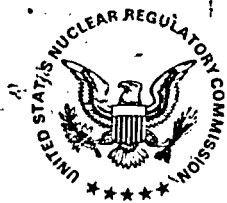


UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555



WM DOCKET CONTROL  
CENTER

JUN 08 1984

'84 JUN 11 A11:40

Memorandum For: Robert E. Browning, Director  
Division of Waste Management

From: Tilak R. Verma, Senior On-Site  
Licensing Representative  
Salt Repository Project (SRP)

SUBJECT: SRP SITE REPORT FOR THE WEEK OF JUNE 4, 1984

1. I received and reviewed the QA audit reports prepared by ONWI for the SRPO QA audits of the Texas Bureau of Economic Geology (TBEG) and the United States Geological Survey (U.S.G.S). These reports are quite brief; however, they do point out the areas where improvements have been made and the areas where deficiencies still exist. Copies of these two reports are attached.
2. On June 5, 1984, I attended a presentation given by Fluor Engineers, Inc. Conceptual Design Logic for the Salt Repository was presented. Subcontractors assisting the Fluor Engineers, Inc. are Morrison-Knudsen, SAI, Woodward-Clyde and Engineered System.
3. On June 5, 1984, I attended (as an observer) a Discussion Meeting on Results of Hydrochemical and Isotopic Hydrology Characterization of Palo Duro Deep Basin Brines, Texas Panhandle. A copy of the agenda for the meeting is attached. Discussions focused on the quality and quantity of the hydrochemical and isotopic data and their interpretation.
4. On June 8, 1984, I met with Neff and discussed with him some of my observations from the QA audits I attended as an observer.

*Tilak R. Verma*

Tilak R. Verma  
Senior On-Site  
Licensing Representative

TRV:2780B

cc: M. Bell  
J. Bunting  
H. Miller  
M. Knapp  
J. Greeves  
F. Cook  
P. Prestholt  
J. Linehan  
R. Johnson  
N. Numark

WM Record File  
*106*

WM Project 16  
Docket No. \_\_\_\_\_  
PDR ☒  
LPDR ☒

Distribution: REP	NN	BCook
MJB HK JLinehan	LH	PPrestholt
JOB JE RJohnson	HM	
(Return to WM, 623-SS)		C2

8407170080 840608  
PDR WASTE  
WM-16

PDR

06583



Department of Energy  
Chicago Operations Office  
Salt Repository Project Office  
505 King Avenue  
Columbus, Ohio 43201-2693

April 25, 1984

Mr. W.L. Fisher, Director  
The University of Texas at Austin  
Bureau of Economic Geology  
University Station, Box X  
Austin, Texas 78712

Dear Mr. Fisher:

SUBJECT: SRPO QA AUDIT OF TBEG'S WEST TEXAS PALO DURO BASIN PROJECT  
CONTRACT DE-AC97-83WM-46651

Attached is the audit report for the Quality Assurance (QA) audit conducted by the Salt Repository Project Office (SRPO), on March 29-30, 1984, on the West Texas Palo Duro Basin Project.

As stated in the audit report, the main purpose of this audit was to verify the corrective actions taken by TBEG on last year's DOE audit conducted in March 1983.

The results of the audit indicated that TBEG's QA program has improved considerably since the last SRPO QA audit conducted in March 1983. Several positive activities were noted and are mentioned in the audit report. However, continued effort is needed to bring the QA program up to an effective level of operation.

This audit report contains four observations in the areas of test control, training and planning, and incident reporting.


Project personnel should review and evaluate the status of all observations and provide SRPO with an assessment and a schedule for implementation of corrective action within 30 days of receipt of this letter.

The report also contains several comments for further improvement in the program. The comments do not require any written response, however, they should be reviewed and evaluated by your project personnel for future implementation.

Mr. W.L. Fisher, Director  
Page 2

The cooperation and responsiveness of your personnel during the conduct of the audit are appreciated. If you have any questions concerning the QA audit, please contact me at (614) 424-5916, ext. 14.

