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MAY 6 1984

Mr. Jeff O. Neff
Program Manager
Salt Repository Project Office
U. S. Department Of Energy
505 King Avenue
Columbus, OH 43201

Dear Mr. Neff:

SUBJECT: NRC HYDROLOGY DATA REVIEW

As we discussed on March 30, 1984, I am sending you a list of additional documents (Enclosure 1), our summary data inventory in hydrology (Enclosure 2), and a list of questions about hydrology data (Enclosure 3). It appears from their titles that the additional documents contain data relevant to understanding groundwater flow systems; therefore, we would appreciate having these reports available to us during the hydrology data review.

The enclosed summary data inventory is preliminary in form and content. We intend to develop it further with the results of our data review together with detailed reviews of additional documents, the draft EA's, the information sheets and discussions with the salt states. It would be very usefuleto us if the data overview presentations given by your staff could point out omissions or corrections in our summary data inventory and address our data questions. In this way we would develop a better understanding of the available data from all sources.

We appreciate the preparations and the staff arrangements you are making for this data review and look forward to a mutually beneficial exchange.

WM Record File 106
WM Project 16
Docket No.
PDR ✓
LPDR ✓
Distribution:
(Return to WM, 623-SS) C2

Sincerely,

"ORIGINAL SIGNED BY"

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

Enclosures:
1. List of Additional Documents Relating to Hydrology
2. Summary Data Inventory - Hydrology
3. Hydrology Data Questions

OFFICE	cc: T. Verma, NRC L. Casey, DOE/SRPO					
SURNAME	RJ					
DATE	5/4/84					00550

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PDR WASTE
WM-16 PDR

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-960

Enclosure 1 List of Additional Cocuments

Bair, E.S., O'Donnell, T.P., and Picking, L.W., 1984. Hydrogeologic Investigations Based on Drill-Stem Test Data, Palo Duro Basin Area. Texas and New Mexico: ONWI/SUB/84/E512-05000-T14.

Smith, P.G., 1983. Modeling the Deep Basin Hydrogeology of a Potential High -Level Radwaste Site in Texas: SWEC TP83-133.

Stone & Weber Engineering Corporation, 1983. Ogallala Aquifer Mapping Program, Topical Report, Revision 1: ONWI/SUB/83/E512-05000-T16.

Smith P.G., 1984. Permeability Measurements from Drill-Stem Test Data and Other Sources, Palo Duro Basin Area, Texas and New Mexico: ONWI/SUB/84/E512 05000-T ___, in preparation.

INTERA, 1982. Status Report in Regional Groundwater Flow Modeling for the Pal Duro Basin, Texas, ONWI/E512-02900/TR-13, p 170.

Stone & Webster Engineering Corporation, 1983b. Investigations Based on Drill-Stem Test Data, Palo Duro Basin Area, Texas and New Mexico, BWI/ONWI-xxx, prepared for Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH, July draft. (This may be the source as Bair, et, al. above)

INTERA Environmental Consultants, Inc., 1984b. First Status Report on Reginal Groundwater Flow Modeling for the Palo Duro Basin, Texas, BMI/ONWI-504, prepared for Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH.

INTERA Environmental Consultants, Inc., 1984b. Second Status Report on Regional Ground-Water Flow Modeling for Palo Duro Basin, Texas, BMI/ONWI-503, prepared for Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH, October, 1983, draft.

Resource Engineering, Inc., 1983 Laboratory Testing of Rock and Salt.

incHulty#1 incCauly #2 Vafai, K., 1984, Expected Nuclear Waste Repository Near-Field Performance in three Salt Formations, Pt 3, Solid-State Radionuclide Transport, BMI/ONWI — Also Pt 1, Thermal and 2 Brine migrat

SWEC 1983, 1984, Wolfcamp Potentiometric Surface After Culling Depressured, Overpressured, and Underpressured Data, Palo Duro Basin, Geotechnical Sketch. 13697-37-H-1. 13697-37 E-1

SWEC, 1983, Geotechnical Profile - Detten No. 1 - G. Friem No. 1, Geotechnical Sketch 13697-G (B)-29.

SWEC, 1983, Geotechnical Sketch 13697-37-C-1 Inferred Faults in Northern Palo Duro Basin

SWEC, 1983, Zone of Dissolution of the Lower San Andres Unit 4 Salt; Sketch No. 13697-37-D-1.

SWEC, 1983, Thickness of Thick Salt Bed in Lower San Andres Unit 4 in Northern Palo Duro Basin; Sketch 13697-36-4-2.

Sewell, M.J., 1984, Summary of Chemical and Isotopic Data Produced by Bendix Field Eng. Corp. for Mansfield #1, Zeeck #1, Sawyer #1, and Friemel #1 wells in the Texas Panhandle, ONWI Technical Rpt, Tables 1 and 4.

SWEC, 1983, Pennsylvanian Potentiometric Surface After Culling Depressured, Overpressured, and Underpressured Data in Northern Palo Duro Basin: Sketch 13697-37-F-1.

Earth Technology, 1984, Ref. 3 Technical Memo from M. Bitner to M. Teubner, EW-ONWI-84-5258, pp. 1-10.

Entera, April 1983, Status Report on Regional Groundwater Flow Modeling of the Vacherie Dome, La. ONWI/81-E512-02900/TR-20

Following documents from the March, 1984 Catalog

Cycle/catalog #			
1.	0-1171	9.	0-1193
2.	0-1172	10.	0-1175
3.	0-1173	11.	0-1246
4.	0-1174	12.	0-1252
5.	0-1231	13.	0-1176
6.	0-1263	14.	0-1293
7.	0-1287	15.	0-1294
8.	0-1307	16.	0-1256

DATA

03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1171

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 105

BASIN: PERMIAN

TITLE: OGALLALA AQUIFER MAPPING PROGRAM

SUMMARY: THIS REPORT PRESENTS A SERIES OF MAPS GENERATED FOR THE OGALLALA AQUIFER INCLUDING RECENT AND PAST WATER LEVELS, THICKNESS, SATURATED THICKNESS AND CONTOUR MAP OF THE BASE OF OGALLALA.

PLANNED REVIEWS: ONWI-INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/30/84

FORM OF DOCUMENT: ANALYSIS REPORT

DATE DISTRIBUTION WAS MADE TO THE PUBLIC:

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1172

WBS NUMBER: 1.3.3.3.2

DWMT PROJECT MANAGER: DEYLING 104

BASIN: PERMIAN

TITLE: POTENTIOMETRIC DATA FOR NEW MEXICO AND TEXAS

SUMMARY: THIS REPORT IS A DESCRIPTION OF THE DATA BASE WHICH HAS BEEN DEVELOPED FROM DRILL STEM TESTS. IT DESCRIBES FORMATION PRESSURE DATA AND GENERATES POTENTIOMETRIC SURFACE MAPS FOR THE WOLFCAMP AND PENNSYLVANIAN CARBONATE AQUIFERS.

