep of Repository Rocks - Final Report  
DRAFT - Mechanistic Creep Laws for Rocksalt, by  
J. Handin, N.L. Carter, J.E. Russell, Texas A&M, to ONWI

REVIEWER: J. Daemen ONWI Number to be assigned

DATE REVIEW COMPLETED: 8-22-84

DATE APPROVED:

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

A comprehensive detailed assessment of the adequacy (or inadequacy) of salt creep laws. Very important two-page abstract and 3 1/2 page conclusions deserves widespread attention among people making decisions about salt repository

BRIEF SUMMARY OF DOCUMENTS: Triaxial constant strain-rate creep tests at 100°C to 200°C, confining pressures of 3.4 and 20 MPa. Comparison of results with others. New creep law proposed

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

- comparison with very narrow range of model; why not assess more creep laws?
- limited number of tests (14)
- none of the (admittedly controversial) standard mining engineering rock salt design tests (e.g. Paris Doree) have been mentioned



DATA CONTENT

- Fourteen constant strain rate "creep" tests
- Creep law "constants" for several creep laws and experiments described here as well as in other ONWI reports on Avery Island

ACTION TAKEN

ACTION RECOMMENDED:

- Assess whether proposed law can be used successfully for other tests on Avery Island salt (e.g. accelerated borehole closure tests)
- Assess whether proposed law can be used to describe behavior of other salts

\*If an item is not applicable to a particular review, write N/A next to the item.

WMEG AND WMGD DOCUMENT REVIEW SHEET\*

FILE NUMBER: 413.2

DOCUMENT: ONWI Reports Roll 50284 D.K. (Fiber Materials Inc.)

Microfilm received at ONWI Data Review  
REVIEWER: J. Daemen Meeting 8/21-24/84, Columbus, OH  
DATE REVIEW COMPLETED: 8/22/84

DATE APPROVED:

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

Complete back-up records for BME/ONWI-522

BRIEF SUMMARY OF DOCUMENTS:

Raw data, QA procedures, Test procedures

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

DATA CONTENT

Density, steady-state conductivity, enthalpy,  
specific heat, heat capacity, thermal diffusivity,  
linear thermal expansion - salt : { Vachon dome,  
Cypress Creek, Palo  
Duro, Salt Valley,  
Richlon, Grosndome  
LPomaz

ACTION TAKEN

ACTION RECOMMENDED:

\*If an item is not applicable to a particular review, write N/A next to the item.

WMEG AND WMGD DOCUMENT REVIEW SHEET\*

FILE NUMBER: 413.2

DOCUMENT:

Results of an accelerated boronate closure testing  
DRAFT program at Army Island. Topical Report RSI-0211,  
REISPEC - ONWI Number to be assigned

REVIEWER:

J. Diemen

DATE REVIEW COMPLETED:

8-15-89

DATE APPROVED:

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

Provides experimental data on a different configuration from usual test, thereby providing excellent data to allow checking creep laws.

BRIEF SUMMARY OF DOCUMENTS:

Hollow cylinder loaded externally, heated to induce closure of the central hole

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

Limitations: - low temperature transient data  
- transient temperature data only for slightly elevated temperatures  
- insufficient detail about displacements at failure at joints

DATA CONTENT

Borehole closure data is a function of external pressure, temperature, time.

ACTION TAKEN

ACTION RECOMMENDED:

Use data to assess predictability of borehole closure on the basis of available creep data for Avery Island salt and using various creep models.

WMEG AND WMGT DOCUMENT REVIEW SHEET\*

FILE NUMBER: 413.2

DOCUMENT: Deformation Mechanisms of Experimentally -  
Deformed Bedded Salt. Draft Topical Report  
RSI-0235, REISPEC To ONWI, ONWI Number to be  
assigned.

REVIEWER: J. Dumen

DATE REVIEW COMPLETED: 8-23-84

DATE APPROVED:

SIGNIFICANCE TO NRC WASTE MANAGEMENT PROGRAM:

Fundamental research on salt deformation, preliminary results. Might become of importance if followed up by more comprehensive studies. Explains some of the difficulties in developing creep laws.

BRIEF SUMMARY OF DOCUMENTS:

Petrofabric studies to describe microscopic deformation patterns in rock salt.

Triaxial creep tests on salt ~~with~~ ~~beds~~ with anhydrite stringers / beds.

PROBLEMS, DEFICIENCIES OR LIMITATIONS OF REPORT:

Limitation: salt from Cleveland salt mine

DATA CONTENT

- Petrography and structure before and after experimental deformation
- Ten creep tests: triaxial, constant axial stress, confining stress 5-15 MPa, Temp 25-200 °C

ACTION TAKEN

ACTION RECOMMENDED:

\*If an item is not applicable to a particular review, write N/A next to the item.

Reviewer Roger Hart  
 Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Quasi-Static Elastic & Strength Tests on Vacherie &  
 Richton domes (ONWI-450) - July 1983

- 1a. What is the overall objective of the test?

Determine elastic and strength parameters of  
 salt and non-salt deposits

- 1b. What specific parameters are to be determined by the test?

Elastic constants and unconfined strength and tensile strength of non-salt  
 Elastic constants, exponential Mises-Schleicher criterion parameters &  
 indirect tensile strength. Mises-Schleicher:  $\sqrt{J_2} = K + \alpha \{1 - \exp(-\beta J_1)\}$

- 1c. What criteria were used for test site (or sample) selection?

Not known - For Richton samples supplied by LSCo for salt  
 and by GRTEC for non-salt. For Vacherie samples supplied by LSCo

- 1d. How is the rock at the test site characterized?

Only described by general rock type. Salt is not specifically  
 characterized in this study.

- 1e. How many of these tests have been performed?

For Richton: 6 triaxial tests on salt, 15 uniaxial tests on non-salt  
 For Vacherie: 6 " " " " " " " " " " " " " " " "

- 1f. How many tests are planned?

No more tests are planned at present.

- 1g. Comments.



Reviewer Roger Hart  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form?

*Yes*

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Yes*

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*None noted.*

2d. How are any deviations from the established procedures that occur during testing documented?

*None noted*

2e. Comments.

Reviewer Roger Hart  
Date 5/23/54

3. What instrumentation is used for the test?

3a. How were the reliabilities\* of the instruments specified?

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

*Yes*

3c. Are the calibrations traceable to national or industrial standards?

*Traceable to NBS*

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Ryan Kent  
 Date 2/27/82

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

*lastic constants from uniaxial - reload portion of test.  
 Failure criteria established using 24°C test results  
~~Standard~~ Empirical fit to exponential exponential criterion*

- 4a. How can the raw numerical data be retrieved?

*Data on tape at ReSpec*

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

*Yes*

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

*No*

- 4d. Comments.

Reviewer Ray Hunt  
Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

*Not stated*

5a. Were these criteria established prior to test development?

*Not stated*

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

° Review Procedure

° Corrective Action

Reviewer Ron Hart  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

*Electric & Strength results are simply listed in tabular form. No attempt made to establish relationship among different tests. Only mention is to strengths being nearly identical at Vaederie and Reithan.*

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Reviewer Rome Hart  
 Date 8/22/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Salt Creep Tests for Vacherie & Richton domes (ONWI-450)  
 — July 1983

- 1a. What is the overall objective of the test?

Develop <sup>preliminary</sup> creep parameters for salt dome deposits.  
 Parameters picked to fit form of creep law selected  
 by Re/Spec. [Exponential-time creep law.]  
 Form of creep law defined to include ~~reach~~ reach steady state.

- 1b. What specific parameters are to be determined by the test?

creep law:  $\epsilon_c = \dot{\epsilon}_{ss} t + \epsilon_0 \{1 - \exp(-ft)\}$  Empirical law  
 $\dot{\epsilon}_{ss} = A \sigma^n \exp(-Q/RT)$

parameters determined:  $A, n, Q/R$  ~~constant~~

Creep tests performed over period of one month

- 1c. What criteria were used for test site (or sample) selection?

Not known - samples for Richton supplied by LETCO,  
 samples for Vacherie supplied by LSU.

- 1d. How is the rock at the test site characterized?

Rock characterized by Let Co. & LSU I assume - ~~don't~~  
~~know~~ ~~have~~ No record of how only described ~~the~~ general rock

- 1e. How many of these tests have been performed?

~~Two~~ Three tests on Richton & Three on ~~any~~ Vacherie type

- 1f. How many tests are planned?

No more tests are planned at present

- 1g. Comments.

~~Only the tests~~  
 Creep tests at 100°C & 200°C  
 and at 5 MPa and 10 MPa deviatoric stress  
 (15 MPa confining press.)  
 Constant stress rate test.

I don't believe the results from these tests can be  
 considered sufficient to describe creep behavior of dome salts.

Reviewer Ryan Hart  
 Date 8/22/84

2. Is the procedure documented and complete, and is it in written form?

*creep test internally documented by Re/Spec.  
 Report - TP 046 - Quasi-static & Creep Triaxial Test*

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Non-Standard*

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Internal developments currently being revised.  
~~ASTM D1555 - 1974~~*

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*1st revision - Aug 1984*

- 2d. How are any deviations from the established procedures that occur during testing documented?

*No Deviation in test procedure documented  
 in reports (none documented for these tests)*

- 2e. Comments.

Reviewer Roger Hart  
 Date 8/22/84

3. What instrumentation is used for the test? (~~see~~)

*instrumentation described on page 22 (DMM-450)*

3a. How were the reliabilities\* of the instruments specified?  
*stress manually adjusted (computer control recently)*

*not defined.*

*this is a difficult question for long-term tests.  
 Equipment calibrated before & after tests*

3b. Is there a calibration system or were calibrations systematically carried out according to approved procedure?

*load cells - complete system calibrated before - after each test*

3c. Are the calibrations traceable to national or industrial standards?

*Traceable to NBS*

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



Reviewer Zorn Hart  
 Date 8/20/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

~~straight line~~ fitting to data (2 points at 2 different stress levels, 2 different temp.)  
 data collected on cassette tape

- 4a. How can the raw numerical data be retrieved?

Data on cassette tape have been transferred to mag. tape  
 & are stored in engr. units.  
 Calibration constants in Ref/spec Q. A. system

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

Test results (strain/time) presented in appendix

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

~~No~~ No - no attempt made to interpret creep in terms of affecting conditions

- 4d. Comments.

Deformation data are collected either at specified deformation interval or time interval (1 hr), whichever comes first.

Reviewer Zoe Hart  
Date 8/22/84

5. What are the acceptance/rejection criteria for the test data?

*only based on equipment failure, such as  
data acquisition system.*

5a. Were these criteria established prior to test development?

No criteria  
*isolated data points thrown out based on experimenter's  
perception*

5b. How are the criteria implemented? (Data handling, review procedure,  
corrective action.)

~~Engr.~~ *Engr. running test picks out data.  
Reviewed by Paul Senseney*

° Data Handling

° Review Procedure

° Corrective Action

Reviewer Roger Hart  
 Date 8/22/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

*No correlation to index properties.*

*It is not clear what the condition of the samples were at testing - how long out of the hole, how disturbed, moisture change.*

*There is no correlation between data or between results from other sites other than showing curves on one plot.*

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

*Actual data was not reviewed. Data on tapes in engr. units at Re Spec. I don't think review of this data is ~~warranted~~ since there is so little.*

Reviewer J. Dacner  
Date 8-24-84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

*Specific Heat Measurement*

- 1a. What is the overall objective of the test?
- 1b. What specific parameters are to be determined by the test?
- 1c. What criteria were used for test site (or sample) selection?
- 1d. How is the rock at the test site characterized?
- 1e. How many of these tests have been performed?
- 1f. How many tests are planned?
- 1g. Comments.