Sincerely,



Ram B. Lahoti  
Manager  
Quality Assurance

SRPO:KBL:kgh

Enclosure:  
As Stated

cc: C. Williams, Jr., BPMD  
R. Murthy, BPMD  
D. Ratcliff, TBEG  
J. Jones, SRPO  
R. Wunderlich, SRPO  
J. Sherwin, SRPO  
T. Taylor, SRPO  
L. Parys, SRPO  
J. Neff, SRPO

ST# 481-84

QUALITY ASSURANCE AUDIT  
of  
WEST TEXAS PALO DURO BASIN PROJECT  
(DOE ID DE-AC97-83WH46651)  
(ONWI ID E530-05100)

at  
UNIVERSITY OF TEXAS AT AUSTIN  
BUREAU OF ECONOMIC GEOLOGY  
Austin, Texas

AUDIT PURPOSE AND SCOPE

This report contains the results of the quality assurance audit of the subject project conducted on March 29-30, 1984. The purpose of the audit was to review the Texas Bureau of Economic Geology's (TBEG's) quality assurance program for compliance with DOE QA requirements established for this project and to verify the implementation of the corrective action to Audit Report No. 83-E-06.

The scope of the audit included review of operations, equipment, and activities which are located in Austin at the University of Texas, Geology Building, TBEG South Building, Well Sample and Core Storage Facility (WSL) at Balcones Research Center, the TBEG Mineral Studies Laboratory (MSL), and TBEG's Records Center.

### AUDIT PARTICIPANTS

#### Audit Team Members

Ram Lahoti	- SRPO QA Manager (Lead Auditor)
Ram Murthy	- ONWI Lead QA Specialist (Auditor)
Jay Jones	- SRPO Project Manager (Observer)
Tilak (Teek) Verma	- NRC Representative (Observer)

#### Principal Contractor Personnel Contacted

Tom Gustavson	- Principal Investigator
Charles Kreidler	- Principal Investigator
Andy Smith	- Research Associate
Doug Ratcliff	- QA Officer
Dow Davidson	- QA Specialist
Jerry Wermund	- Associate Director
Carolyn Condon	- QA Specialist

### SUMMARY

TBEG's QA program has improved significantly since the last DOE audit conducted March 1983. Several positive activities as well as deficiencies in the areas requiring attention are discussed in this report.

The implementation of corrective action on all the observations except for Observation No. 1 of the previous Audit Report No. 83-E-06 has been considered satisfactory and therefore does not need any further followup. However, Observation No. 1 has been reissued in this report for future verification.

It should be recognized that deficiencies may exist other than those cited in the report, particularly in areas not examined by the audit team. Therefore, your organization should continue to review and audit all aspects of this project to assure adequacy of the project QA program and its implementation.

### Positive Activities

- o TBEG has in place formal QA procedures, plan, and manual.
- o Computer model verification and qualification procedures have been well documented and established.
- o Peer review process has been established and well documented.
- o There is more QA awareness in the technical personnel.

### Deficiencies

Observation No. 1 of Audit Report No. 83-E-06 regarding the incident reporting procedures has been reissued. The details are given in Attachment 1 of this report. In addition, the audit team has noted four additional observations which are discussed below.

The audit team has also made several comments, these are discussed in Attachment 2.

### OBSERVATIONS

#### Observation No. 1

##### Deficiency

Lack of formal QA training program.

Discussion

In the MSL laboratory test procedures are being modified and changed during the testing without obtaining proper review and approval. This practice should be discouraged and all modifications and changes to test procedures should be subjected to appropriate review and approvals.

Observation No. 4

Deficiency

Lack of activity plans for the activities identified in the technical program plan.

Discussion

The technical program plan calls for several activities. However, activity plans have not been prepared for these activities nor are these activities addressed by any single activity plan. TBEG needs to review the program plan and address all the activities and tie the plans and Specific Work Instructions (SWI) together.

\* \* \* \* \*

Prepared by

B.S.R. (Ram) Murthy

Date 4/15/84

Approved by

R. B. (Ram) Lahoti

Date 4/25/84

/var

Discussion

Since the last DOE audit, TBEG has developed and issued the QA plan, procedures, and other applicable QA program documents. A formal QA training program to the TBEG staff for implementation and compliance to these documents has not been conducted.

Observation No. 2

Deficiency

Lack of an aggressive indepth audit program.