PLANNED REVIEWS: DWMI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/01/84

FORM OF DOCUMENT: ANALYSIS REPORT

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03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1173

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 50

BASIN: PERMIAN

TITLE: PUMP TESTS AND FLUID SAMPLING AT J. FRIEMEL NO. 1, DEAF SMITH CO., TEXAS

SUMMARY: PUMPING TESTS FOR ZONE 1 (A PRESSURE RECOVERY TEST AND A PRESSURE DRAWDOWN TEST) WERE COMPLETED. FLUID WAS SAMPLED FOR ANALYSES LEADING TO DETERMINATIONS OF THE BEHAVIOR OF SOME RADWASTE RADIONUCLIDES IN THIS GROUND-WATER/ROCK SYSTEM.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: BENDIX-GJ

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/01/84

FORM OF DOCUMENT: ANALYSIS REPORT

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1174

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 40

BASIN: PERMIAN

TITLE: DISSOLUTION ZONE WELL FLUID SAMPLING AT MANSFIELD NO. 1, OLDHAM CO., TEXAS

SUMMARY: THIS REPORT EVALUATES FLUID SAMPLED FOR ANALYSES LEADING TO DETERMINATION OF THE BEHAVIOR OF SOME RADWASTE RADIONUCLIDES (U, TH, RA) IN SUCH GROUND WATER AND, POSSIBLY, INFORMATION ON THE AGE OF THE GROUND WATER.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: TEXAS BEG

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 04/30/84

FORM OF DOCUMENT: ANALYSIS REPORT

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: C-1231

WBS NUMBER: 1.3.1.3

ONWI PROJECT MANAGER: GUPTA 148

BASIN: GENERIC

TITLE: NATURAL SALT DISSOLUTION - DEAF SMITH, PALO DURO BASIN: RICHTON DOME, GULF COAST: AND DAVIS CANYON, PARADOX BASIN

SUMMARY: COMPILATION AND INTERPRETATION OF NATURAL SALT DISSOLUTION INFORMATION ON THREE POTENTIAL SALT SITES IS PRESENTED. THE BASIS FACT THAT THE NATURAL SALT DEPOSITS HAVE BEEN IN EXISTENCE FOR MILLIONS OF YEARS SHOW THAT THE NATURAL SALT DISSOLUTION, IN GENERAL, IS A VERY SLOW PROCESS. DUE TO LOW RATES OF DISSOLUTION, THE RATES ARE PRIMARILY BASED ON AVAILABLE GEOLOGIC INFORMATION.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: ONWI

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/30/84

FORM OF DOCUMENT: ANALYSIS REPORT

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03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1263

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: HUME 175

BASIN: PERMIAN

TITLE: MANSFIELD DETTEN TESTS REPORT

SUMMARY: THIS REPORT CONTAINS LABORATORY TESTING DATA ON CORE FROM THE MANSFIELD NO. 1 AND DETTEN NO. 1 WELLS.

PLANNED REVIEWS: ONWI INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/15/84

FORM OF DOCUMENT: ANALYSIS REPORT

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1287

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 200

BASIN: PERMIAN

TITLE: WOLFCAMP CROSS SECTIONS - DEAF SMITH COUNTY AREA: UNANALYZED DATA

SUMMARY: THIS REPORT PRESENTS GEOLOGIC CROSS SECTION GIVING A DETAILED LITHOGIC BREAKDOWN OF THE WOLFCAMP CARBONATE IN DEAF SMITH COUNTY, TEXAS.

PLANNED REVIEWS: ONWI INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/30/84

FORM OF DOCUMENT: DATA REPORT

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CYCLE/CATALOG NUMBER: D-1287

NAME _____

AFFILIATION _____

ADDRESS _____

_____

DATA

03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1307

WBS NUMBER: 1.3.2.3

ONWI PROJECT MANAGER: CLARK 221

BASIN: GENERIC

TITLE: UPDATED GEOCHEMICAL TEST CONDITIONS

SUMMARY: ONWI WILL ISSUE A REPORT ON THE NEAR-FIELD TEST CONDITIONS FOR A SALT REPOSITORY. IT WILL INCORPORATE THE LATEST DATA AVAILABLE TO DEFINE THE GEOLOGIC, PETROLOGIC, HYDROLOGIC, AND THERMOMECHANICAL PROPERTIES OF SALT ON A SITE-SPECIFIC BASIS.

PLANNED REVIEWS: ONWI INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: ONWI

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/31/84

FORM OF DOCUMENT: ANALYSIS REPORT

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AFFILIATION _____

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_____

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DATE

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1193

WBS NUMBER: 1.3.3.3.3

ONWI PROJECT MANAGER: GUZZETTA 84

BASIN: PERMIAN

TITLE: HYDROLOGIC CHARACTERISTICS OF TWO STUDY LOCATIONS IN DEAF SMITH AND SWISHER COUNTIES

SUMMARY: THIS STUDY DESCRIBES SURFACE HYDROLOGIC CHARACTERISTICS INCLUDING TOPOGRAPHY, DRAINAGE, WATER RESOURCE PROJECTS, SOILS, LAND USE, PRECIPITATION AND RUNOFF PATTERNS, AND SURFACE WATER QUALITY.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: NUS CORP

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 05/30/84

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: 0-1175

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 111

BASIN: PERMIAN

TITLE: GAS SAMPLING FOR GROUND-WATER DATING AT THE J. FRIEMEL NO. 1 WELL, ZONE NO. 1

SUMMARY: THIS REPORT IS A DESCRIPTION OF DOWNHOLE PRESSURIZED FLUID SAMPLES TAKEN FROM THE DEEP #GRANITE WASH# AQUIFER.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: BENDIX-GJ

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

FORM OF DOCUMENT: ANALYSIS REPORT

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DATA

03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: 0-1246

WBS NUMBER: 1.3.3.2.4

ONWI PROJECT MANAGER: DEYLING 98

BASIN: PERMIAN

TITLE: PUMPING TEST AND FLUID SAMPLING REPORT, MANSFIELD NO. 1 WELL, PALO DURO BASIN: UNANALYZED DATA

SUMMARY: THIS REPORT DESCRIBES THE PUMPING TEST AND FLUID SAMPLING ACTIVITIES TO COLLECT DATA TO DETERMINE THE HYDROLOGIC CHARACTERISTICS OF DEEP WATER BEARING FORMATIONS AND TO OBTAIN FORMATION FLUID SAMPLES FOR ANALYSES TO EVALUATE FLUID MIGRATION AND AGE RELATIONSHIPS IN THE PERMIAN BASIN.

PLANNED REVIEWS: ONWI-INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

FORM OF DOCUMENT: DATA REPORT

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CYCLE/CATALOG NUMBER: 0-1246

NAME _____

AFFILIATION _____

ADDRESS _____

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03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1252

WBS NUMBER: 1.3.3.2.4

ONWI PROJECT MANAGER: DEYLING 29

BASIN: PERMIAN

TITLE: FORMATION-PRESSURE DATA FILE: TEXAS AND NEW MEXICO: UNANALYZED DATA

SUMMARY: THIS REPORT CONTAINS GEOLOGIC, HYDROLOGIC AND FORMATION PRESSURES FOR VARIOUS LOCATIONS IN THE PALO DURO BASIN ALONG WITH A COMPUTER LISTING OF DRILL STEM TEST DATA.

PLANNED REVIEWS: ONWI-INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

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CYCLE/CATALOG NUMBER: D-1252

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03/84

SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: D-1293

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 207

BASIN: PERMIAN

TITLE: PUMPING TEST AND FLUID SAMPLING REPORT: UNANALYZED DATA

SUMMARY: THE REPORT WILL DETAIL RESULTS OF AQUIFER TESTS AND FLUID SAMPLING AT THE J. FRIEMEL NO. 1 IN DEAF SMITH COUNTY, TEXAS.

PLANNED REVIEWS: ONWI INTERNAL, DOE/SRPO, PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

FORM OF DOCUMENT: DATA REPORT

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CYCLE/CATALOG NUMBER: D-1293

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: 0-1294

WBS NUMBER: 1.3.3.3.2

ONWI PROJECT MANAGER: DEYLING 208

BASIN: PERMIAN

TITLE: FORMATION PRESSURE ANALYSIS REPORT - TEXAS AND NEW MEXICO

SUMMARY: THE REPORT DISCUSSES FORMATION PRESSURE DATA DERIVED FROM DRILL STEM TEST RESULTS IN TEXAS AND NEW MEXICO.

