FORM 1012 R-6

LITTLE'S 112485 6M 9/80

CHEMICAL RESEARCH AND DEVELOPMENT DEPARTMENT

HALLIBURTON SERVICES
DUNCAN, OKLAHOMA

LABORATORY REPORT

No. F11-T193-81

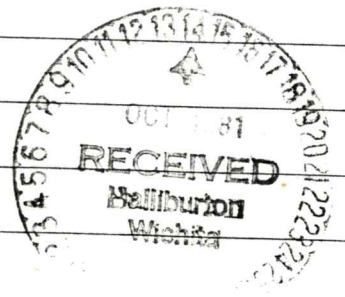
To Mr. M. L. Klein

Halliburton Services

Wichita, Kansas

Date October 6, 1981

We give below results of our examination of submitted core samples.



Submitted by Eagle Exploration, Inc.

Marked Well: Packard No. 3
Location: Barber County, Kansas
Formation: Mississippian
Depth: 4,245-4,254 feet

Purpose

These formation cores were submitted for the following tests and examinations: x-ray diffraction, acid solubility, scanning electron microscope (SEM), petrographic, fracture flow capacity, and immersion.

Conclusions

Results of the requested tests and examinations are presented in the Data section of this report.

Based on these results, an aqueous base treating fluid could be used to stimulate this well. Clay mineral stabilization should be considered. The use of potassium chloride and CLA-STA II clay stabilizer will help minimize clay hydration. Clay hydration could lead to particle swelling and/or migration.

Data

Immersion Tests

Effects of immersion under vacuum at 110°F (est. BHT) for one hour in the following:

Sample No.	Depth (feet)	Fresh Water	2% KCl	2% KCl*	2% KCl**	7 1/2% MCA	6% HF	Kero-sene
12	4,246-47	SAF	VSAF	VSAF	VSAF	MAF	SAF	NFR
14	4,248-49	SAF	SAF	SAF	SAF	MAF	SAF	NFR
16	4,250-51	SAF	VSAF	MAF	MAF	MAF	SAF	NFR
18	4,252-53	MAF	MAF	SAF	SAF	MAF	SAF	NFR

NFR = No fines released.
VSAF = Very small amount fines.
SAF = Small amount fines.
MAF = Moderate amount fines.
LAF = Large amount fines.

PD = Partially disintegrated.
CD = Completely disintegrated.
GR = Gelatinous residue formed.
P Dis = Partially dissolved.
C = Completely dissolved.

* 0.5 gallon CLA-STA II compound per 1,000 gallons.
** Adjusted pH with 10 lb K-34 per 1,000 gallons.

Qualitative X-ray Diffraction and Acid Solubility Analyses

Sample No. / Depth (ft)	12 4,246-7	14 4,248-9	16 4,250-1	18 4,252-3
Acid Solubility, %*	0.7	0.1	0.9	0.4
Quartz	MJ	MJ	MJ	MJ
Feldspar	-	-	-	-
Calcite	-	-	-	-
Dolomite	-	-	-	-
Kaolinite	SM	SM	SM-MD	SM-MD
Illite	-	TR	TR	VS
Smectite	-	-	-	-
Mixed Layer Clay	VS	VS	VS	SM
Chlorite	-	-	-	SM
Sodium Chloride	VS	VS	TR	VS
Talc ($Mg_3Si_4 + O_{10}(OH)_2$)	SM	-	-	-

Coding	Reported Amount	Approximate Percentage Range
-	None Reported	<0.1
TR	Trace	0.1 to 1.0
VS	Very Small	1.0 to 3.0
SM	Small	3.0 to 10.0
MD	Moderate	10.0 to 20.0
LG	Large	15.0 to 40.0
MJ	Major	40.0 to 100.0

* This is solubility in dilute hydrochloric acid as calcium carbonate only.

Data (Cont'd)

Fracture Flow Capacity Tests

Core Depth: 4,245-46 feet

Proppant Concentration (lb/ft^2)	Closure Pressure (psi)	Fracture Flow Capacity (md-ft)
Proppant: 20/40 Ottawa sand		
0.5	2000	1,399
	3000	919
	4000	577
1.0	2000	1,511
	3000	1,374
	4000	1,117
2.0	2000	2,125
	3000	2,094
	4000	1,763
Proppant: 10/20 Ottawa sand		
0.5	2000	3,024
	3000	2,083
	4000	1,214
1.0	2000	3,648
	3000	3,110
	4000	2,808
2.0	2000	7,812
	3000	6,850
	4000	5,199

Petrographic Examination

Sample No.	Depth (feet)	Description
12	4,245	SANDSTONE - Framework composed of subangular to subrounded, fine to medium quartz grains and rock fragments. Pore spaces lined with traces of mixed layer clays; kaolinite may act as pore fill. Trace of visible porosity.
14	4,248	MICROCRYSTALLINE CHERT - Sample composed of microcrystalline chert. Much introcrystalline porosity due to loose consolidation.
18	4,252	SHALE AND CHERT CONGLOMERATE - Framework consists of granule sized shale and chert pebbles in a matrix of microcrystalline chert and hydrocarbon stained clay. Visible porosity is poor.