Discussion

TBEG needs to conduct more indepth and aggressive internal audits on their internal activities such as MSL, core facility, field activities, etc. At present TBEG is conducting audits which do not go into details nor compliance to all the requirements of NQA-1. TBEG needs to conduct more compliance audits to procedures and NQA-1 requirements.

Observation No. 3

Deficiency

Lack of review and approval on modifications and changes to test procedures.



Observation No. 1  
(from Audit Report No. 83-E-06)

Deficiency

There is a lack of incident reporting procedures.

Discussion

TBEG has not issued procedures for reporting incidents to DOE as required by QA specifications. However, a draft procedure is in place and TBEG is submitting the IR's in a timely manner. The procedure needs to be formally issued.

Comments

- (1) The organization charts need to be revised to show the current structure and key personnel.
- (2) The procurement documents should contain a right of access clause for audits.
- (3) The receipt inspection of the equipment should be formally documented by appropriate technical personnel than by sign off by the QA specialist.
- (4) Labeling practices on the water sample bottles should be standardized.
- (5) TBEG needs to formally document the qualifications and certifications of core inspection personnel working at WSL facilities.

Teek



Department of Energy  
Chicago Operations Office  
Salt Repository Project Office  
505 King Avenue  
Columbus, Ohio 43201-2693

May 14, 1984

J. B. Robertson  
Hazardous Waste Hydrology  
U.S. Geologic Survey  
MS 410, National Center  
Reston, Virginia 22092

Dear Mr. Robertson:

SUBJECT: SRPO QA AUDIT OF USGS'S SALT REPOSITORY PROJECT (SRP)

Attached is the Audit Report for the quality assurance (QA) audit conducted by DOE's Salt Repository Project Office (SRPO) on March 29-30, 1984. As stated in the audit report, the main purpose of this audit was to verify the corrective action taken by USGS on last year's DOE surveillance conducted in September 1983.

The results of the audit indicated that some improvement has been made in USGS's QA program since the last DOE QA surveillance conducted in September 1983. Several positive activities were noted and are mentioned in the audit report. However, continued effort is needed to bring the QA program up to an effective level of operation.

This audit report contains three observations in the areas of organization, training, procedures, and audits.

Project personnel should review and evaluate all observations and provide DOE with an assessment and schedule for implementation of corrective action within 30 days of receipt of this letter.

The cooperation and responsiveness of your personnel during the conduct of the audit are appreciated.

J. B. Robertson  
Page 2

If you have any questions concerning the QA audit, please contact me at  
(614) 424-5916, Ext. 14.

Sincerely,

A handwritten signature in black ink, appearing to read "R B Lahoti", with a horizontal line underneath the name.

Ram B. Lahoti  
Manager  
Quality Assurance  
Salt Repository Project Office

SRPO:RBL:2354B

ST# 511-84

Enclosure:  
As Stated

cc: C. Williams, Jr., BPMD  
R. Murthy, BPMD  
A. LaSala, USGS/SRPO  
P. Bussolini, LANAL  
J. Sherwin, USGS  
T. Baillieu, USGS

QUALITY ASSURANCE AUDIT  
of  
USGS SALT REPOSITORY PROJECT  
(BPMD ID E530-00200)  
at  
U.S. GEOLOGIC SURVEY (USGS)  
Denver (West), Colorado

AUDIT PURPOSE AND SCOPE

This report contains the results of the quality assurance audit of the subject project conducted on April 5-6, 1984. The purpose of the audit was to review USGS's quality assurance program established for this project and to verify the implementation of the corrective action to DOE's Surveillance Report No. 83-S-17.

The scope of the audit included a review of operations, equipment, and activities which are located at the Denver (West) facility. The review mainly included the activities pertaining to surface resistivity investigations.

AUDIT PARTICIPANTS

Audit Team Members

Ram Lahoti	- SRPO QA Manager (Lead Auditor)
Ram Murthy	- ONWI Lead QA Specialist (Auditor)
Tilak (Teek) Verma	- NRC Representative (Observer)
J. A. Sherwin	- SRPO (Chief of Site Exploration Branch (Observer)
Al LaSala	- SRPO/USGS Representative (Observer)
Tom Baillieu	- SRPO Project Manager (Observer)

Principal Contractor Personnel Contacted

E. Roseboom - USGS (Reston, Virginia)  
J. Daniels - USGS Geophysics Branch (Denver, Colorado)  
P. Bussolini - LANL/USGS QA (Denver, Colorado)  
J. Wilmon - USGS (Denver, Colorado)  
L. Kersteins - LANL/USGS QA (Denver, Colorado)

SUMMARY

A review of the program indicated that the project is still in its early stages of planning. No definite schedules have been established for field work.