Reviewer J. J. Jones  
Date 3-24-89

2. Is the procedure documented and complete, and is it in written form?

yes ONWI-522, Appendix B

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

ASTM D-2766 + modifications/  
refinements

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

- 2d. How are any deviations from the established procedures that occur during testing documented?

- 2e. Comments.

Reviewer Daemen  
Date 8-24-81

3. What instrumentation is used for the test?

*Electric Heater/Calorimeter*

3a. How were the reliabilities\* of the instruments specified?

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

*yes*

3c. Are the calibrations traceable to national or industrial standards?

*yes NBS*

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Daemen  
Date 5-24-84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

- 4a. How can the raw numerical data be retrieved?

Roll 50284 D.K. (Fiber Materials Inc.),  
ONW-I Microfilm

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

- 4d. Comments.

ReviewerDate

5. What are the acceptance/rejection criteria for the test data?

5a. Were these criteria established prior to test development?

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

- ° Data Handling

- ° Review Procedure

- ° Corrective Action



6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).
7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Reviewer J. J. J. J. J.  
 Date 8-22-84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

*Thermal Expansion*

- 1a. What is the overall objective of the test?

*Determine linear thermal expansion*

- 1b. What specific parameters are to be determined by the test?

*Coefficient of linear thermal expansion as a function of temperature*

- 1c. What criteria were used for test site (or sample) selection?

*Some samples rejected because no acceptable size samples could be prepared*

- 1d. How is the rock at the test site characterized?

*Salt or caprock*

- 1e. How many of these tests have been performed?

*5 for Uchiro's Dome, 4 for Cypress Creek Dome  
 10 for Ricketts Dome*

- 1f. How many tests are planned?

*None - contract finished*

- 1g. Comments.

*Data reported in ONW-I-522  
 All data is in Records Turnover Package,  
 Complete microfilm record at ONW-I.*

Reviewer Darmon  
Date 8-22-74

2. Is the procedure documented and complete, and is it in written form?

yes, Appendix A, CAL I 522

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

ASTM Specification E-218, with a number of refinements

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

No

- 2d. How are any deviations from the established procedures that occur during testing documented?

- 2e. Comments.

Reviewer J. D. Jensen  
 Date 8-22-74

3. What instrumentation is used for the test?

Orlon Recording Quartz Dilatometer	Temperature - Measurements Instrument
Micrometer Calipers	
Electro. Furnace	
Liquid Baths	

3a. How were the reliabilities\* of the instruments specified?

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

yes

3c. Are the calibrations traceable to national or industrial standards?

yes - NBS

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer J. D. Jemen  
Date 8-27-89

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

*Plot of thermal expansion vs. time*

- 4a. How can the raw numerical data be retrieved?

*Microfilm*

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

*yes*

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

*yes - Hole, depth given*

- 4d. Comments.

Reviewer J. Daemen  
Date 8-24-84

5. What are the acceptance/rejection criteria for the test data?

*No*

5a. Were these criteria established prior to test development?

*No - qualified operator is called for in procedures*

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

- ° Data Handling
- ° Review Procedure
- ° Corrective Action

Reviewer J. Daemen  
Date 8-24-84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

*Several tests repeated*

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

*Nine - complete microfilm copy has been provided for NRC use.*

Reviewer J. D. Dumen  
 Date 2-22-84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

*Thermal Conductivity - April 1979 through July, 1981*

- 1a. What is the overall objective of the test?

*Measurement of thermal conductivity*

- 1b. What specific parameters are to be determined by the test?

*Thermal conductivity as a function of temperature*

- 1c. What criteria were used for test site (or sample) selection?

*Three salt, one caprock - ~~about~~ 1 ft 10 in, per letter from Patchick, ONWI, to Martinez; May 21, 1979 -*

- 1d. How is the rock at the test site characterized?

*Salt or caprock*

- 1e. How many of these tests have been performed?

*6 for Vachevie dome, 4 for Cypress Creek dome,  
 8 for Palo Duro, 5 for Salt Valley, Utah, 9 for Pickett  
 Contact Completed } 12 for Gibson dome*

- 1g. Comments.



Reviewer J. D. Jones  
Date 8

2. Is the procedure documented and complete, and is it in written form?

Yes, ONWI - 522, Appendix C

Roll 50284 D.K. (Fibers Materials Inc.), ONWI Microfilm

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

ASTM C-518

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

yes, ONWI - 522, p. 62, added second  
neck flow meter

- 2d. How are any deviations from the established procedures that occur during testing documented?

Dev noted in ONWI - 522  
Not found in Roll 50284 I. h.

- 2e. Comments.

Reviewer D. J. J. J.  
Date 8-22-84

3. What instrumentation is used for the test?

Heat source, Heat-flow meter, Heat Sink  
+ power supplies, coolants, thermocouples, vacuum chambers,  
recorders, etc.

- 3a. How were the reliabilities\* of the instruments specified?

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

Described in Appendix C, section 6., ONWI-522

- 3c. Are the calibrations traceable to national or industrial standards?

NBS, ANSI

- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Damen  
 Date 8-22-89

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

*Tabulate, plot, fit curve*

$$\lambda = \frac{q}{A} \cdot \frac{x}{\Delta T}$$

- 4a. How can the raw numerical data be retrieved?

*Microfilm and hard originals in ONWI warehouse*

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

*yes*

- 4c. Are the data related to geological, environmental, and other experimental conditions?

*hole, depth given from which sample is taken*

- 4d. Comments.

Reviewer Daemen  
Date 8-22-84

5. What are the acceptance/rejection criteria for the test data?

5a. Were these criteria established prior to test development?

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

*Qualifies in last part of Experimental Procedure*

- ° Data Handling
- ° Review Procedure
- ° Corrective Action

Reviewer Dacmon  
Date 8-22-84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

Repeated two tests after adding redundant instrumentation - repeated very well

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

None reported

Complete description of Records Turnover Package has been provided for NRC use.

Reviewer B. J. J. J. J.  
 Date 8-22-84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
 Triaxial comp creep tests — Salt specimens from Woods-Holtselaw well in Palo Duro Basin, Samples selected by ONRI, Texas Bureau of Economic Geology, & SWEC. Samples from Unit 4 and Unit 5 of the Lower San Andreas Formation.
- 1a. What is the overall objective of the test?  
 To assess the influence of impurity content on creep deformation.
- 1b. What specific parameters are to be determined by the test?  
 Creep data: Strain vs time data fitted to exponential-time creep law. Fitting parameters were used to evaluate the effect of the <sup>sample</sup> impurity on creep deformation of samples.
- 1c. What criteria were used for test site (or sample) selection?  
 Samples selected on the basis of estimated impurity level. 3 samples each of: Salt, salt with 10% anhydrite, salt with 10 percent mud, and salt with 20 percent mud.
- 1d. How is the rock at the test site characterized?  
 Samples from salt portion of core. (100 mm dia) Sample size (200 mm long)
- 1e. How many of these tests have been performed?  
 Depth 2450 ft - 2550 ft
- 1f. How many tests are planned?  
 12
- 1g. Comments.  
 12 tests completed, Inconclusive results

Source: Influence of Impurities on the Creep of Salt Formations in the Palo Duro Basin, Technical Paper R51-0279  
 Paul E. Senneker, Thomas P. Fiala, July 84,  
 REISPEC Inc.  
 P.O. Box 725, Fort Collins, CO, 80521

not published yet

Temp 75°  $(\sigma_1 - \sigma_3) = 15 \text{ mpa}$   $T = 3 \times 10^5 \text{ s. (35 days)}$   
Test environment close to that in the Repository Rooms.  
2

Reviewer B.J.  
Date 8-22-84

2. Is the procedure documented and complete, and is it in written form?

Yes,

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

No, But developed and used for Creep tests reported in other reports.

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

2d. How are any deviations from the established procedures that occur during testing documented?

No

2e. Comments.

Acceptable procedure.

Reviewer B. J.  
Date 8-22-62

3. What instrumentation is used for the test?  
Triaxial load frame designed by DR W.R. Nawrocki of Sandia  
National Lab. (Documented in publication by ONW-250)
- 3a. How were the reliabilities\* of the instruments specified?  
Not specified as per the definition below
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?  
Yes.
- 3c. Are the calibrations traceable to national or industrial standards?  
Yes. - to National Bureau of Standards
- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



ReviewerDate

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

Computerized, Digital Read Out.

- 4a. How can the raw numerical data be retrieved?

Yes, at RE/SPEC. facility. Data has not yet been turned over to Battelle.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

Yes., standard presentation.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

Yes.; experimental conditions are mentioned. Specimen identification gives the sample its exact depth in the boring.

- 4d. Comments.

Data presentation is acceptable

ReviewerDate

5. What are the acceptance/rejection criteria for the test data?

Successful completion at the end of 35 days. Test stopped after 4 days because of leak. Test duration (35 days) is not long enough, but provides a basis for evaluating the effect of impurities.

- 5a. Were these criteria established prior to test development?

yes. - Running the test for 35 days. Data monitored automatically (computer monitoring)

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

° Review Procedure

° Corrective Action      N A

Reviewer B. Jagannath  
Date 8/22/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The program has limited scope and with in the tested condition the variation in creep parameters for samples of identical impurity was of the same order of magnitude as the variation in creep parameters between samples of different impurities. The hypothesis that there is no difference in creep deformation caused by impurity content can be rejected with only about 50 percent confidence.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

None.

Reviewer R. Cummings  
Date 24 AUG 84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
Thermophysical properties on Permian Basin salt  
(conductivity, diffusivity, coefficient of linear expansion)  
UCLR-numbered reports (LLL) vary confining stress.
- 1a. What is the overall objective of the test?  
Measurement of (preliminary) thermophysical properties  
for conceptual thermomechanical modeling of salt  
repositories; development of experimental methodologies.
- 1b. What specific parameters are to be determined by the test?  
Thermal conductivity, thermal diffusivity, coefficient  
of linear thermal expansion; Specific heat is cal-  
culated from the other data.
- 1c. What criteria were used for test site (or sample) selection?  
Unknown--samples were shipped to labs from  
various sources.
- 1d. How is the rock at the test site characterized?  
Geophysical/geological logs; in some cases,  
correlative petrographic analyses, core photographs,
- 1e. How many of these tests have been performed? or point load tests exist.  
13
- 1f. How many tests are planned?  
Unknown
- 1g. Comments.  
Data sources are ONWI-522 and UCLR-53476

Reviewer R. CUMMINGS  
Date 24 AUG 84

2. Is the procedure documented and complete, and is it in written form

*Not all procedures are thoroughly documented.  
Procedures in CWVI-522 are included as appendices*

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*No*

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Procedures for measurements at pressure and temperature are in development. Measurement techniques such as steady-state conventional methods are internally-approved.*

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*No specific information available*

- 2d. How are any deviations from the established procedures that occur during testing documented?

*Mention of major deviations are identified in the reports. Minor deviations are presumably identified in data sheets, but this is unknown.*

- 2e. Comments.

*It should be remembered that these procedures are largely developmental.*

Reviewer R. CUMMINGS  
Date 24 AUG 84

3. What instrumentation is used for the test?  
Thermocouples, resistance-wire heaters, pressure transducers, LVDTs, pressure cells, and servo systems are used for the measurements under confinement. Techniques relative to ONWI-522 have been reviewed by J. Daemen
- 3a. How were the reliabilities\* of the instruments specified?  
Calibration against Pyroceram - 9606 roughly indicates reliability. No ~~to~~ apparent formal reliability assessment.
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?  
yes - against Pyroceram 9606
- 3c. Are the calibrations traceable to national or industrial standards?  
yes
- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer R. CUMMINGS  
Date 24 AUG 84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

Data from the pressure tests are collected and plotted automatically.