PLANNED REVIEWS: ONWI INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: STONE + WEBSTER

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/01/84

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: 0-1256

WBS NUMBER: 1.2.3.5.2

ONWI PROJECT MANAGER: GIBBONS 112

BASIN: GULF COAST

TITLE: MISSISSIPPI SEISMIC INTERPRETATION STATUS REPORT

SUMMARY: THIS REPORT WILL SUMMARIZE ALL OF THE SEISMIC REFLECTION DATA INTERPRETATION TO DATE IN MISSISSIPPI FOR THE CRWM PROGRAM. EMPHASIS IS PLACED ON THE AREA NEAR RICHTON DOME.

PLANNED REVIEWS: ONWI-INTERNAL,DOE/SRPO,PATENT REVIEW

ORIGINATOR OF DATA: ERTEC WESTERN INC

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

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SALT REPOSITORY PROJECT

PRODUCT DESCRIPTION SHEET

CYCLE/CATALOG NUMBER: 0-1176

WBS NUMBER: 1.3.3.5.2

ONWI PROJECT MANAGER: KUNTZ 48

BASIN: GULF COAST

TITLE: CAPROCK AND ITS ROLE IN THE HYDROLOGIC INTEGRITY OF THE DOME

SUMMARY: THIS REPORT PRESENTS A COMPILATION OF ALL STUDIES OF OAKWOOD AND OTHER EAST TEXAS DOME CAPROCK, ITS FORMATION, EXTENT AND ROLE IN ISOLATING GROUND WATER FROM THE SALT STOCK.

PLANNED REVIEWS: ONWI-INTERNAL, DOE/SPRO, PATENT REVIEW

ORIGINATOR OF DATA: TEXAS BEG

DATE DISTRIBUTION IS PLANNED TO THE PUBLIC: 07/30/84

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Enclosure 2 Summary Data Inventory - Hydrology

PARADOX BASIN / GIBSON DOME

Type of Data : Rock sample Laboratory Tests

Data Collection Location

Areal location : Paradox Basin / Gibson Dome

Subsurface location : Paleozoic and Mesozoic Fms. & upper, middle, and lower hydrostratigraphic units

Method of collection / analysis : Borehole Core (GD-1)
Lab testing procedure not described !

Amount of data : 60 samples / 103 tests
Porosity, Hydraulic conductivity, and permeability

Data sources : Woodward Clyde

Data documented : ONWI 388 ?

Data storage location : Woodward Clyde Project Files

Data related uncertainties :

9/3/84

Type of Data : Potentiometric / Formation Field tests (DST's)

Data Collection Location

Areal location : Paradox Basin – Regional, Lisbon Valley, Salt Valley, Elk Ridge, and Gibson Dome

Subsurface location : various Mesozoic and Pakeozoic Fms. within the upper, middle, and lower hydrostratigraphic units ; and above the upper hydrostratigraphic unit

Method of collection / analysis : Drill Stem Tests / horner plots

Amount of data : ≈ 240 DST's from numerous wells data includes measured transmissivity, approx measured permeability, Equivalent hydraulic conductivity, and potentiometric level.

Data sources : Oil Companies & other sources

Data documented : ?
ONWI - 290

Data storage location : Woodward Clyde Paradox Basin Project Files

Data related uncertainties : data has not been seen or evaluated by NRC staff

Type of Data : Hydrostratigraphic data from geophysical logs

Data Collection Location

Area location : Paradox Basin

Subsurface location : Mesozoic and Paleozoic Fms. within the upper, middle and lower hydrostratigraphic units.

Method of collection / analyses : Geophysical logs

Amount of data : Logs from GDrl

Data sources : Woodward Clyde

Data documented : ONWI 388

Data storage location : Woodward Clyde

Data related uncertainties :

Type of Data : Formation Field Tests / DST's

Data Collection Location

Areal location : Paradox Basin / Gibson Dome

Subsurface location : Mesozoic and Paleozoic Fms within the upper, middle, and lower hydrostratigraphic units

Method of collection / analyses : DST'S / Horner plots

Amount of data : 18 DST'S at various depths within GD-1 borehole -

Data sources : Woodward Clyde

Data documented : OWRI - 388

Data storage location : Woodward Clyde Project Files

Data related uncertainties : apparent anomalous head values in lower hydrostratigraphic unit.

4/2/84

Type of Data : Potentiometric / Formation Field tests (DST's)

Data Collection Location

Areal location : Paradox Basin – Regional, Lisbon Valley, Salt Valley, Elk Ridge, and Gibson Dome

Subsurface location : Various Mesozoic and Pakozoic Fms. within the upper, middle, and lower hydrostratigraphic units ; and above the upper hydrostratigraphic unit

Method of collection / analyses : Drill Stem Tests / horner plots

Amount of data : ≈ 240 DST's from numerous wells data includes measured transmissivity, approx measured permeability, Equivalent hydraulic conductivity, and potentiometric level.

Data sources : Oil Companies & other Sources

Data documented : ?
ONWI-290

Data storage location : Woodward Clyde Paradox Basin Project Files

Data related uncertainties : data has not been seen or evaluated by NRC staff

4/3/84

Type of Data: Groundwater Quality (basic analyses)

Data Collection Location

Areal location: Paradox Basin, various locations throughout entire basin including Gibson Dome

Subsurface location: designated Paleozoic and Mesozoic fms within the lower, middle, and upper hydrostratigraphic units; ~~in base upper hydrostratigraphic unit~~

Method of collection/analyses: Drill stem tests, swabbing, other oil well sample such as those from the separator tank, water well, spring, and mine water

Amount of data: 340 sampling locations within the Basin

Data sources: Oil companies, USGS, State of Utah, Woodward Clyde, various investigations

Data documented: See ~~Appendix A~~, Table A-2, Part II of ONWI-290

Data storage location: Woodward Clyde Paradox Basin Project Files

Data related uncertainties: data is contained in various reports which have not been obtained and reviewed at this time.

Table A-1

(d) DATA SOURCE CODE

Abbreviation	
Champlin Oil Company, Denver, Colorado, Analysis forwarded by John Verin, 6/10.81	CPN
Connor, J.G., and Mitchell, C.G., 1958, A compilation of chemical quality data for ground and surface waters in Utah: Utah State Engineers Technical Publication, No. 10, p. 1-135.	C.M
Feltis, R.D., 1966, Water from bedrock in the Colorado Plateau of Utah: Utah State Engineers Technical Paper No. 15, United States Geological Survey	FEL
Hanshaw, B.B, and Hill, G.A., 1969, Geochemistry and hydrodynamics of the Paradox Basin Region, Utah, Colorado, and New Mexico: Chemical Geology v. 4, p. 263-294.	H.H
Huntoon, P.W., 1979, The occurrence of ground water in the canyonlands area of Utah, with emphasis on water in the Permian section: Four Corners Geological Society Guidebook, 9th Field Conference, Permianland	HUN
Iorns, W.V., Hembree, C.H., Phoenix, D.A., and Oakland, G.L., 1964, Water resources of the upper Colorado River Basin - basic data: United States Geological Survey Professional Paper 442, p. 712-743.	IHP
Mayhew, E.J., and Heylmun, E.B., 1961, Complex salts and brines of the Paradox Basin, Second symposium on salt: v. i, Jon L. Rau, editor.	M.H
Mayhew, E.J., and Heylmun, E.B., 1965, Concentrated subsurface brines in the Moab region, Utah: Special Study 13	M.H
Ritzma, H.R., Doelling, H.H., (eds.), 1969, Mineral resources, San Juan County, Utah, and adjacent areas: Utah Geological and Mineralogical Survey Special Studies, no. 24, Part I, 125 p.	R.D
Utah State Division of Health	UST
* WCC Paradox Basin Project Files	FIL
Field Samples collected by WCC for this study	WCC

PALO DURO BASIN

Type of Data : Hydrostratigraphic Data from Geophysical Logs

Data Collection Location

Areal location : Palo Duro Basin / see attached map

Subsurface location : various depths within basin.