USGS' QA program still needs to be developed and formally implemented. The implementation of corrective action on the comments made in the previous surveillance report is still being done. Therefore, the comments have been reissued as observations. The team also has noted a few positive activities which are discussed in this report.

It should be recognized that deficiencies may exist other than those cited in the report, particularly in areas not examined by the audit team. Therefore, your organization should continue to review and audit all aspects of this project to assure adequacy of the project QA program and its implementation.

Positive Activities

- o USGS has developed and issued a quality assurance plan for nuclear waste storage investigations.

- o USGS has developed and issued some QA procedures and unit task procedures while several procedures are in draft stage.
- o There is more awareness of quality assurance program and cooperation among the technical staff assigned to this project.

### OBSERVATIONS

#### Observation No. 1

##### Deficiency

Lack of formal organization chart or QA training program.

##### Discussion

USGS must establish a plan showing the organization and personnel working on the SRP project (i.e., the work done by Bob Hites' group, Jeff Daniels' group, etc.). These personnel must be given formal QA training to the QA program documents.

#### Observation No. 2

##### Deficiency

Lack of approved, QA procedures.

##### Discussion

Several important QA procedures such as peer review, auditing, computer software, etc., are still in a draft stage and have not been issued. All QA procedures must be expedited to aid the implementation of the QA program.

Observation No. 3

Deficiency

Lack of formal QA audits and schedules.

Discussion

No formal quality assurance audits have been conducted nor scheduled to date on this project. USGS QA personnel must schedule and conduct quality assurance audits on the various project activities (e.g., Bob Hites' activities, Jeff Daniels's activities, etc.)

\* \* \* \* \*

Prepared by B.S.R. (Ram) Murthy Date 4/26/84

Approved by R.B. Lahoti Date 5/7/84

/var



REC'D MAY 24 1984

## DISTRIBUTION

### Battelle

S. Goldsmith  
WA Carbeiner  
NE Carter  
JF Kircher  
SK Gupta  
TL Steinborn  
DM Dawson  
JL Means  
B. Archer  
WE Newcomb  
RN Helgersen  
~~PL Archer~~  
OE Swanson  
TG Naymik  
MA Deyling  
DL Ballmann  
GE Heim  
SS Nelson  
SC Adams  
CS Kuntz  
JB Moody  
JO Duguid  
DE Clark  
SJ Basham  
JS Treadwell  
GE Raines  
VS McCauley  
N. Hubbard  
GEO Files  
ONWI Files  
LB

### DOE-SRPO

JA Sherwin  
T. Baillieu(3)  
J. Jones

### SWEC

EM Washer  
L. Picking  
S. Bair

### USGS

A. LaSala

### Contractors

A. Zaikowski/Bendix  
D. Langmuir/Colorado School of Mines  
P. Knauth/Arizona State University  
J. Laul/Battelle/PNL  
C. Jones/Bendix

### TBEG

C. Kreidler

### Consultants

A. Freeze/ERG  
K. Krauskopf/GRG  
E. Remson/GRG

	Name	Initials	Date
Originator	N. Hubbard	N.H.	23 May 84
Concurrence	B. Archer	B.A.	5/23/84
Approved	S. Goldsmith	[Signature]	5/24/84

No. \_\_\_\_\_

Internal Distribution

See Attachment

Date: May 22, 1984

To: Distribution

From: Bernard Archer

Subject: Discussion Meeting: Results of Hydrochemical and Isotopic Hydrology Characterization of Palo Duro Deep basin Brines, Texas Panhandle

On June 5, 1984, in the Program Control Center (PCC), Norman Hubbard of the Geology Functional Area-ONWI and contractors will present their results and current interpretations of chemical and isotopic data for deep basin brines collected from the four DOE deep hydroholes (Sawyer #1, Mansfield #1, Zeeck #1, and J. Friemel #1) in the Palo Duro Basin, Texas Panhandle. Also included will be chemical and isotopic data about the hydrology of Palo Duro salt.