Data from ONWI-522 may be hand-collected for some data types.

- 4a. How can the raw numerical data be retrieved?

Play the tapes back.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

yes -- as plots vs. temperature and pressure

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

ONWI-522, yes.

UCRL-53476

- 4d. Comments.

Reviewer R. CUMMINGS  
Date 24 AUG 84

5. What are the acceptance/rejection criteria for the test data?

*OMW-522 -- see review by Daemen.*

*NCRL-53476 -- All data are reported.*

- 5a. Were these criteria established prior to test development?

*N/A*

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

*N/A*

- ° Data Handling
- ° Review Procedure
- ° Corrective Action



Reviewer R. Cummings  
Date 24 AUG 84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

*No standardized method of measuring site-specific thermophysical properties has apparently been established. Methods of specimen selection, preparation, and properties measurement seem to still be largely developmental. Care should be taken in comparing or using these preliminary data. Some methods, for example, measure properties in a radial direction; others axial.*

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

*Specimen handling and preparation documentation relating to the somewhat lengthy and rigorous process of preparation, would be desirable. Also, post-test analyses (such as petrographic, petrofabric, microstructure, and spectrographic, as well as density and moisture content) would be useful to assess variability in results.*

Reviewer R. CUMMINGS  
 Date 23 AUG 84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
*Triaxial constant stress-rate tests. Various dates, testing laboratories. (and constant strain-rate)*  
 RE/SPEC: constant stress-rate. A.R.A.: Constant strain-rate
- 1a. What is the overall objective of the test?  
*Determination of linear and nonlinear failure envelopes and elastic properties. Elevated temperatures may be incorporated (RE/SPEC only)*
- 1b. What specific parameters are to be determined by the test?  
*compressive strength (at various levels of confinement) elastic modulus, Poisson's ratio, derived nonlinear and linear failure envelopes. In addition, A.R.A. determines moisture content, density, and sonic velocities/dynamic elastic properties during their tests.*
- 1c. What criteria were used for test site (or sample) selection?  
*RE/SPEC uses tests for input parameters for creep law determination; thus avoid anomalous core components. A.R.A. samples (pulled from core by SWEC) are for index testing and are more comprehensive. Core is selected visually.*
- 1d. How is the rock at the test site characterized?  
*Geological/geophysical logs; occasionally point-load tests or petrographic studies may be correlative if ordered by SWEC for all tests.*
- 1e. How many of these tests have been performed?  
*From Permian, 36 by RE/SPEC (RSI-0221); ONWI-450; ONWI-314) and 34 (O-1261) by SWEC (A.R.A.) SW*
- 1f. How many tests are planned?  
*SWEC tests are ongoing.*
- 1g. Comments.  
*Numbers of tests are uncertain because of need to include unreleased, unanalyzed data by GPMs.*

Reviewer R. Cummings  
 Date 23 AUG 84

2. Is the procedure documented and complete, and is it in written for  
*labs do have written procedures.*

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Procedures vary from lab to lab in specimen handling, test set-up, and test procedure details.*

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Procedures were developed at individual labs and are the results of evolutionary processes. Methods of strain measurement have changed*

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*RE/SPEC underwent formal revision summer 1984 to allow for computer-control of load. A.R.H. began using deformation ring (formerly strain gages) in November 1983. There may have been changes at greater levels of detail. Procedural changes apparently receive internal (within the lab) review.*

2d. How are any deviations from the established procedures that occur during testing documented?

*Noted on testing records. Reports make no special mention of deviated data.*

2e. Comments.

*Much of the information reviewed has not been formally accepted by ONWI. These reports exhibit substantial and probably significant differences in key procedure elements between labs.*

Reviewer R. CUMMINGS  
 Date 23 AUG 84

3. What instrumentation is used for the test? dilatometer,  
*Instrumentation has varied. At one time or another, instruments have included LVDTs, pressure transducers, strain gages, signal conditioners, and load cells. Data collection is also automatic.*

- 3a. How were the reliabilities\* of the instruments specified?

*No formal process.*

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

*Equipment is calibrated between each series of tests. Reports are sketchy as to the comprehensiveness of the calibrations in some cases.*

- 3c. Are the calibrations traceable to national or industrial standards?

*Unclear from these preliminary reports.*

- 3d. Comments.

*Earlier RE/SPEC tests determined lateral strain through a dilatometer measuring fluid volume changes within the cell. It was assumed that the specimen remained cylindrical throughout the test. Corrections were applied through calibration with steel, brass, and copper standards to establish machine stiffnesses.*

- \* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

*Later RE/SPEC tests use a deformation jacket wholly contained within the cell.*

Reviewer R. CUMMINGS  
 Date 23 AUG 84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

*Specimen deformability is measured with a deformation jacket arrangement (present practice) the nature of which varies from lab to lab. Data are collected, calibration constants applied, and plots are generated automatically. Data collection intervals vary.*

- 4a. How can the raw numerical data be retrieved?

*Playback of tapes or discs.*

- 4b. Are the data presented in a complete and clear format? (Comment also on the utility of the presentation.)

*Data are given in standard stress-strain, strain-strain, etc., graphs.*

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

*SWEC data are keyed to moisture content, density, and sonic velocity. RE/SPEC data are traceable to geologic logs but no specific correlations are given to the data in either case.*

- 4d. Comments.

*Labs report ~~some~~ pure testing results.*

Reviewer R. Cummings  
Date 23 AUG 84

5. What are the acceptance/rejection criteria for the test data?

*Spurious data points on these tests are rare. None were noted during spot checks. Those that do occur are rejected/accepted under the judgement of the analyst.*

- 5a. Were these criteria established prior to test development?

*N/A*

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

*Spurious data may not be explainable. Obviously strange data points are not included in the derivation of the various properties.*

° Review Procedure

*Reports are reviewed by subcontractor management.*

° Corrective Action

Reviewer R. CUMMINGS  
Date 23 AUG 84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

Reports reviewed, which are preliminary, do not in several cases provide sufficient info to evaluate the significance of variations in procedures between labs. It is possible that these differences could introduce significant, systematic variations in properties ~~that~~ as measured by different labs. This situation needs to be resolved through standardization of the entire specimen retrieval, handling, and testing process.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Recommend that the formation average properties be assessed for each lab's findings to see if any systematic errors can be related to non-geologic influences. This can be done with data released through normal channels. However, actual lab data sheets may be required to establish procedures in sufficient detail for a full evaluation.

Reviewer K. CUMMINGS  
 Date 22 AUGUST 84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
*Constant-stress, triaxial compression on salt from Salt Cycle 5, Permian Basin. (Creep tests)*
- 1a. What is the overall objective of the test?  
*Development of exponential constitutive laws -- determination of creep-law parameters -- to support design and siting activities in the reference horizon.*
- 1b. What specific parameters are to be determined by the test?  
 *$A, n, Q/R, \dot{\epsilon}_{ss}^*, \epsilon_a, B, \beta, \epsilon$ , at temperatures of 20°C-200°C, confining pressures uniform @ 15 MPa.*
- 1c. What criteria were used for test site (or sample) selection?  
*Attempts to characterize major lithologies with the objective of reproducibility of data, since regression analysis is used to define creep laws. Visual specimen selection.*
- 1d. How is the rock at the test site characterized?  
*Geologic logs, geophysical logs, systematic point load testing, done by others.*
- 1e. How many of these tests have been performed?  
*30 on Permian Basin (15 on Cycle 5, 15 on Cycle 4)  
 RSI-221, RSI-252, ONWI-450.*
- 1f. How many tests are planned?  
*Unknown -- depends on site selection decision. No further tests of this type are planned prior to site characterization.*
- 1g. Comments.  
*Specimen selection is careful to avoid apparently anomalous layers (see 1.c. above for purpose of tests), as contrasted with index testing*



Reviewer R. CUMMINGS  
Date 22 AUGUST 1984

2. Is the procedure documented and complete, and is it in written form  
*TDP-04 B*, now a controlled document.

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Non-standard*

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Evolved since mid-1970's under supervision of senior management.*

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*1 revision, signed by P. Senseny, summer 1984*

*Tests were run under Revision 0.*

*Revision incorporated computer control of tests.*

*Test control prior to this was manual*

2d. How are any deviations from the established procedures that occur during testing documented?

*Documentation appears in the testing reports*

2e. Comments.

Reviewer R. Cummings  
 Date 22 AUG 84

3. What instrumentation is used for the test? *electronic controls, dilatometers, Load cells, LVDTs, thermocouples, pressure transducers, Triaxial cells custom-built to Re/Spec specs. Loading frames custom built also. Axial load since early 1983 has been controlled by PDP 11/23 computer.*
- 3a. How were the reliabilities\* of the instruments specified? *computer. Reliabilities are assessed through repetitive measurements and by examining calibration data before & after tests.*
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure? *Calibration of load- and displacement-sensing equipment before and after each creep test. System calibration is carried out on assembled system*
- 3c. Are the calibrations traceable to national or industrial standards? *All to NBS*
- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer R. CUMMINGS  
Date 8/22/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

Data are digitized onto disc. Data reduction are by regression analysis/curve fitting. Data collection intervals are automatic, based on either deformation or time limits.

- 4a. How can the raw numerical data be retrieved?

Numerical data are stored as bits; calibration constants are also formatted onto the tapes. Retrieval requires tape playback knowing the format of the tape.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

All reports contain complete stress-strain, strain-time, etc., plots in appendices. Supporting geological sample descriptions, etc. are stored in hard-copy QA file at Ke/Spec

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

Specimens are examined geologically but the regressions run do not allow for geological conditions. Only pure data are presented.

- 4d. Comments.

Other efforts are targeted at explaining specimen behavior based on geological and experimental conditions.

5. What are the acceptance/rejection criteria for the test data?

Data clearly related to equipment failure or DAS failure are rejected. Other spurious data are rare but ~~are~~ the rejection of these are really at the discretion of the analyst.

- 5a. Were these criteria established prior to test development?

N/A

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

Any rejection of data ~~are~~ are done by engineers and are reflected in plotted data; all data are contained in raw data files.

° Review Procedure

All plots are reviewed by senior management / report authors

° Corrective Action

Most of the rejected data are limited to "glitches" that are clearly out-of-line. These data are simply left off the plots.

Reviewer R. CUMMINGS  
Date 22 AUG 84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

Test results are compared w/ each other through regression analyses. Correlations w/ other tests may or may not be made, by others. There are also constant stress-rate tests (on salt, for  $E$  &  $\nu$ ) and constant strain-rate tests on non-salt rocks. Test duration ranges from 1 to 6 mo. LVDTs in latter tests (post-ONWI 450) are more accurate since

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Optionally, details of the specimens tested and raw data may be desirable for correlation and extrapolation of results.