Method of collection / analysis : geophysical log

Amount of data : 2,280 data points / 4,500 well logs

Few logs with basin interior – salinity from Spontaneous Potential logs, see attached data

Data sources : Oil Companies

Data documented : TBEG Annual reports

Data storage location : TBEG / Austin, Txs

Data related uncertainties :

Table 1. Well names and operators corresponding to Bureau of Economic Geology numbering system. These wells are used on all cross sections in this report.

County	BEG number	Operator	Well name
Armstrong	1	Standard Oil	No. 1-A Palm
	11	Ketal Oil	No. 1 F. B. Massie-Mo.
	16	Hassie Hunt Trus.	No. 1 J. A. Cattle
	19	Texaco	No. 1 Ritchie
	22	W. V. Harlow	No. 1 Mattie Hedgecoke
	23	Burdell Oil	No. 1 McGehee Strat Test
Briscoe	20	Gulf Oil	No. D-1 Rodgers
	21	Cockrell	No. 1 Allard
	23	Amerada	No. 1 Hamilton
Castro	1	Amarillo Oil	No. 1 C. R. Veigel
	7	Union of Cal.	No. 1 Formwalt
	9	Ashmun & Hilliard	No. 1 Willis
	10	Phillips	No. 1 Morris "J"
	11	Sun Oil	No. 1 Herring
	13	Amarillo Oil	No. 1 L. C. Boothe
	14	Sun Oil	No. 1 Haberer
	15	Sun Oil	No. 1 Uselton
	16	Ashmund & Hilliard	No. 1 J. L. Merritt
	17	Standard of Texas	No. 1 Steakley
	18	Anderson-Prichard	No. 1 Fowler-McDaniel
Childress	29	Claud Hamill	No. 1 Kent McSpadde
	34	O. P. Leonard	No. 1 J. E. Turner
	37	Perkins-Prothro	No. 1 Howard
	40	R. D. Gunn	No. 1 G. B. Dorsey
	42	Kay Kimbell	No. 1 J. Rhea
	48	U. H. Griggs	No. 1 Smith
	49	Sinclair Oil	No. 1 Willard Mullins
	74	British-American Oil	No. 1 E. V. Perkins
Dallam	5	Royal Resources	No. 31 Sneed
	41	Skelly Oil	No. 1 E. J. Dixon
Deaf Smith	2	Frankfort Oil	No. 1 Allison-Hayes
Floyd	4	Lovelady	No. 1 E. E. Wells
	12	Perry Larson	No. 1 Goins
	13	Cockrell Corp.	No. 1 Karstetter
	26	Soderstrom	No. 1 Battey
	30	Standard Oil	No. 1 Minnie Adams
Hale	1	El Ray Petr.	No. 1 Whitten
	38	Henderson & Erickson	No. 1 Overton
Hall	18	Amerada Petr.	No. 1 LaFayette Hughes
	19	Midwest Oil	No. 1 Hughes
	22	R. D. Gunn	No. 1 T-Bar Ranch
	23	Robinson Bros. Oil	No. 1 Hughes
Hartley	35	Whitehall	No. 1 Reynolds Cattle
Lamb	1	Gulf Oil	No. 1 L. E. Bartlett
	3	Steve Gose	No. 1 J. E. Busby
	12	DEPCO, Inc.	No. 10 Young
	27	Vaughn Petr.	No. 1 Eva Wells
	28	R. H. Fulton	No. 1 Cowen
	35	Shell Oil	No. 1 Ivey & McCary
	59	Humble Oil	No. 1 Fowler
	102	Cherry Petr.	No. 1 Middlebrook
Moore	8	Continental Oil	No. 1 E. L. Amis
	29	Gabe D. Anderson	No. 1-24 Bennett
	43	Grady L. Fox	No. 1 Sneed
	46	Colorado Interstate	No. 36-A Masterson
Oldham	5	Shell Oil and Atlantic	No. 98-1 Fulton
	45	Shell Oil	No. 315-4 Alamosa
	58	Shell Oil	No. 1 Taylor
Parmer	8	Texaco	No. 1 Owen Patton
	10	Sunray Oil	No. 1 Kimbrough
Potter	10	Sinclair	No. 17 Bivins
	25	Bivins	No. 1 LX Shell
	41	Asarco	No. 1-29 WDW
	44	Humble	No. 1 O. H. Gouldy
Randall	1	Frankfort Oil	No. 1 H. L. Erwin
	2	Burdell Oil	No. 1 Winters
	14	Shell Oil	No. 1 Nester
	23	Frankfort Oil	No. 1 Stinnett
Swisher	1	Frankfort Oil	No. 1 Wesley
	2	L. A. Helms	No. 1 Harris
	3	Frankfort Oil	No. 1 Culton
	6	Standard Oil	No. 1 A. B. Johnson
	8	Burdell Oil	No. 1 Bradford
	9	Humble Oil	No. 1 A. B. Nanny
	10	Consolidated Gas	No. 1 Patton
	11	Consolidated Gas	No. 1 H. O. Thompson
	12	Frankfort Oil	No. 1 Sweatt
	13	Sinclair Oil	No. 1 Savage