The presentations will start with an executive summary, which will be followed by a series of presentations on specific topics. These topical presentations will be in technical layman's language and intended to give persons from ONWI, DOE, SWEC, USGS, etc, a much greater depth of information than provided by the executive summary. The meeting will close with a summary of major observations about results presented, agreements/disagreements about interpretations and relevance to licensing salt sites. See attached agenda for list of topical presentations.

On June 6 and 7 there will be a workshop for the authors of reports covering the topical presentations. The major goal of this workshop is to achieve consistency of interpretation, or multiple working hypothesis, across the diverse data of this multi-disciplinary characterization.

### Background

NRC regulations require the acquisition and interpretation of hydrochemical and isotope hydrological data for the regional geohydrological system in which a site is located and for the site itself. For salt sites, physical, chemical, and technological factors cause the logical separation of this task into characterization of the shallow, potable aquifers and the deep basin brine aquifers. There is a large body of information available about the methodologies of characterizing and monitoring potable aquifers for environmental and geochemical investigations.

MEMORANDUM

To: Distribution  
From: Bernard Archer

2

May 22, 1984

Deep basin brine aquifers have never been characterized in the detail required for NRC licensing. The results presented are ONWI's pilot project in learning how to characterize deep brine aquifers at all potential salt sites. For some years ONWI has had generic plans for characterizing deep basin brine aquifers. The first opportunity to employ and evaluate the methodologies considered appropriate has been in the Palo Duro Basin.

NH/BA:y1h

Attachment

## AGENDA

### Discussion Meeting: Results of Hydrochemical and Isotope Hydrology Characterization of Palo Duro Deep Basin Brines

PCC, ONWI, Columbus, Ohio  
Tuesday, June 5, 1984, 8:30 a.m.

<u>TIME</u>	<u>SUBJECT/PRESENTER</u>
8:30 - 8:45	Introduction and Statement of Purpose - Bernard Archer, Battelle Project Management Division
8:45 - 9:15	Executive Summary of Results - Norman Hubbard, Battelle Project Management Division
9:15 - 9:30	Discussion and Question/Answer Session
9:30 - 10:00	Isotope Hydrology of Palo Duro Deep Basin Brines: Delta Deuterium and Delta 18 Oxygen Data - Paul Knauth, Arizona State University
10:00 - 10:30	Ditto, But Rare Gas Data - Anthony Zaikowski, Bendix Field Engineering Corporation
10:30 - 10:45	Break
10:45 - 11:15	Radiometric Dating of Palo Duro Deep Basin Brines- Norman Hubbard, Battelle Project Management Division
11:15 - 11:45	Ca, Sr, Ra Solubilities in Palo Duro Brines - Donald Langmuir, Colorado School of Mines
11:45 - 12:15	The Behavior of Natural U, Th, and Ra Isotopes in Palo Duro Deep Basin Brine Aquifers - J. C. Laul, Battelle/Pacific Northwest Labs
12:15 - 1:15	Lunch
1:15 - 1:45	Natural Organics in Palo Duro Deep Basin Brines - Jeffery Means, Battelle Columbus Labs
1:45 - 2:15	Isotope Hydrology of Palo Duro Salt: Origin of Water in Fluid Inclusions in Halite - Paul Knauth, Arizona State University
2:15 - 2:45	Chemical Composition of Brines in Fluid Inclusions, Water Soluble Fraction of Salt and Deep Basin Brines - Norman Hubbard, Battelle Project Management Division
2:45 - 3:15	Results of BEG Investigators on Brines From Sawyer, Mansfield, Zeeck, and J. Friemel Wells - Charles Kreidler, Bureau of Economic Geology, Texas
3:15 - 3:30	Break

## AGENDA (continued)

3:30 - 4:30 Discussion Between Presenters and ONWI, DOE, SWEC, and  
USGS Persons Present

4:30 - 5:30 Summary of Major Observations About Results Presented, Agreements/Disagreements About Interpretations and Relevance to Licensing Salt Sites