Permian Basin  
Palo Duro

1

Reviewer Peschel / Mundell  
Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test. *Cored 9/24/82  
Core run #36*  
*Splitting tensile strength (Brazilian), No. 1 Better Well, 2665.0 (ft),  
date of lab. test is on data sheet on file with SWEC  
date of the core recovery is in Well completion report with ONWI*
- 1a. What is the overall objective of the test?  
*add to the data base ~~(and correlation with geophysical logs)~~*
- 1b. What specific parameters are to be determined by the test?  
*splitting tensile strength, bulk density*
- 1c. What criteria were used for test site (or sample) selection?  
*1. Lithologic unit of interest  
2. Sample reasonably homogeneous*
- 1d. How is the rock at the test site characterized?  
*core logs, core photographs, post test petrographic description*
- 1e. How many of these tests have been performed?  
*approx 60*
- 1f. How many tests are planned?  
*approx. 40*
- 1g. Comments.  
*Cote is obtained and logged by SWEC, sealed in plastic bags, shipped to TBEG in Austin, samples are selected in Austin and shipped to SWEC in Boston for testing.  
Summary report on testing in each well is planned to be issued in FY 85*

Reviewer P. Schell / Mundell  
Date 8/23/04

2. Is the procedure documented and complete, and is it in written form?

yes

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

yes - COE RTH 113 with variation as described in writing in report and in procedures.

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

SWEC technical procedure reviewed with accordance with QA program

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

N/A

2d. How are any deviations from the established procedures that occur during testing documented?

in nonconformance and disposition reports also detailed notes and comments follow the test

2e. Comments.

Reviewer P. J. / Mandell  
Date 2/25/84

3. What instrumentation is used for the test?

the 60,000 lbs testing machine and accessories  
detailed specifications are on file with SWEC

- 3a. How were the reliabilities\* of the instruments specified?

N/A

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

yes - calibration procedure on file with SWEC, it is  
with compliance with 10 CFR 50 Appendix B, regularly  
audited by USNRC and ONW1.

- 3c. Are the calibrations traceable to national or industrial standards?

yes (NBS)

- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

visual readout and recording on data sheet including calculations

- 4a. How can the raw numerical data be retrieved?

data is on SWEC data sheets on file with SWEC  
(at this time)

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

yes - clear tables and descriptions

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

sample locations allow tracing to geological conditions  
through the well completion reports

however, the moisture content is documented at the  
time of the test but no method has been devised  
yet to determine moisture content in situ

- 4d. Comments.

Reviewer Richard Mundell  
 Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

All tests which were performed are included in data storage; the cotes which were broken during shipping are not used; written procedures include strict calibration checks and procedures for identifying and

5a. Were these criteria established prior to test development? correcting errors

yes

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

in accordance with SWFC procedures (data signed, reviewed and checked)

° Review Procedure

all the final reports are reviewed internally, including independent QA review (technical review)

° Corrective Action

written procedures for corrective actions

Reviewer P. Shyl / Mundell  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

These laboratory tests provide detailed information on the properties of small sample from a specific location. They do not provide in situ properties directly.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

This laboratory test report is supplemented by the corresponding well completion report:  
BMI / SRP 5008 Detten No. 1 (by SWE C)

Permian Basin

Palo Duro

1

Reviewer Mundell / Peshel  
Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Triaxial test at 2000 PSI confining pressure, No 1. Dotter (SWEC)  
2673.1 (ft), Lower San Andres, Unit #4 (salt), tested 8/14/83

- 1a. What is the overall objective of the test?

Triaxial test at 2000 PSI confining pressure, strain to failure,  
fracture strength (continued), Poisson's ratio, Young's modulus,  
dynamic modulus. In general, to add to data base of  
elastic rock properties data at potential repository site.

- 1b. What specific parameters are to be determined by the test?

the above plus water content, density, velocity (ies)

- 1c. What criteria were used for test site (or sample) selection?

1. lithologic unit of interest
2. Sample reasonably homogeneous

- 1d. How is the rock at the test site characterized?

core logs, core photographs, post test petrographic description

- 1e. How many of these tests have been performed?

Approximately 100

- 1f. How many tests are planned?

approx. 50 more

- 1g. Comments.

Core is obtained and logged by Stone & Webster, sealed  
in plastic bags, shipped to TBEG in Austin, samples  
are selected in Austin and shipped to various labs  
by TBEG in this case tested by Applied Research Ass.  
in Vermont.  
Summary report on testing in each well is planned to be  
submitted in EIR

Reviewer Mundell / Rachel  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form

*yes*

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Engineering Service Scope of Work (ESSOW) No. 13697-G 1101  
It follows standard ASTM procedure with some differences  
as specified in writing*

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Stouff & Webster document: basis for contractors  
procedure which is reviewed, approved and which  
controls the work*

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*There have been revisions approved through the  
same process*

- 2d. How are any deviations from the established procedures that occur during testing documented?

*in nonconformance and disposition reports  
also detailed notes and comments follow the test*

- 2e. Comments.

Reviewer

Date

Mundell / Pshel  
2/23/84

3. What instrumentation is used for the test?

Listed in detail in the Laboratory testing report Volume 6,  
2/7/84 by ARA

- 3a. How were the reliabilities\* of the instruments specified?

redundancy of the instrumentation is built in system

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

Written calibration procedure approved by Stone & Webster  
in compliance with 10 CFR 50 Appendix B  
Audited by Stone & Webster

- 3c. Are the calibrations traceable to national or industrial standards?

yes (NBS)

- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Mundell / Rishel  
 Date 8/23/94

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

numerical using Apple computer as described in the ARA report

- 4a. How can the raw numerical data be retrieved?

plots are in the ARA reports  
 numerical data on floppy discs at ARA

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

yes - the graphs are in clear and informative form

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

in the future the data will be keyed to Geotechnical log by SWEF

however, the moisture content is documented at the time of test but no method has been devised to determine moisture content in situ

- 4d. Comments.

Reviewer Mondell / Poshel  
 Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

all tests which were performed are included in data storage; the cotes which broke during shipment were not used; written procedures included

5a. Were these criteria established prior to test development?

yes

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

Written procedures include strict calibration checks and procedures for identifying and correcting errors

◦ Data Handling

in accordance with contractors procedures (data signed, reviewed and checked)

◦ Review Procedure

the contractors draft report is reviewed by SWEC  
 the final report by ARA is reviewed and accepted by SWEC

◦ Corrective Action

Written procedures for corrective actions



Reviewer Mundell/Resnik  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The laboratory tests provide detailed information on the properties of a small sample from a specific location. They do not provide in site properties directly.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

This laboratory test report <sup>is</sup> ~~should be~~ supplemented by the corresponding well completion report BMI/SRP 5008 Detten No.1 (by SWEC).

The reports for each well are provided by SWEC to ONWI.

Permian Basin  
PALO DURO

1

Reviewer JOHN PESHEL / L. Mundell  
Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Unconfined compression and dynamic modulus December 20, 1983  
Zack 2989.5 (ft) to the top of the specimen, Sept. 30, 1983  
Core was recovered MAY 22, 1982

- 1a. What is the overall objective of the test?

Unconfined compressive strength, static modulus,  
dynamic modulus  
in general, to gather information\* on potential repository site  
\* Data base - elastic properties

- 1b. What specific parameters are to be determined by the test?

plus bulk density and water content as addition to above

- 1c. What criteria were used for test site (or sample) selection?

1. Lithologic unit of interest  
2. Sample reasonably homogeneous

- 1d. How is the rock at the test site characterized?

core logs, core photographs, post test petrographic description

- 1e. How many of these tests have been performed?

approximately 70

- 1f. How many tests are planned?

approximately 30 more

- 1g. Comments.

Summary report on testing in each well is planned  
to be issued in FY 85

Core is obtained and logged by Stone & Webster, sealed in  
plastic bags, shipped to TBEG in Austin, samples  
are selected in Austin and shipped to various labs by TBEG  
in this case tested by Applied Research Ass. in Vermont

Reviewer P. S. L. / Mondell  
 Date 8/28/84

2. Is the procedure documented and complete, and is it in written form?

*yes*

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*Engineering Service Scope of Work (ESSOW) No. 13697-G110D  
 It follows standard ASTM procedure with some differences as specified in writing.*

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Stone & Webster document: basis for contractor procedure which is reviewed, approved and controls the work*

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*There have been revisions approved through the same process  
 Also detailed notes as*

- 2d. How are any deviations from the established procedures that occur during testing documented?

*in Nonconformance and disposition reports  
 also detailed notes and comments follow the test*

- 2e. Comments.

Reviewer Peschel / Mondell  
Date 8/22/82

3. What instrumentation is used for the test?  
*listed in detail in the Laboratory testing report Volume 7, 4/4/1981  
by Applied Research Associates*
- 3a. How were the reliabilities\* of the instruments specified?  
*redundancy of the instrumentation is built in the system*
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?  
*Written calibration procedure approved by Stone & Webster  
in compliance with 10 CFR 50 Appendix B  
audited by Stone Webster*
- 3c. Are the calibrations traceable to national or industrial standards?  
*yes (NBS)*
- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Peshel / Mondell  
 Date 8/23/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

numerical using Apple computer as described in the ARA report

- 4a. How can the raw numerical data be retrieved?

plots are in the ARA reports

numerical data on floppy discs at ARA

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

yes - the graphs are in clear and informative form

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

yes - the data are keyed to Geotechnical log by SWEC <sup>at the time of test</sup>  
 however the moisture content is documented but  
~~not~~ no method has been devised yet to determine  
 moisture content in situ

- 4d. Comments.

Reviewer Perhel/Mundell  
Date 2/23/84

5. What are the acceptance/rejection criteria for the test data?

all tests which were performed are included in data storage  
therocres which broken during shipping are not used  
written procedures include strict calibration checks and  
procedures for identifying and correcting errors

- 5a. Were these criteria established prior to test development?

Yes

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

in accordance with contractors procedures (data signed,  
reviewed and checked)

° Review Procedure

the contractors draft report is reviewed by SWEC  
the final report by ARA is reviewed and accepted by SWEC

° Corrective Action

written procedures for corrective actions

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

These laboratory tests provide detailed information on the properties of a small sample from a specific location. They do not provide ~~information for~~ design in situ properties directly.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Well completion reports are essential to evaluate & extrapolate the laboratory test data.

The well completion reports for each well are provided by SWEC to ONWI.

For this test the well completion report used is BMI/SRP - 5009

Permian Basin  
Palo Duro

1

Reviewer Pashel / Mundell  
Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Specific gravity & total porosity lab. test, G. F. Fienel #1,  
S-79, GFR 2635.3-2635.4, lower San Andres, unit #4  
dolomite limestone, date of test ... approx Nov. 83

- 1a. What is the overall objective of the test?

date traceable back to the REI  
data sheets  
add to the data base and correlation with geophysical  
logs

- 1b. What specific parameters are to be determined by the test?

Water Content, Specific gravity, effective and total porosity

- 1c. What criteria were used for test site (or sample) selection?

1. lithologic unit of interest specific to porosity  
2. samples reasonably homogeneous and representative of  
a larger interval

- 1d. How is the rock at the test site characterized?

core logs, core photographs, pre test petrographic description

- 1e. How many of these tests have been performed?

approximately 80

- 1f. How many tests are planned?

approx. 70

- 1g. Comments.

Testing done by Resource Engineering Inc. as subcontract  
to Stone & Webster Eng. Corp.

Core is obtained and logged by Stone & Webster E.C., sealed  
in plastic bags, shipped to TREG in Austin, samples  
are selected in Austin by SWEC and shipped to SWEC in Boston  
where test specimen are selected and shipped to REI



Reviewer Pashel / Mondell  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form

yes

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

Standard written procedure is based on COE, U.S. Army Rock Testing Handbook, RTH 107-80 and RTH 106-80 with some differences specified in writing.

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

Stone & Webster document: basis for contractors procedure which is reviewed, approved and controls the work

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

There have been revisions approved through the same process

- 2d. How are any deviations from the established procedures that occur during testing documented?

in nonconformance and disposition reports also detailed notes and comments follow the test

- 2e. Comments.

Non-standard technique using air psychrometer has recently been approved for future tests, based on comparisons of the two techniques on <sup>the</sup> same samples.