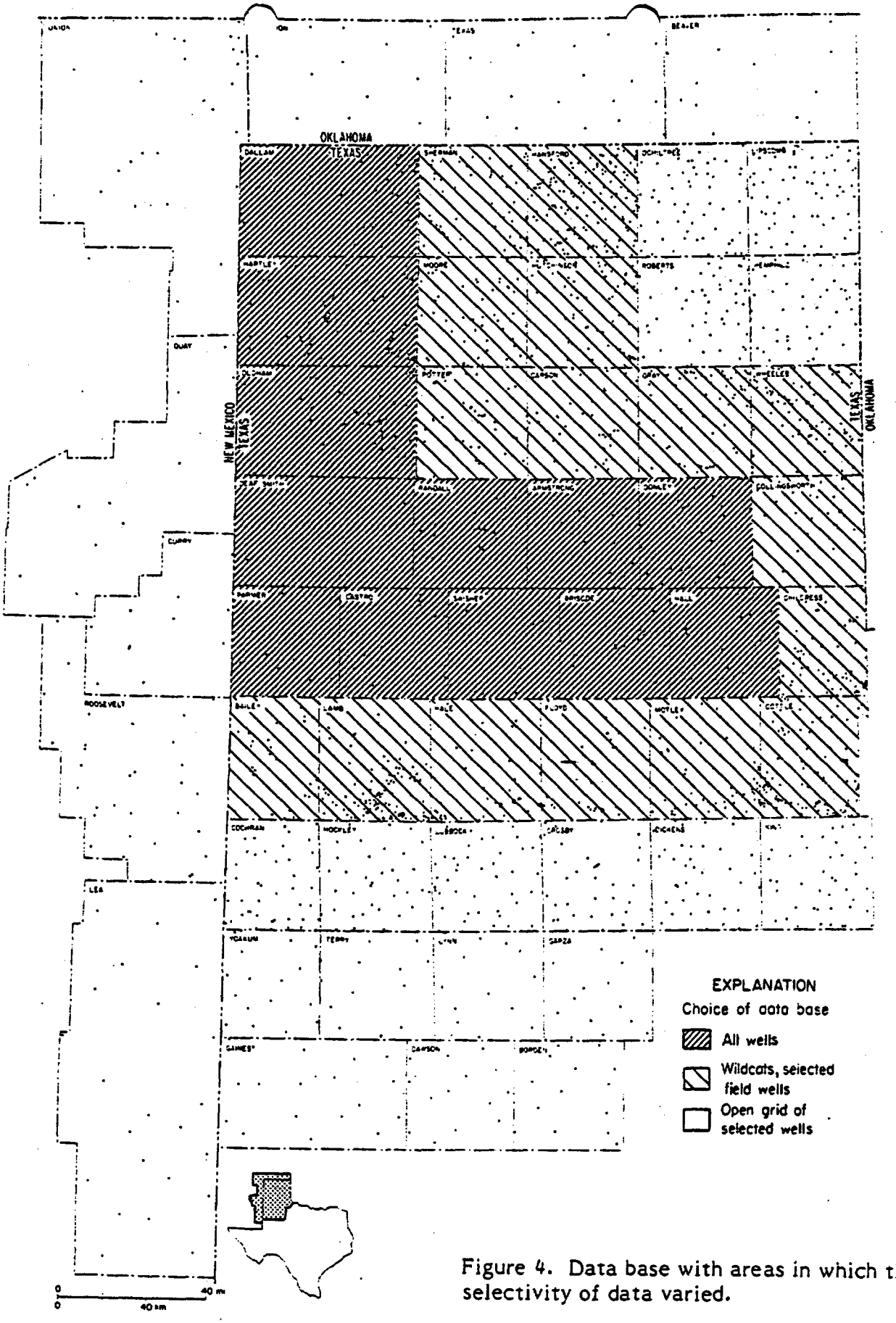


Figure 4. Data base with areas in which the selectivity of data varied.

10

Type of Data: Potentiometric Data

Data Collection Location

Areal location: Palo Duro Basin; most data for Basin margins

Subsurface location: See attached map

Method of collection/analyses: DST's

Amount of data: 100's of data points (See attached map)

Data sources: Petroleum industry

Data documented: TBEG Report of Investigations No. 130 by Bassett and Bentley

Data storage location: TBEG

Data related uncertainties:

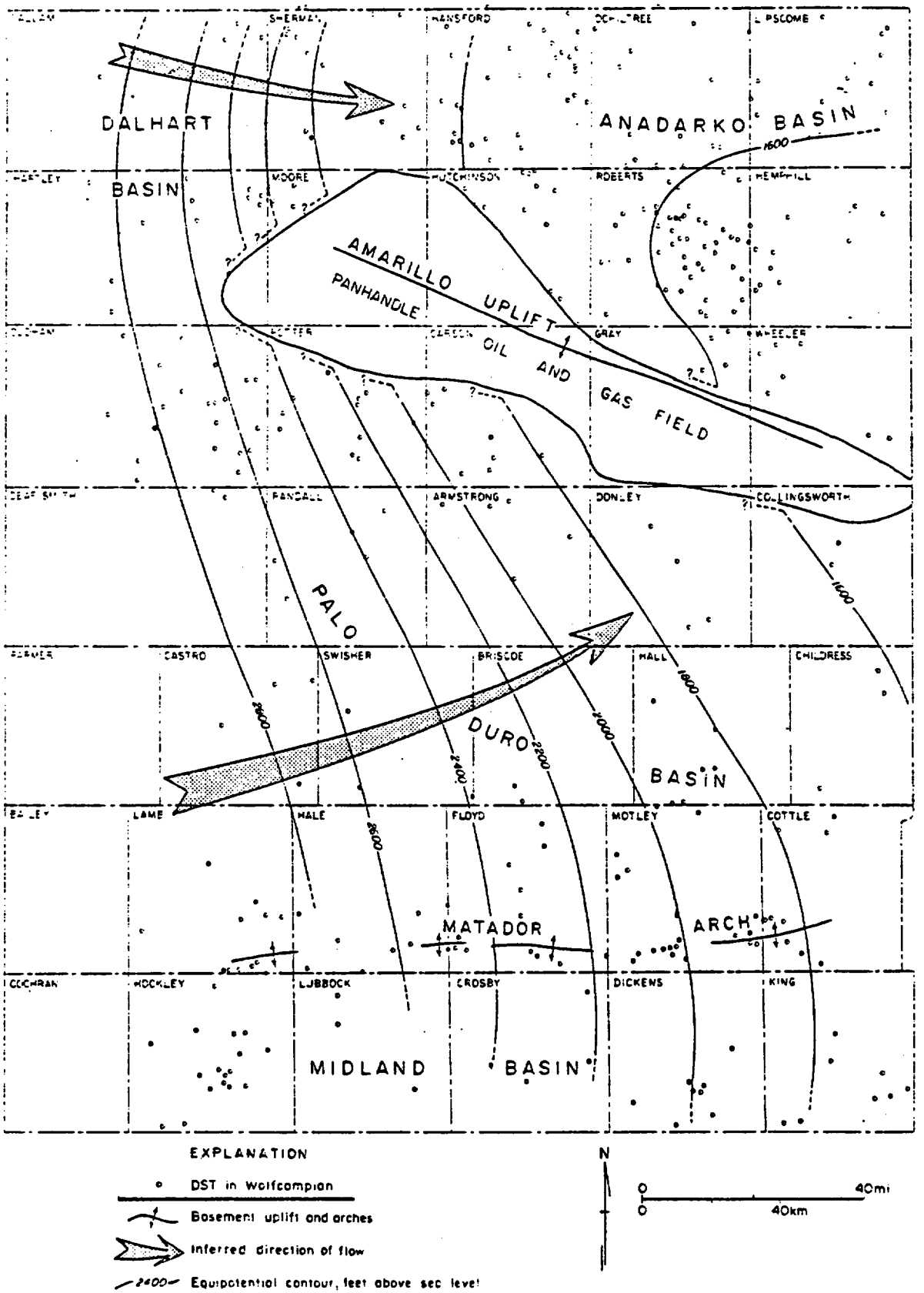


Figure 6. Hydraulic head map, Wolfcamp aquifer, Texas Panhandle. Head contours interpreted from fresh-water head values calculated from uncorrected shut-in pressures. Low head values (1,000 ft) in the Panhandle oil and gas field appear to cut across regional trends and may represent relative hydraulic isolation of eastward-drained porous strata. Well locations not shown in the Panhandle field.

12

Type of Data : Formation Field Tests / DST's

Data Collection Location

Areal location : Palo Duro Basin ; most data for basin margins

Subsurface location : Deep brine aquifer below evaporites in the granite wash and Wolfcamp carbonates

Method of collection / analyses : DST's conducted in petroleum wildcat wells and from bottom hole pressures measured in oil fields

Amount of data : 19 calculated permeability values for Wolfcamp carbonates

Data sources : Petroleum industry ; Texas Railroad Commission ; TBEG / Texas Dept. of Water Resources

Data documented : TBEG / Bassett and Bentley Rpt of Inv. No. 130 / TBEG Geological Cir. 81-3 / Texas Dept. of Water Resources Reports 98 and 213

Data storage location : TBEG, Austin Texas

Data related uncertainties : Interval test by oil companies are based on hydrocarbon shows rather than on other physical criteria such as high porosity indicated by electric logs. The most permeable parts of the deep Fms. may be untested.

Table 6. Preliminary summary of deep-basin permeability measurements.