Reviewer Pestel / Mendell  
Date 8/13/84

3. What instrumentation is used for the test?

Basically a balance and a temperature controlled oven.  
The instrumentation is described in test procedure.

3a. How were the reliabilities\* of the instruments specified?

N/A

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

yes (NBS) Written calibration procedure approved by  
Stone & Webster in compliance with 10 CFR 50 Appendix B  
audited by Stone & Webster

3c. Are the calibrations traceable to national or industrial standards?

yes (NBS)

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer

Peshin / Mundell

Date

6/23/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

manual completion of data sheets including calculations

- 4a. How can the raw numerical data be retrieved?

data sheets in REF files  
Results in SWEC REPORTS.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

yes - tables clear and logical, calculation methods described

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

yes. the data are keyed to Geotechnical log by SWEC  
however the moisture content is documented at  
the time of test but no method has been devised  
yet to determine moisture content in situ

- 4d. Comments.

Reviewer Pashel/Hundell  
 Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

all tests which were performed are included in data storage  
 the cores which broke during shipping are not used  
 written procedures include strict calibration checks, identification and  
 correcting errors  
 the use or rejection of the data is left to the user, everything reported

- 5a. Were these criteria established prior to test development?

yes

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

in accordance with contractors procedures (data signed, reviewed and checked)

° Review Procedure

the contractors draft report is reviewed by SWEC  
 the final report by RFI is reviewed and accepted by SWEC

° Corrective Action

written procedures for corrective actions

The tests of effective and total porosity by RFI on 11 samples from drillhole G. FRIEMER #1 show a discrepancy in the magnitude of. The values of effective porosity are in 5 cases higher than the true porosities. The problem was thoroughly checked by SWEC and no laboratory test error found.

Reviewer Poshel / Mundell  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

These laboratory tests provide detailed information on the properties of a small sample from a specific location. They do not provide in situ properties directly.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

The well completion report for this well needs to be provided to complement the laboratory data.

Summary report on testing in each well is planned to be issued in FY 85.

Permian Basin  
Palo Duro

1

Reviewer

Date

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

1a. What is the overall objective of the test?

1b. What specific parameters are to be determined by the test?

1c. What criteria were used for test site (or sample) selection?

1d. How is the rock at the test site characterized?

1e. How many of these tests have been performed?

1f. How many tests are planned?

1g. Comments.

ReviewerDate

2. Is the procedure documented and complete, and is it in written form?

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

2d. How are any deviations from the established procedures that occur during testing documented?

2e. Comments.

ReviewerDate

3. What instrumentation is used for the test?

3a. How were the reliabilities\* of the instruments specified?

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

3c. Are the calibrations traceable to national or industrial standards?

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



ReviewerDate

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

- 4a. How can the raw numerical data be retrieved?

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

- 4d. Comments.

ReviewerDate

5. What are the acceptance/rejection criteria for the test data?

5a. Were these criteria established prior to test development?

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

- ° Data Handling

- ° Review Procedure

- ° Corrective Action

ReviewerDate

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Permian Basin  
Palo Duro

1

Reviewer

Date

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Slake Durability Index (S.D.I.)

- 1a. What is the overall objective of the test? Cored 4/18/84  
Core Run #711

- 1b. What specific parameters are to be determined by the test?

- 1c. What criteria were used for test site (or sample) selection?

- 1d. How is the rock at the test site characterized?

- 1e. How many of these tests have been performed?

- 1f. How many tests are planned?

- 1g. Comments.

ReviewerDate

2. Is the procedure documented and complete, and is it in written form?

2a. Is it a standard (ASTM) procedure? If yes, provide reference.

2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

2d. How are any deviations from the established procedures that occur during testing documented?

2e. Comments.

ReviewerDate

3. What instrumentation is used for the test?

3a. How were the reliabilities\* of the instruments specified?

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

3c. Are the calibrations traceable to national or industrial standards?

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

ReviewerDate

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

- 4a. How can the raw numerical data be retrieved?

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

- 4d. Comments.

Reviewer \_\_\_\_\_  
Date \_\_\_\_\_

5. What are the acceptance/rejection criteria for the test data?

5a. Were these criteria established prior to test development?

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

° Review Procedure

° Corrective Action



ReviewerDate

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Schmidt rebound hardness index, Dutton #1 well,  
YATES Formation 1272.3 (feet, depth), date of test 8/23/83

- 1a. What is the overall objective of the test?  
date of the core recovery is in Well completion report with ONW

add to the data base

- 1b. What specific parameters are to be determined by the test?

Schmidt rebound hardness index

- 1c. What criteria were used for test site (or sample) selection?

1. Lithologic unit of interest
2. Sample reasonably homogeneous

- 1d. How is the rock at the test site characterized?

core logs, core photographs, post test petrographic description

- 1e. How many of these tests have been performed?

approx. 100

- 1f. How many tests are planned?

5

- 1g. Comments.

Core is obtained and logged by SWEC, sealed in plastic bags, shipped to TBEG in Austin, samples are selected in Austin, and shipped to SWEC in Boston for testing. Summary report on testing in each well is planned to be issued in FY 85

Reviewer Mondell / Paschall  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form?

yes

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

yes - ISRM 1978, Part 3, "Suggested Method for Determination of the Schmidt Rebound Hardness"

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

Stone & Webster document: basis for contractors procedure  
what is reviewed, approved and controls the work

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

There have been revisions approved through the same process

- 2d. How are any deviations from the established procedures that occur during testing documented?

in nonconformance and disposition reports also  
detailed notes and comments follow the test

- 2e. Comments.

Reviewer Mantle/Richard  
Date 5/23/84

3. What instrumentation is used for the test?

listed in laboratory testing report supplied by RFI  
to SWEC

3a. How were the reliabilities\* of the instruments specified?

N/A

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

yes written calibration procedure approved by  
Stone & Webster in compliance with 10 CFR 50  
Appendix B, audited by Stone & Webster

3c. Are the calibrations traceable to national or industrial standards?

yes (NBS)

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer Mundell/Reid  
 Date 8/23/89

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

manual completion of data sheets including calculations

- 4a. How can the raw numerical data be retrieved?

data sheets in RFI files  
 Results in SWEC reports

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

yes - tables clear and logical,  
 calculation methods described

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

yes the data are keyed to geotechnical log by SWEC

However the moisture content is documented at the time of test but no method has been developed yet to determine moisture content in situ

- 4d. Comments.

Reviewer Mundell / Peshel  
 Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

all test which were performed are included in data storage  
 the cotes which broke during shipping are not used  
 written procedures include strict calibration checks and  
 procedures for identifying and correcting errors

5a. Were these criteria established prior to test development?

Yes

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

in accordance with contractors procedures  
 (data signed, reviewed, and checked)

° Review Procedure

the contractors altat report is reviewed by  
 SWEC, the final report by ARA is reviewed  
 and accepted by SWEC

° Corrective Action

written procedure for corrective actions

Reviewer Mundell/Psdel  
Date 8/25/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The laboratory tests provide detailed information on the properties of a small sample from a specific location. They do not provide in situ properties directly.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

The Well completion report for this well needs to be provided to complement the laboratory data.

Summary report on testing in each well is planned to be issued in FY 85.

Reviewer  
Date

S. Smykowsky / K. Waki  
8/23

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

GDI-14 GDI-39 June 1981  
GDI-15 GDI-40  
GDI-16 GDI-41 by WCC

- 1a. What is the overall objective of the test?

Triaxial Extension Unload Test.

To determine strength parameters + stress-strain relationship  
on salt cycle 6

depth  $\approx 3270'$  to  $\approx 3340'$

- 1b. What specific parameters are to be determined by the test?

radial + axial strain  
Elastic moduli

- 1c. What criteria were used for test site (or sample) selection?

Taken from salt cycle 6 in vicinity of repository horizon.

- 1d. How is the rock at the test site characterized?

salt with some samples having a small % anhydrite.

- 1e. How many of these tests have been performed?

9

- 1f. How many tests are planned?

none - testing completed

- 1g. Comments.

Reported Moduli values are reported for only 1 Tx extension  
unload test + 1 Tx Compression unloading test. It appears  
the moduli were never determined or reported for any of the other tests  
done.  
Poissons ratio, Bulk Moduli, Shear Moduli do not appear to be  
calculated.



Reviewer Smykowski/Wahi  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form?

*yes, in WCC files + in RPT's at ONWI on microfilm*

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

*no*

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

*Internal (WCC) development*

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

*N/A*

- 2d. How are any deviations from the established procedures that occur during testing documented?

*No apparent deviations were noted. Load values varied among tests.*

- 2e. Comments.

Reviewer Smykowski/Waki  
 Date 8/23/84

3. What instrumentation is used for the test?

*pressure cell, LVDT, circumferential strain gauge*

3a. How were the reliabilities\* of the instruments specified?

*not available*

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

*yes, dead wt. testers were used prior to each test after initial calibration.*

*The load cell was calibrated by an outside NBS approved lab*

3c. Are the calibrations traceable to national or industrial standards?

*yes*

3d. Comments.

*Apical and radial gauges gave erratic readings during test on sample GD1-16.*

*Quote from records on sample GD1-15: "Apical strain no good,"*

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

*Some Terminology on saw<sup>+ calculated</sup> data print out was unclear.*

*For example "total apical strain" and "apical strain"*

Reviewer Snukowski/Wahi  
Date 8/23/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

*Automated data acquisition system (HP-85 microcomputer)  
Printout of data tapes.*

- 4a. How can the raw numerical data be retrieved?

*WCC files + ONWI microfilm records*

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

*Yes, in ONWI-400 and on microfilm at ONWI, Columbia  
Relatively complete records*

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

*No. Conventional test loads were used.*

- 4d. Comments.

Reviewer Smeykowski/Wahle  
Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

*Supervisory personnel's judgement based upon visual inspection of stress-strain curves + numerical values of calculated data.*

- 5a. Were these criteria established prior to test development?

*Yes*

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

- Data Handling

*Judgement of supervisory personnel*

- Review Procedure

*In general, 2 people other than lab technician reviewed the data.*

- Corrective Action

*Depending on the anomaly, a test was either abandoned or started on a new sample. ~~Data~~*  
~~*for*~~

Reviewer Snykowski / Wahi  
Date \_\_\_\_\_

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

*None*

Reviewer K. Wali / S. Smykowski  
 Date 8/23

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

~~GD1~~ Triaxial compression loading/unloading / GD1-58, 59, ~~60~~, 61, 62, 63  
 64

- 1a. What is the overall objective of the test?

Determine elastic moduli and strength parameters  
 for ~~the~~ Salt cycle 6 samples from GD1 Borehole in  
~~from~~ Paradox Basin

- 1b. What specific parameters are to be determined by the test?

Young's Modulus, stress-rate curves, strength

- 1c. What criteria were used for test site (or sample) selection?

Salt from the vicinity of the expected repository  
 horizon.

- 1d. How is the rock at the test site characterized?

~~Salt with~~ Don't know

- 1e. How many of these tests have been performed?

~~Six~~ Six

- 1f. How many tests are planned?

None

- 1g. Comments.

Strength values not reported explicitly

ReviewerDate

2. Is the procedure documented and complete, and is it in written form?

Yes. Available in WCC Files, In RTPs at ONWI  
on microfilm

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

No

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

Internally developed Procedures

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

N/A

- 2d. How are any deviations from the established procedures that occur during testing documented?

~~with memoranda~~  
No apparent deviations were noted. Some alterations in the planned load values were made based on test results of ~~one~~ tests to date.

- 2e. Comments.

The procedures may be similar or the same as ASTM but are not identified as such.

Reviewer \_\_\_\_\_

Date \_\_\_\_\_

3. What instrumentation is used for the test?

Pressure cell, LVDT, strain gauges (~~trans~~ circumferential)

3a. How were the reliabilities\* of the instruments specified?

Don't know

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

yes. The load cell was calibrated by an outside approved lab. Dead-wt. testers were used prior to each test after initial calibration

3c. Are the calibrations traceable to national or industrial standards?

Most of the transducers are calibrated by lab. standards. The lab. standards are traceable to national standards.

3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



Reviewer \_\_\_\_\_

Date \_\_\_\_\_

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

Automated data acquisition system (HP-85)  
Printouts of data tapes available.

- 4a. How can the raw numerical data be retrieved?

WCC Files or ONWI microfilm records

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

Yes. Extensive records were kept on test data. WCC files as well as ONWI-400 report the data relatively completely.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

No. Conventional test loads were used.

- 4d. Comments.

Corrections related to strain data were made after an error was discovered in the program that calculates the strains. Terminology on raw ~~data~~ and calculated data printout unclear. For example, "modulus" is used as a heading without definition.

5. What are the acceptance/rejection criteria for the test data?

*Supervisory personnel's judgement based on visual inspection of stress-strain curves and numerical values of calculated data.*

- 5a. Were these criteria established prior to test development?

~~No~~ *Yes.*

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

*Not pure*

- Data Handling

*Judgement of supervisor*

- Review Procedure

*Two people (in addition to the technician) reviewed the data.*

- Corrective Action

*Certain data were ignored if instrument malfunction was suspected.*

ReviewerDate

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

Young's modulus reported was derived from only ~~two~~ <sup>one</sup> test out of ~~a dozen~~ six or so conducted

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

None

S.S.  $\dot{\epsilon} = A e^{-R\theta/\sigma} \sigma^n$

Transient  $\dot{\epsilon} = A e^{-R\theta/\sigma} t^a \sigma^{n'}$  1

Reviewer Wahi  
Date 9/22

Draft Rock Mechanics Data Review Checklist  
(Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

Creep Test GD 1-73 Start Date Sept. 11, 81  
(Triaxial) Laboratory

- 1a. What is the overall objective of the test?

Measure creep behavior of salt from Gibson Dome  
core (GD-1)

- 1b. What specific parameters are to be determined by the test?

Radial and axial strains as a fn. of time at  
different load increments

- 1c. What criteria were used for test site (or sample) selection?

Samples from expected repository horizon area  
in Salt Cycle 6 of the GD-1 hole.

- 1d. How is the rock at the test site characterized?

N/A (It is a lab test)

- 1e. How many of these tests have been performed?

Six

- 1f. How many tests are planned?

N/A

- 1g. Comments.

Refer to ONWI-400 for data on  
other tests.

Triaxial Extension Unload

ReviewerDate

2. Is the procedure documented and complete, and is it in written form?

Yes. A Woodward-Clyde Procedure is documented, complete and in written form. Available on microfilm File # 2931.2.3

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

No

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

Developed, reviewed and approved internally

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

No revisions. Specific work instructions were given by the geotechnical engineer.

- 2d. How are any deviations from the established procedures that occur during testing documented?

N/A

- 2e. Comments.

Reviewer \_\_\_\_\_

Date \_\_\_\_\_

3. What instrumentation is used for the test?

Four strain gages (two axial, two circumferential)  
 Electrical resistance (foil type) "Micro-Measurements, Inc."  
 Load Cell (axial), Pressure Transducer  
 Platen-to-Platen (LVDT) Displacement Transducer

- 3a. How were the reliabilities\* of the instruments specified?

Don't know

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

Yes. Dead wt. testers were used prior to each test after initial calibration.  
 The load cell was calibrated by an outside approved lab.

- 3c. Are the calibrations traceable to national or industrial standards?

Most transducers are calibrated by laboratory standards.  
 The lab. standards are traceable to national standards.

- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

Automated data acquisition system (HP-85 microcomputer)  
Printouts of data tapes. No backups.

~~Data~~ Creep data were fit to ~~the~~ an empirical creep law using non-linear least square fit.

- 4a. How can the raw numerical data be retrieved?

~~WCC~~ WCC Files or ONWI microfilm records.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

Yes. In particular, ONWI-400 reports the data very clearly.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

- to some extent. The temp of 50°C is only slightly higher (~15°C higher) than the ambient at repository depth. However, "extension unload" type of test was used that simulated stress conditions of an excavation better than a compression load triaxial

- 4d. Comments.

Certain tests used <sup>much</sup> higher than in-situ stress as the confining stress

Reviewer \_\_\_\_\_

Date \_\_\_\_\_

5. What are the acceptance/rejection criteria for the test data?

Instrument or equipment failure ~~are~~ are bases for rejecting data points. Anomalous ~~plot~~ points on a plot are symptomatic of instrument malfunction or equipment failure. No written guideline.

- 5a. Were these criteria established prior to test development?

Yes.

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

Judgement of supervisory personnel

° Review Procedure

In general, two people other than lab technician reviewed the data.

° Corrective Action

Depending on the anomaly, a test was either abandoned or started on a new sample. Data from erratic instruments was not utilized in the empirical fits.



ReviewerDate

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

Data interpretation and fitting appear to have questionable assumptions in that total strain value ~~is~~ <sup>(numerically)</sup> is reinitialized in determining steady state strain rates for different stages of loading in a given test.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

ONWI-400 & microfilm at ONWI

Reviewer WAH1  
 Date 8/23

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
 Elevated temperature extension unload tests on Salt Cycle 6.  
 GD1-36 (@ 50°C) ; GD1-37 (@ 100°C) ; GD1-38 (@ 150°C)  
 Aug. 21, 81-                      Aug. 24, 81
- 1a. What is the overall objective of the test?  
 Determine strength and elastic behavior as  
 a fn. of temperature.
- 1b. What specific parameters are to be determined by the test?  
 Stress-strain data at different temperatures.  
 Confined compressive strength
- 1c. What criteria were used for test site (or sample) selection?  
 Salt cycle 6 ~~consider~~ at a depth of ~3300 ft  
 considered representative of expected repository  
 horizon salt.
- 1d. How is the rock at the test site characterized?  
 Physical appearance?
- 1e. How many of these tests have been performed?  
 Three
- 1f. How many tests are planned?  
 None
- 1g. Comments.  
 Strain gauges did not function properly  
 for the most part. Erratic axial and radial  
 strains were experienced frequently.  
 Two sets of data are reported for  
 Specimen GD1-37 (File 37 and File 37A)

Reviewer K. WAHI  
Date 8/23

2. Is the procedure documented and complete, and is it in written form?

Yes. On WCC files and RTP (on microfilm)  
at ONWI.

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

No. Internal WCC procedures were written.

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

Developed, reviewed, and approved internally.

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

No revision to the procedure. Certain confining stress levels had to be lowered due to sealing problems.

- 2d. How are any deviations from the established procedures that occur during testing documented?

N/A

- 2e. Comments.

3. What instrumentation is used for the test?

LVD T, pressure cell, circumferential strain gauge  
(Disp. Transducers)

- 3a. How were the reliabilities\* of the instruments specified?

Unknown

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

Yes. Dead-wt. Testers were used prior to each test after initial calibration.

The load cell was calibrated by an outside, approved lab.

- 3c. Are the calibrations traceable to national or industrial standards?

Most transducers are calibrated by laboratory standards. The lab. standards are traceable ~~by~~ to national standards.

- 3d. Comments.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

Automated data acquisition system (HP-85)

Printouts of data tapes and hand written notes. Simple formulae for converting displacements and loads to strains and stresses were programmed into the microcomputer.

- 4a. How can the raw numerical data be retrieved?

WCC Files and ONWI microfilm (RTPs)

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

Yes. Extensive notes, documentation, and plots are included in the WCC files to trace the tests completely.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

Yes. Near-field temperatures will most likely range between  $100^{\circ}\text{C}$  and  $150^{\circ}\text{C}$ . Tests were performed at  $50^{\circ}\text{C}$ ,  $100^{\circ}\text{C}$ , and  $150^{\circ}\text{C}$  at sufficiently large confining stresses.

- 4d. Comments.

ReviewerDate

5. What are the acceptance/rejection criteria for the test data?

Supervisory personnel's judgement based on  
visual inspection of stress-strain data  
Tests were to be stopped at failure or 20% strain.  
(total)

- 5a. Were these criteria established prior to test development?

Yes

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

Unsure.

- Data Handling

Judgement of supervisor

- Review Procedure

In General, Two people reviewed the data

- Corrective Action

or hardware problem

If instrument malfunction was  
suspected, the data were ignored  
or test stopped

Reviewer  
Date

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

No moduli ~~for~~ calculated at elevated temperatures. One test (GD1-38) did not appear to have the correction applied to all other tests; namely the error in the strain calculation algorithm that was identified. See Fig. B-15, p. 149, ONWI-400.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

Reviewer Abelow  
 Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

YOUNG'S MODULUS OF SALT SAMPLES FROM  
 DRILL LOGS.

- 1a. What is the overall objective of the test?

MEASUREMENT OF DEFORMATION  
 CHARACTERISTIC.

- 1b. What specific parameters are to be determined by the test?

E

- 1c. What criteria were used for test site (or sample) selection?

ENTIRE MINE

- 1d. How is the rock at the test site characterized?

SALT, ANHYDRATE, ETC

- 1e. How many of these tests have been performed?

CONTINUOUS (~ 6000)

- 1f. How many tests are planned?

NO MORE

- 1g. Comments.

INTERPRETED FROM SOME DATA



Reviewer Abdoun  
Date 8/23/21

2. Is the procedure documented and complete, and is it in written form?

NO; ~~SE~~

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

YES - REFERENCE NOT GIVEN (OUR OWN)

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

NO REVIEW

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

N/A

- 2d. How are any deviations from the established procedures that occur during testing documented?

NOT APPARENT

- 2e. Comments.

Reviewer ABrown  
 Date 8/27/84

3. What instrumentation is used for the test?

DOWNHOLE SONIC LOGGING TOOL

3a. How were the reliabilities\* of the instruments specified?

NOT SPECIFIED

3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

YES, BUT NO RECORD

3c. Are the calibrations traceable to national or industrial standards?

PRESUMABLY, BUT NO RECORD

3d. Comments.

3-D LOGS (3 OF THEM) -  
 500-2710 (WELUX)  
 2490-5525 (BROWN)  
 5525-6380 ( ✓ )

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer ABrown  
Date 5/23/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

ANALYTICAL ANALYSIS OF SOME LOG DATA

- 4a. How can the raw numerical data be retrieved?

FROM TAPES OR HAND COPY OR USBs

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

YES

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

NOT IN CURRENT FORM

- 4d. Comments.

LOOSE LOGS.

Reviewer Abou  
Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

All Accepted

5a. Were these criteria established prior to test development?

N/A

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

N/A

- Data Handling

N/A

- Review Procedure

N/A

- Corrective Action

N/A

Reviewer Abrom  
 Date 3/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

TWO CHECKS:		YOUNG'S MODULUS (PSI x 10 <sup>6</sup> )	
DEPTH	ONW 400 REF	WWC	LOG
3294	P 160	4.1	5.5
3277	P 153	4.3	5.4

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

NONE

NOTE: YOUNG'S MODULUS DOES NOT APPEAR TO BE STRESS OR TEMPERATURE DEPENDENT (UNLESS THEY CAN BEY BASED ON CONSTANT VALUES IN LOGS.