Age	Lithology	Location	Depth (ft)	Method	No. of Analyses	Analyst or Source	Permeability (mD)	Remarks
Lower Permian (Wolfcampian)	Dolomite	Oldham Co.	5,340	DST	1	TBEG	0.9	
	Dolomite	Panhandle Field	3,000±	Various	6	TRC	to 25	Reported to TRC by operators
Pennsylvanian	Arkosic sandstone	Panhandle Field	3,002-3,140	Lab test	100	Well operator	to 1,740	
	Arkosic sandstone	Hartley Co.	6,302	DST	1	PRC	20.0	
	Limestone	Swisher Co.	8,287	DST	1	PRC	2.0	
Mississippian	Dolomite	Parmer Co.	9,326	DST	1	PRC	1.3	
Ordovician	Carbonate	Gray Co.	4,800	DST	1	PRC	2.0	

Sources of Data-- TBEG: Analysis by Texas Bureau of Economic Geology
TRC: Texas Railroad Commission
PRC: Analysis by Petroleum Research Corp., Denver

Table 7. Assumed permeability values for the major hydrologic systems, Texas Panhandle region.

Hydrologic unit	Hydraulic condition gallons/day/ft^2	Relative permeabilities
Ogallala fluvial system[1]	200	10^8
Triassic fluvial/lacustrine system[1]	20	10^6
Permian (salt dissolution zone)[2]	2	10^6
Permian sabkha system[3]	2×10^{-6}	1
Permian mudflat system[4]	.002	10^3
Permian/Pennsylvanian shelf carbonates[5]	.02	10^4
Permian/Pennsylvanian basinal system[3]	2×10^{-6}	1
Permian/Pennsylvanian fan-delta systems[5]	2	10^6

Sources of data:

1. Various reports of Texas Department of Water Resources.
2. U.S. Geological Survey open-file data.
3. See text.
4. Typical clay-silt (Freeze and Cherry, 1980).

Table A-1. Hydraulic parameters derived from an analysis of drill-stem test charts using the Horner method (1951). The selected permeability and hydraulic values are underscored in the table.

County	BEG well no.	Company	API no.	Depth tested (ft)	Thickness (ft)	K_{ISIP} (md)	K_{FSIP} (md)	H_{ISIP} (ft)	H_{FSIP} (ft)	Comments†††
Briscoe	21	Cockrell	42-045-30001	6,344-6,411	67	8.5	1.31	3,105†	2,964†	L. Wfc. shelf**
Carson	38	Shenandoah	42-065-30182	3,601-3,615	14	1.1	0.24	1,551	1,551	M. Wfc. back shelf**
Castro	1	Amarillo	42-069-60003	6,909-7,059	150	64.0	26.0	2,500	2,505	M. Wfc. por. dol.
Castro	7	Union	42-069-60014	5,183-5,228	45	6.0	—	2,750	—	T. Wfc. sl. por. (sabk.)
Castro	7	Union	42-069-60014	5,838-5,932	94	***	***	2,206	2,206	M. Wfc. chalky ls.
Castro	10	Phillips	42-069-30002	6,762-6,782	20	0.36	0.27	2,560	2,483	U. Wfc. sl. por. dol. ls. (sabk.)
Childress	76	Westex	42-075-60068	2,633-2,663	30	0.95	0.03	1,818	1,781	U. Wfc. dol. and ls.**
Cottle	10	Murphy	42-101-10217	3,169-3,178	9	15.5	8.8	1,867	1,897	U. Wfc. sl. calc. dol. (sabk.)
Donley	31	Shell	42-129-60001	3,350-3,399	49	0.51	0.79	1,797	1,754	U. Wfc. por. ls. (sabk.)
Floyd	*	Amoco	42-153-30194	5,500-5,581	81	8.9	8.3	2,081	2,081	*
Floyd	*	Ken Pet.	42-153-30008	4,660-4,750	90	0.68	0.59	3,597††	2,392††	*
Hale	6	Mobil	42-189-10202	7,864-8,036	172	1.04	0.1	2,583	2,461	L. Wfc. sl. por. ls. (?) may be U. Penn.
Hall	*	Americas	42-191-30001	3,365-3,390	25	0.62	0.44	1,890	1,830	*
Hartley	13	Standard	42-205-35008	3,520-3,623	66	0.77	—	1,381	—	T. Wfc. an. dol. (sabk.)
Hartley	13	Standard	42-205-35008	3,824-3,890	66	1.0	—	1,796	—	U. Wfc. dol. ls. (sabk.)
Hartley	13	Standard	42-205-35008	4,896-4,940	44	0.24	—	1,574	—	L. Wfc. calc. ss.
Hartley	16	Standard	42-205-00023	3,916-3,957	41	1.75	—	3,007	—	U. Wfc. dol. ls. (sabk.)
***Lamb	*	Gulf	42-279-30045	7,352-7,404	52		***	2,522	2,510	*
***Motley	13	Mobil	42-345-00015	4,674-4,715	41		***	1,950	1,947	U. Wfc. dol. (sabk.)
Oldham	4	Shell	42-359-00026	3,446-3,471	25	27.0	44.0	1,945	1,908	U. Wfc. **
Oldham	48	Shell	42-359-30001	5,340-5,367	27	1.0	0.6	1,824	1,741	M. Wfc. ls.
***Potter	26	Rice	42-375-35013	3,907-4,050	143		***	1,486	—	T. Wfc. por. dol.
Swisher	8	Burdell	42-437-60012	5,765-5,796	31	0.1	—	2,360	—	U. Wfc. por. ls.

† The head values appear to be anomalously high compared with surrounding values; however, the test appears acceptable mechanically.

†† A 1,000-psi difference between ISIP and FSIP is not explainable at this time; the higher value is selected.

††† L. = lower, M. = mid, U. = upper, ls. = limestone, dol. = dolomite, por. = porous, sl. = slightly, T. = top, Wfc. = Wolfcamp, calc. = calcareous, sabk. = sabkha may have influenced dolomitization, Penn. = Pennsylvanian, an. = anhydritic.

* no log information **no sample log ***build-up test reached formation pressure; permeability cannot be computed; consequently an illustration of the data is not provided on the following pages.

— only one shut-in period.

Type of Data : Formation Field Tests / DST's

Data Collection Location

Areal location : Palo Duro Basin ; most data for basin margins

Subsurface location : Deep brine aquifer below evaporites in the granite wash and Wolfcamp carbonates

Method of collection / analyses : DST's conducted in petroleum wildcat wells and from bottom hole pressures measured in oil fields

Amount of data : 19 calculated permeability values for Wolfcamp carbonates

Data sources : Petroleum industry

Data documented : TBEG / Bassett and Bentley Rpt of Inv. No. 130 / TBEG Geological Cir. 81-3

Data storage location : TBEG, Austin Texas

Data related uncertainties : Interest test by oil companies are based on hydrocarbon shows rather than on other physical criteria such as high porosity indicated by electric logs. The most permeable parts of the deep Fms. may be untested.

Type of Data : Groundwater Quality

Data Collection Location

Areal location : Pala Duro Basin, most data in marginal areas

Subsurface location : All samples are from the deep brine aquifer below evaporites in Wolfcamp carbonates and granite wash

Method of collection / analyses : water samples obtained during drill-stem tests by petroleum industry during wildcat drilling program.

Amount of data : Several thousand chemical analyses available. TBEG used analyses from 101 samples for interpretation. Constituents presented : TDS, Temp, pH, Ca, Na, Mg, HCO_3, Cl, SO_4

Data sources : Petroleum industry — presented in TBEG Rpt. Inv. No. 130 Bassett and Bentley, 1982.

Data documented : obtained from either Petroleum Data System Brine file at the Univ of Okla or from petroleum companies.

Data storage location : TBEG, Austin, Texas

Data related uncertainties : see ~~Attached~~ page 14 ~~paper~~ from Bassett and Bentley 1982.