Reviewer Abrown  
 Date 8/22/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

HOLTZCLAW #1, HYDRAULIC TESTS

- 1a. What is the overall objective of the test?

INSITU STRESS DETERMINATION

- 1b. What specific parameters are to be determined by the test?

HORIZONTAL STRESS (TOTAL)

- 1c. What criteria were used for test site (or sample) selection?

GEOLOGY, GEOPHYSICS

- 1d. How is the rock at the test site characterized?

VISUAL, ETC

- 1e. How many of these tests have been performed?

5 IN THIS HOLE

- 1f. How many tests are planned?

NO MORE AT PRESENT.

- 1g. Comments.

TERRA TEK FOR SWEC. REFERENCE.

IN-SITU STRESS DETERMINATION BY HYDRAULIC  
FRACTURING, HOLTZCLAW #1 WELL, BY D.D. BISH

AND N. BARTON, TERRA TEK, SALT LAKE CITY,  
 REPORT TRG 84-04, JUNE, 1984.

Reviewer A Brown  
Date \_\_\_\_\_

2. Is the procedure documented and complete, and is it in written form?

NOT AS FAR AS CAN BE ASCERTAINED

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

NO

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

FROM LITERATURE (BROEDHOFF ET AL, 1976) AND  
ONW CONTRACTOR EXPERIENCE (NELSON ET AL,  
1982 - ONW 400)

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

SOME MODIFICATIONS AS THEY WENT ALONG

- 2d. How are any deviations from the established procedures that occur during testing documented?

IN REPORT

- 2e. Comments.

PROCEDURE HAS BECOME RELATIVELY STANDARD  
OVER LAST DECADES.

Reviewer

Date

3. What instrumentation is used for the test?

UPHOLD PRIMARY TEST EQUIPMENT (HIP, TERRAQUANTZ)  
DOWNHOLD SECONDARY CHECK EQUIPMENT (LYNES)  
LYNES DOWNHOLD RECUSER ASSEMBLY

- 3a. How were the reliabilities\* of the instruments specified?

THEY WEREN'T

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

YES (DATA PROVIDED IN REPORT)

- 3c. Are the calibrations traceable to national or industrial standards?

YES

- 3d. Comments.

REUNDANT SYSTEMS THROUGHOUT.  
LITTLE EVIDENCE IN REPORT THAT THIS REDUNDANCY  
WAS CONSISTENTLY USED IN EVALUATION

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



Reviewer \_\_\_\_\_

Date \_\_\_\_\_

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

EMPIRICAL DATA ANALYSIS BASED ON DEBATABLE  
THEORETICAL BASIS, ESPECIALLY IN SALT  
ANALYTICAL ANALYSIS

- 4a. How can the raw numerical data be retrieved?

FROM REPORT, OR DATA TAPES AT TERRA TEK

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

YES

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

YES

- 4d. Comments.

THORNTON, IF SOMEWHAT ACADEMIC, EVALUATION.  
INTERPRETATION OF TESTS APPEARS MORE  
TECHNICAL THAN ~~THE~~ NRC REQUIREMENTS

Reviewer \_\_\_\_\_  
Date \_\_\_\_\_

5. What are the acceptance/rejection criteria for the test data?

<sup>BUT ONE</sup>  
ALL WERE ACCEPTED, DESPITE APPARENT  
FRACTURE PROPAGATION BELOW LOWER PEEKER  
IN SUBSTONE & ANHYDRITE TESTS; FAILED TEST WAS  
ANALYSED FOR ALL AVAILABLE DATA

5a. Were these criteria established prior to test development?

APPARENTLY NOT.

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

ACCEPTED

° Review Procedure

EVALUATED

° Corrective Action

REPORTED

ReviewerDate

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

DATA IN GENERAL APPEAR OF APPROPRIATE  
ACCURACY FOR HLW PROGRAM. DETAILED <sup>UNNECESSARY</sup>  
EVALUATION APPEARS SOMEWHAT ~~SPORADIC~~,  
IN OPINION OF REVIEWER THE FINDINGS AVOID  
MUCH OF THE DATA NEEDED ON STRESS  
IN THIS AREA FOR THE HLW PROGRAM

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

NONE.

Reviewer A Brown  
 Date 8/22/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.

GDST's - GEOTECHNICAL DATA TESTS  
 GIBSON DOME HOME GD-1,

- 1a. What is the overall objective of the test?

CREEP TESTS  
 HYDROFLACING TESTS

- 1b. What specific parameters are to be determined by the test?

VOLUMETRIC CREEP RATE  
 IN STN STRESS

- 1c. What criteria were used for test site (or sample) selection?

IN PROPOSED REPOSITORY LOCATION AND  
 ASSOCIATED STRATA

- 1d. How is the rock at the test site characterized?

BY CORE INSPECTION & GEOPHYSICAL LOGS

- 1e. How many of these tests have been performed?

5 CREEP (2 FAILED)  
 6 HYDROFLACING (1 FAILED)

- 1f. How many tests are planned?

NO MORE

- 1g. Comments.

TESTS CONDUCTED AFTER DRILLING & REAMING  
 DESCRIPTION IN FIELD NOTES (ONLY LOG 2922.1,  
 READ) ~~DO~~ APPEAR TO ACCORD WITH SNW-400  
 DESCRIPTION (ALTHOUGH DETAILS OF CONTINUAL  
 PROBLEMS WITH LINES EQUIPMENT WERE OMITTED)

Reviewer Abrown  
 Date 8/22/84

2. Is the procedure documented and complete, and is it in written form?

NOT IN FILES - EACH TEST <sup>PLAN</sup> DOCUMENTED IN  
 FIELD NOTES. PLAN IS IN FILES - REF 160, PLANS 135-6

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference. PBP PROCEDURE

NO

+ 28

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

BY TRAIL & ERROR (EXCLUSIVELY DOCUMENTED  
 IN FIELD LOG)

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

YES - IN FIELD

- 2d. How are any deviations from the established procedures that occur during testing documented?

IN FIELD NOTES & ON W. 400

- 2e. Comments.

TO SOME EXTENT A PIONEERING TEST  
 APPROACH, APPLICABLE ONLY TO AN ~~AND~~  
 ESSENTIALLY IMPERMEABLE, CREEP PRONE  
 MATERIAL

Reviewer ABrown  
Date 8/22/84

3. What instrumentation is used for the test?

LYNES PACKER SYSTEM, DOWNHOLE PRESSURE TRANSDUCERS, UPHOLE DATA RECORDING

- 3a. How were the reliabilities\* of the instruments specified?

NOT SPECIFIED. A HIGH LEVEL OF REDUNDANCY WAS BUILT INTO INSTRUMENTATION

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

YES

- 3c. Are the calibrations traceable to national or industrial standards?

YES

- 3d. Comments.

SYSTEM CALIBRATED IN CASED SECTION  
PRESSURE GAGES CALIBRATED BY NORTHWEST  
REGIONAL CALIBRATION CENTER, BELLEVUE, WA.  
NO RECORD OF POST-TEST CALIBRATION.  
RELATIVE CHECKS BETWEEN TRANSDUCERS AND

- \* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

OF INCREMENTAL ACCURACY ARE EXCELLENT.

Reviewer ABLOW  
 Date 8/22/32

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (empirical, analytical, numerical)

COLLECTION - AS PER ONW 400

ANALYZING - ANALYTICAL

INTERPRETING - ANALYTICAL

PRESENTATION - COMPUTER TAPE, PLOTS, ONW 400

- 4a. How can the raw numerical data be retrieved?

FROM COMPUTER TAPES (TAKEN ON HP 9825,  
 TRANSLATED TO HP 85) OR FROM MICROFILM  
 HARD COPY

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

YES, IN GENERAL

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

YES

- 4d. Comments.

EXCELLENT DATA & FINE CLARITY

Reviewer ABrown  
 Date 8/22/84

5. What are the acceptance/rejection criteria for the test data?

BASICALLY FAILED PACKERS, <sup>AND TRANSVERSALS</sup> WERE THE  
 CAUSE OF "FAILED" TESTS

5a. Were these criteria established prior to test development?

yes

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

FIELD SUPERVISOR EVALUATES REJECTION/  
 ACCEPTANCES BASED ON REAL-TIME  
 EVALUATION

° Review Procedure

REVIEW IS PERFORMED BY FIELD  
 PROJECT MANAGER (GEOTECH) - IN THIS  
 CASE R.A. NELSON OF WCC.

° Corrective Action

RETEST.



Reviewer Abrown  
 Date 3/22/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

CAREFULLY PERFORMED, WELL DOCUMENTED  
 TESTS. ANALYSIS

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

NONE - DATA PRESENTATION IS EXCELLENT (GRAPHICAL)  
 IN ONMI 400. THE ONLY TESTS NOT  
 REPORTED ARE "FAILED TESTS", WHICH  
 WE LOOKED AT IN MICROFILME.

Reviewer M. DeMarco  
 Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
 Uniaxial compression tests, GD-1-2, 3, 4, 5, 7, began 4/28, thru 6/12/82, from cycle 6 Gibson Dome Horizon.
- 1a. What is the overall objective of the test?  
 Determine unconfined strength of sample.
- 1b. What specific parameters are to be determined by the test?  
 unconfined compressive strength (no modulus)
- 1c. What criteria were used for test site (or sample) selection?  
 samples had to come from cycle 6, but were not grouped together. They are reported in ONWI 400 as low anhydrite samples but samples 2, 3, & 4 are listed in WCC data files as high 90 anhydrite (which is shown in the porosity data for the same samples)
- 1d. How is the rock at the test site characterized?  
 Nearly pure halite with minor amounts of anhydrite, potassium and high solubility salts.
- 1e. How many of these tests have been performed?  
 5
- 1f. How many tests are planned?  
 N/A
- 1g. Comments.  
 Again, cone handling and storage is questionable. Two samples were destroyed at the lab due to anomalies in the cone, which should have been reported. Moisture contents should have been recorded (especially since permeability tests were run on these samples also).

Reviewer M. DeMarco  
 Date 8/23/84

2. Is the procedure documented and complete, and is it in written form?  
 WCC uses ASTM documentation as their written procedure with one minor modification - the loading rate is such that failure occurs beyond 15 minutes.

2a. Is it a standard (ASTM) procedure? If yes, provide reference.  
 Yes - D2938-79 ASTM (with the above modification)

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

N/A

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

In addition to the failure time modification above, "failure" is described as occurring when a) the sample breaks, b) strain reaches 20%, or c) stress difference exceeds 10,000 psi.

- 2d. How are any deviations from the established procedures that occur during testing documented?

By simple memo from tester to WCC supervisory personnel. This system is found on microfilm of WCC data files. The microfilm is now in NRC possession.

- 2e. Comments.

The sample depth locations reported in WCC files do not agree with those reported in ONWI 400.

Reviewer M. DeMarco  
 Date 8/23/84

3. What instrumentation is used for the test?  
 Two circumferential strain gages and 3 pairs of axial strain gages attached to the specimen at the quarter points, load cell (axial), and platen-to-platen LVDT's.
- 3a. How were the reliabilities\* of the instruments specified?  
 Load cells and strain gages are used and relied upon according to manufacturer specifications.
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?  
 Load frame calibration is periodic and conducted by outside firms. The strain gages are not checked out, but used in accordance to specs. Calibration data is not presented in the files of WCC in the section concerning the uniaxial tests.
- 3c. Are the calibrations traceable to national or industrial standards?  
 Where applicable.
- 3d. Comments.  
 Only 2 strain gages are used to measure any one axial strain data point. Common lab practice requires 3 at 120° separations. Also, WCC data files mention the possible inadequacy of the chosen gages, but no further mention was made of it.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

Reviewer M. Dellarco  
 Date 8/23/84

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

HP-85 data acquisition with plotter is used to collect, format, and analyze all data. In-house programs are used and debugging of these programs has also been an in-house responsibility.

- 4a. How can the raw numerical data be retrieved?

WCC data file or ONWI/NRC microfilm

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

Data file information is complicated and not prioritized, however results are presented well in ONWI 400.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

The tests were run at 22°C and none were considered for elevated temperatures. Water contents were surely dissimilar to site conditions due<sup>to</sup> the handling and storage method.

- 4d. Comments.

Reviewer M. DeMarco  
Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

Apparently ~~none~~ <sup>were reported</sup> for this test. During the tests 3 of 5 samples had strain gage malfunctions and had to be restarted. One of the three had to be started three times. These do not conform to standard lab practice, but due to cone shortages the data was preserved and reported. Ideally, many more tests would be run with these tests discarded.

- 5a. Were these criteria established prior to test development?

N/A

- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

° Data Handling

Acceptance / rejection is apparently operator controlled.

° Review Procedure

Same

° Corrective Action

Supervisory personnel reviewed the findings concurrently with testing and provided any corrective measures needed. The largest error in Q/A was not testing the procedure prior to salt cone testing. For example, the strain gage problem would have been solved prior to testing.

Reviewer M. DeMarco  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The objective of this test was not thoroughly realized. Only five tests were completed, three of which are questionable due to strange loading conditions. Of the five samples two were characterized as containing high % anhydrite (as discussed briefly in WCC notes, not in ONWI 400). The limited number and characteristics of the tests do not allow for cycle to characterization. Higher loading rate data would have been desirable.

Q/A is also somewhat unclear. WCC data files have memos referring to the difficulty of acquiring and building equipment to meet contract deadlines. In fact, it was internally suggested that outside firms be solicited

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

NONE

to do the work to insure the quality of the results. This was not done and perhaps should have been. The bugs were not worked out of the test procedure prior to salt testing and it is suspected that this was due to their quote "tight schedule".

The lack of samples to test is not a reflection of WCC commitment. Samples were needed for many tests and only one hole's worth is available.

Reviewer M. DeMarco  
 Date 8/23/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
 Ultrasonic Pulse Velocity, GDI-4, 5, 7, 14, 15, 16, 32, 3, 2  
 tests were conducted on or about 6/1/81
- 1a. What is the overall objective of the test?  
 Provide elastic modulus data on GDI cycle 6 salt.
- 1b. What specific parameters are to be determined by the test?  
 P and S wave velocities.
- 1c. What criteria were used for test site (or sample) selection?  
 No apparent criteria was used other than the salt was  
 from cycle 6.
- 1d. How is the rock at the test site characterized?  
 Mostly halite with small amounts of anhydrite, potassium, and  
 soluble salts.
- 1e. How many of these tests have been performed?  
 9, however several of the tests were performed in a  
 variety of directions.
- 1f. How many tests are planned?  
 None
- 1g. Comments.  
 These tests can be believed for the velocities due to  
 similarity with other salt and soft rock data. Also,  
 badly fractured samples were run first to see if  
 velocities could be obtained at all, and the data came  
 out quite well.



Reviewer M. DeMarco  
Date 8/23/84

2. Is the procedure documented and complete, and is it in written form?  
Portions of the procedure and theory are documented with hand written comments (that are difficult to read) that do not appear to be complete.
- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.  
The test procedure used by the subcontractor, Testing Engineer Inc., is not provided.
- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.  
N/A
- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?  
N/A
- 2d. How are any deviations from the established procedures that occur during testing documented?  
N/A
- 2e. Comments.  
The specifics of the test are not clear.

Reviewer M. DeMarco  
Date 8/23/84

3. What instrumentation is used for the test?

James V-scope with 54 kHz transducers

- 3a. How were the reliabilities\* of the instruments specified?

They were not specified. It is likely that WCC assumed TEI's methods to be technically sound.

- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?

On one nearly blank data book cover sheet it is noted that a calibration was done. No description of the calibration procedure or occurrence is given.

- 3c. Are the calibrations traceable to national or industrial standards?

N/A

- 3d. Comments.

WCC did not document QA concerns regarding TEI's work.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.

4. What are the data collection, reduction, and presentation techniques involved in collecting analyzing and interpreting the data? (emperical, analytical, numerical)

Not discussed in wcc data files.

- 4a. How can the raw numerical data be retrieved?

It may be possible to get it from TEI files.

- 4b. Are the data presented in a complete and clear format?  
(Comment also on the utility of the presentation.)

No data, other than a memo from TEI to wcc with the test results included, exists.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

The wave velocities are probably influenced to some degree by the physical integrity of the core, which is suspect due to poor handling and storage.

- 4d. Comments.

Reviewer M. DeMarco  
Date 8/23/84

5. What are the acceptance/rejection criteria for the test data?

No way of knowing.

5a. Were these criteria established prior to test development?

N/A

5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)

N/A

- ° Data Handling

- ° Review Procedure

- ° Corrective Action

Reviewer M. DeMarco  
Date 8/23/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The velocity data results were made available to WCC, however, they were not converted into engineering parameters (modulus) and have not been published anywhere. The intentions of these tests is unclear. Future review into the adequacy of these tests is necessary if this data is to be used.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

None - unless the modulus is going to be calculated and presented at a later date.

Reviewer M. DeMarco  
 Date 8/22/84

Draft Rock Mechanics Data Review Checklist  
 (Revision, August 6, 1984)

1. Name/type, identification number, and date of test.  
 Extension unloading creep test, GD-1-73, began 9/11/81, sample came from 3309.8 - 3310.5 horizon.
- 1a. What is the overall objective of the test?  
 To determine strain dependency on stress path, specifically, but to also characterize unloading creep characteristics of in situ salt structures.
- 1b. What specific parameters are to be determined by the test?  
 Axial stress, axial strain, radial strain, temperature, and time are being monitored to determine relationships between stress difference and strain rate at various temperatures and confining pressures.
- 1c. What criteria were used for test site (or sample) selection?  
 Test set samples (generally in groups of 3) were selected from immediately adjacent core. All samples tested came from cycle 6, Paradox Basin. All samples were selected to be void of major anomalous inclusions.
- 1d. How is the rock at the test site characterized?  
 Nearly pure halite with minor amounts of anhydrite, potassium, and high solubility salts.
- 1e. How many of these tests have been performed?  
 6 (but several are multi-staged tests)
- 1f. How many tests are planned?  
 N/A
- 1g. Comments.  
 Core handling and storage is questionable. No attempt was made to maintain moisture contents.

Reviewer M. DeMarco  
Date 8/22/84

2. Is the procedure documented and complete, and is it in written form?

Yes, contained in WCC file documentation (2931.2.3)  
and is on microfilm.

- 2a. Is it a standard (ASTM) procedure? If yes, provide reference.

No

- 2b. If non-"standard", how was the procedure developed, reviewed, documented, and approved? For example, COE, USBM, USBR, USGS, NBS, or other (internal) processes.

WCC developed in-house. QA conducted in-house.

- 2c. Have there been revisions and how and when were the revisions reviewed, documented, approved, and implemented?

No revisions made to method during or prior to testing.

- 2d. How are any deviations from the established procedures that occur during testing documented?

No desired deviations from the established procedure were included during testing.

- 2e. Comments.

Deviations in the data, especially concerning load increments, isolated load changes, and final loads achieved are not due to procedural changes, but physical variables influencing the test.

Reviewer M. Delmarco  
Date 8/22/84

- \* 3. What instrumentation is used for the test?  
 Two axial strain gages and two circumferential strain gages attached to specimen, axial load cell, confining pressure electrical pressure transducer, platen-to-platen LVDT, standard triaxial cell.
- 3a. How were the reliabilities\* of the instruments specified?  
 Strain gages were checked according to manufacturer specs and used in accordance to these same specs. The strain gages may not have functioned according to specs over long periods of time.
- 3b. Is there a calibration system and were calibrations systematically carried out according to approved procedure?  
 Yes, thermal tests did not practice strain gage calibration, but the manufacturer provided information shows changes ~~are~~ due to  $\Delta T$  maximizing at 0.5% of full readout, which is miniscule.
- 3c. Are the calibrations traceable to national or industrial standards?  
 Yes, aluminum calibration compared to "Structural Engineers Handbook". All calibrations traceable to lab standards, which in turn are traceable to outside firms calibrating the equipment to accepted standards.
- 3d. Comments.  
 All calibration data is documented.

\* Reliability is defined as the probability of an instrument to perform a stated function under a stated environment for a stated time.



Reviewer M. DeMarco  
 Date 8/22/84

4. What are the data collection, reduction, and presentation techniques involved in collecting, analyzing and interpreting the data? (empirical, analytical, numerical)

Computer techniques are used to acquire, reduce, and present data (HP-85). Programs were all prepared in-house.

- 4a. How can the raw numerical data be retrieved?

WCC data file or ONWI microfilm.

- 4b. Are the data presented in a complete and clear format?  
 (Comment also on the utility of the presentation.)

Data is complete, but documentation with the data is minimal thereby limiting the utility of the data by outside reviewers. Refined data is presented clearly in ONWI 400.

- 4c. Are the data keyed to geological, environmental, and other experimental conditions?

50°C over ambient was deemed appropriate for most structure designs. Mechanical failures of seals at temperatures > 50°C precluded testing at anticipated site temperatures. Also, the cores are subject to dissimilar water contents due to handling and storage. Pressures for confining pressures were approximately depicting worst case stress concentrations around openings. Whether or not this is accurate depends on the environment of the opening, (especially around the canisters).

- 4d. Comments.

Reviewer M. DeMarco  
Date 8/22/84

5. What are the acceptance/rejection criteria for the test data?  
Primarily based on equipment failure and anomalous calibrations in mid-suite testing.
- 5a. Were these criteria established prior to test development?  
N/A
- 5b. How are the criteria implemented? (Data handling, review procedure, corrective action.)
- Data Handling  
Acceptance/rejection is operator controlled, as well as by engineering staff review (QA driven reviews)
  - Review Procedure  
same as above
  - Corrective Action  
Supervisory review, comment, documentation results in corrected methods in the lab, and justified data.  
Example, maintaining stress deviations was difficult and noticeable in early tests. Corrective measures were taken immediately. A debugging program for the creep test operation system should have been implemented.

Reviewer M. Delmarco  
 Date 9/22/84

6. General comments (such as, relationship among different tests, impacts on interpretation, instrument redundancy, factors resulting in test closure, accuracy of measurements, limitations, additional uses of data, computer programs, and other miscellaneous comments).

The method used to derive the creep law parameters is unclear and may be in error. The unloading extension creep tests were actually multi-staged at various deviated stress levels approximately on week long duration steps. However, the steady state strain rate parameters were determined by curve fitting which included the transient terms as well. Two controlled variables come into play with how the data comes out: time of test duration and magnitude of stress difference. No standardized duration is used in the calculations to normalize the derived data. The calculated steady-state strain rates, determined in conjunction with the transient steady-state strain rate, do not involve the entire strain history of the sample. Instead, each stage of testing represents a zeroed duration, regardless of the acquired strain.

7. Requested Test Data - (Identify all data and documentation that is needed for further review).

None

→ **crit:** It was also brought out during discussions with WCC that although some data points are in question and are in turn well documented, they are improperly included in the analysis and interpretation of the data. Such points should have been documented and discarded, and not incorporated in the data evaluation.

**General:** The contractor was not aware of the degree of review that would be conducted or the data would have been presented much more cleanly and concisely.