MISSISSIPPI SALT DOME BASIN

Type of Data: Hydrostratigraphic Data from geophysical logs

Data Collection Location

Areal location: Mississippi SALT Basin

Subsurface location: deepest well at each of the 11 sites 1,275 to 6,041 ft in depth / oil wells to depths greater than 10,000 ft.

Method of collection/analyses: geophysical logs

Amount of data: Law Engineering logged the deep wells drilled for DOE which ranged from 1,275 to 6041 ft in depth — oil well records from 100's of wells

Data sources: Law Engineering, oil companies

Data documented: ONWI-120, Vol VII Appendix

Data storage location: ERTEC /

Data related uncertainties:

Type of Data : Potentiometric Data

Data Collection Location

Areal location : Mississippi SALT Basin

Subsurface location : Tertiary and Quaternary sedimentary deposits

Method of collection / analysis : steel tape or water level recorder

Amount of data : Data was collected for the wells drilled by Law Engineering (73) - periodic measurements (2 monthly) taken since sept. 79.

Data sources : LAW Engineering / ERTEC

Data documented : ONWI 120 Appdx. / ONWI-478

Data storage location : ERTEC

Data related uncertainties : See ONWI-478

Type of Data : Formation Field Tests (Pumping tests)

Data Collection Location

Areal location : Mississippi salt Basin / see map

Subsurface location : See attached tables - mostly Tertiary sedimentary deposits

Method of collection / analysis : Single well drawdown/recovery tests w/ Jacob straight line analysis

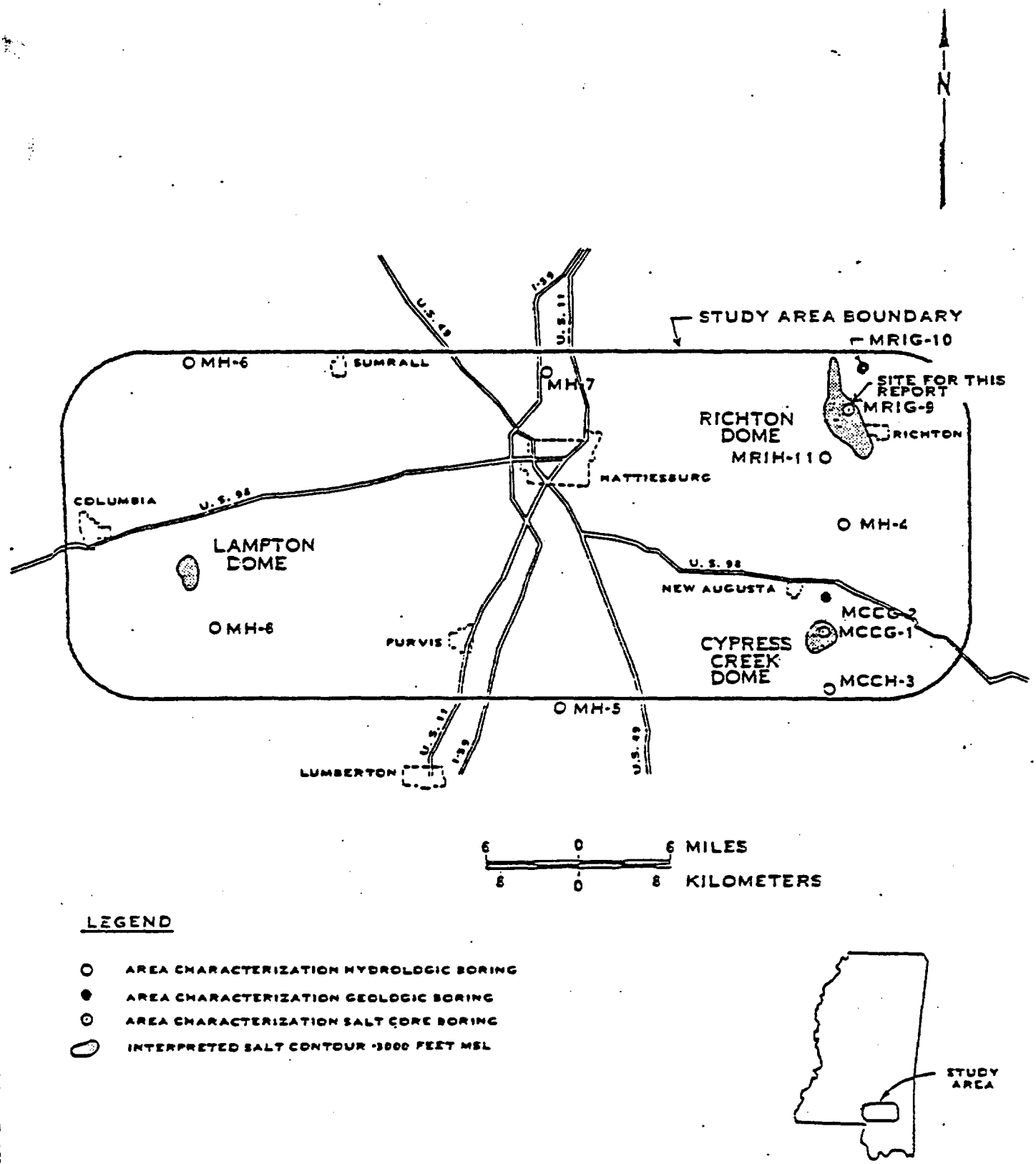
Amount of data : 41 wells / 11 data collection sites

Data sources : Law Engineering

Data documented : Well completion Rpts for 11 data collection sites - ONWI 170 thru 180

Data storage location : ERTEC

Data related uncertainties : Single well pumping tests and analysis



WELL COMPLETION REPORT T-1175A-0WC7	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA	MISSISSIPPI STUDY AREA MAP JOB NO. MV9700 FIGURE 1.0-1.

Type of Data : Groundwater Quality

Data Collection Location

Areal location : Mississippi Salt basin

Subsurface location : Regional groundwater, miocene and younger deposits

Method of collection / analyses : Std methods

Amount of data : over 150 wells sample for std analytical set of basic parameters -

Data sources : USGS files / LETCO

Data documented : ONWI-120 appx / USGS data files

Data storage location : USGS / ERTEC

Data related uncertainties :

LOUISIANA SALT DOME BASIN

Type of Data : Hydrostratigraphy data from geophysical logs

Data Collection Location

Areal location : Louisiana Salt Basin

11 deep wells (see potentiometric data for map), and 100's of oil exploration wells

Subsurface location : near surface to > 10,000 feet below MSL.

Method of collection/analysis : Geophysical logs

Amount of data : 100's of wells

Data sources : Oil Companies, Louisiana Dept. of Conservation

Data documented : ONWI-119 Appendix VI/V.

Data storage location : ERTEC/Letco

Data related uncertainties :

Type of Data: Potentiometric Data

Data Collection Location

Areal location: Louisiana Salt Basin

Subsurface location: mostly Tertiary sedimentary deposits

Method of collection/analyses: Water level recorder; steel tape

Amount of data: 16 wells drilled by Letco, ≈ monthly readings (See field test data for map of well locations)

Data sources: Letco/Ertec

Data documented: ONWI 119/ONWI 478

Data storage location: ERTEC

Data related uncertainties:

Type of Data: Formation Field test / Aquifer pumping tests

Data Collection Location

Areal location: Louisiana Salt Basin

See attached map

Subsurface location: Various Tertiary Sed. depos.

Method of collection / analyses: Single well drawdown / recovery tests

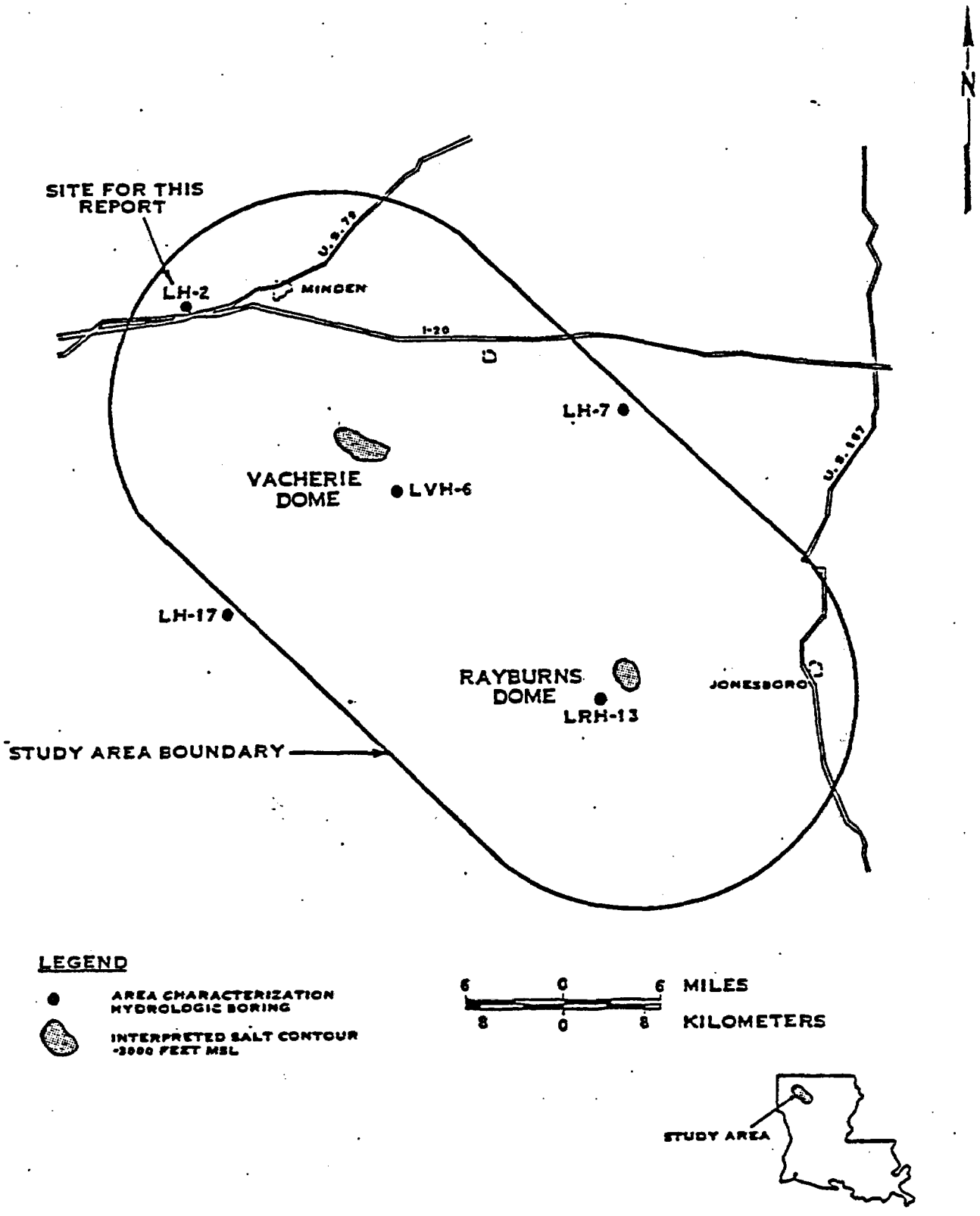
Amount of data: tests on 16 wells drilled by Letco

Data sources: Letco / ERTEC

Data documented: ONWI-119 Appendix / well completion reports ONWI-181-185

Data storage location: ERTEC

Data related uncertainties: straight line semi log plots.



WELL COMPLETION REPORT WC-10012A-0	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA	NORTH LOUISANA STUDY AREA MAP JOB NO. MV9700 FIGURE 1.0-1

Type of Data : Groundwater Quality Data

Data Collection Location

Areal location : Louisiana Salt Basin

Subsurface location : Miocene and younger deposits

Method of collection/analyses : Std. methods / std. parameter set

Amount of data : ≈ 350 water wells

Data sources : USGS/Letco

Data documented : ONWI-119 Appendix

Data storage location : ERTEC

Data related uncertainties :

Enclosure 3

DATA RELATED QUESTIONS

Hydrology Section, NRC
Prepared for May, 1984 Data Orientation Visit

Following is a list of questions relating to the site characterization hydrogeologic data sets. We are submitting these questions for your consideration in preparing your presentations to us for the May, 1984 Data Orientation Visit. We would understand if you considered it appropriate to defer some of these questions for later interactions.

Palo Duro Basin

NRC staff has noted the sparsity of hydrogeologic data so far presented for the central and western (e.g. New Mexico) portions of the Palo Duro Basin. We suspect that several as yet unpublished reports (see attached list) would contain such information. Specific data questions in this area are:

1. Are any new potentiometric maps being prepared? When will they be published? Where will they be published? Will the maps include any data from New Mexico? What portion of the new potentiometric data comes from DST evaluations?

2. Has there been any recent testing in Deaf Smith or Swisher other than that described in the Stone and Webster Completion reports for wells which fall in those counties?

3. Are there geophysical/stratigraphic logs for the SWEC wells in Deaf Smith and Swisher Counties? Will they be included in the SWEC Well Completion Reports?

A data-related question for which we hope to find answers in the Intera regional modeling reports is:

1. If the input data for modeling includes unpublished data, where will synthesis of this data be documented? For example, were will potentiometric maps developed by Intera for modeling be documented?

Other general questions:

1. Are there any existing or intended direct field measurements of vertical conductivity?

2. Has DOE or subcontractor staff addressed resolution between Bassett/Bentley and Handford interpretations of potentiometric data?

3. Does the Texas Bureau have documentation of the testing methods, shut-in times, etc. of the DST and potentiometric data they've collected themselves and acquired from oil companies?

4. Will water quality data be used to characterize brine density gradients?

Paradox

NRC staff andcontractors have noted some of the problems of hydraulic testing in low permeability salt deposits such as the tests run on the evaporite sequence in GD-1. We will be reviewing DOE analyses and alternative testing approaches (e.g. ONWI-491) which are directed towards addressing the problems of testing in salt.

Specific questions regarding GD-1 data include:

1. Has the long-term testing procedure referred to in ONWI-388 Vol 1 p. 76 been completed? Reported upon in a separate topical report?

2. Were any gas quality tests run at GD-1?

3. Are there contractor data files in existence for data which is presented in ONWI-388?

   3a. ONWI-388 refers to "WCC project files." What do they contain?

   3b. Would data files or WCC project files contain any further discussion of the isotopic water quality data presented in ONWI-388?

Other general questions on the Paradox Basin are:

1. Was the potentiometric information acquired by WCC from oil companies checked against any technical criteria or QA/QC requirements? Is there a record of such a filtering process?

2. Has any further testing been done in Davis or Lavender Canyons since ONWI-290 was written?

3. Has there been seismic exploration of faults within the Gibson Done since ONWI-290 was written?

Domes

1. How much data has been obtained from outside sources since Ertec has been involved with Gulf Interior Salt Dome characterization?

   o We have recently received Ertec modeling reports which demonstrate that Ertec has developed a significantly broader hydrogeologic data base than was previously developed. Where will synthesis of this additional data be documented? For example, where will potentiometric maps developed by Ertec for modeling be documented?

2. What testing has been done at or near domes since LETCO's tests?