Data

Scanning Electron Microscope Examination

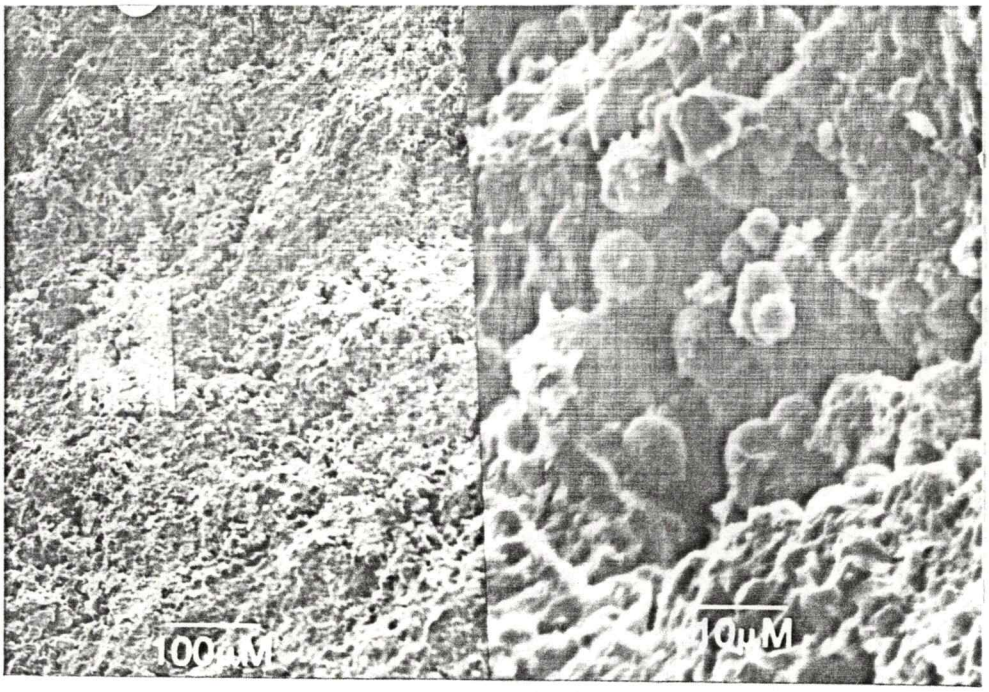


Fig. 1; Neg. No. 21805-4996; Sample No. 12; Depth: 4,246-7 ft; 100X and 1000X. This sample is composed primarily of microcrystalline quartz grains (shown in the micrographs). Porosity appears fair, due to the loose consolidation of the basic framework grains.

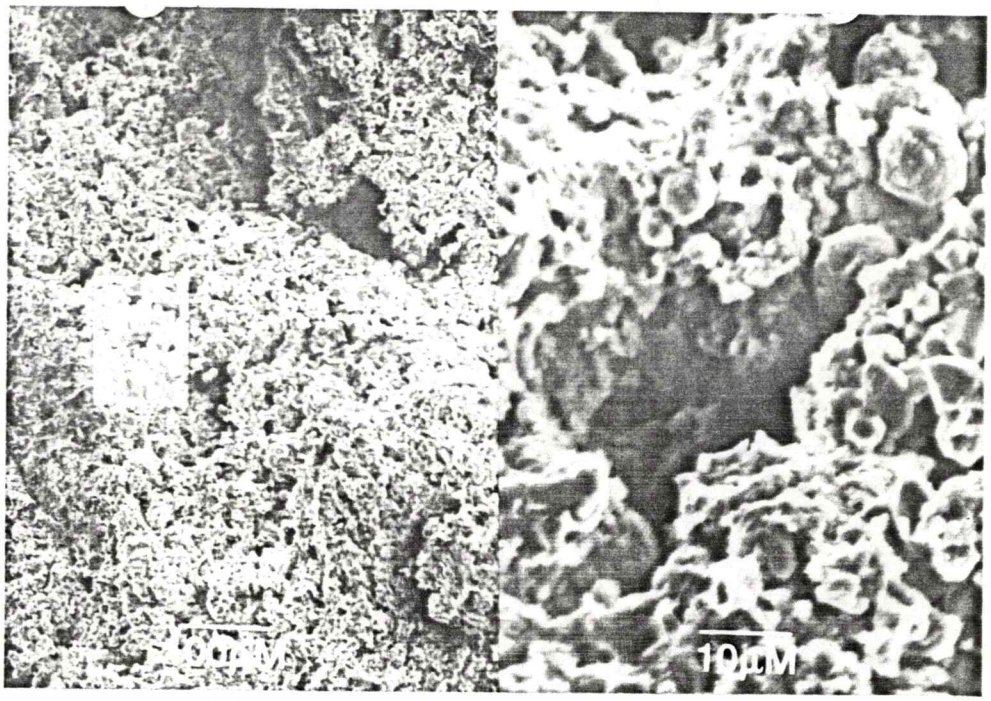


Fig. 2; Neg. No. 21805-4997; Sample No. 14; Depth: 4,248-9 ft; 100X and 1000X. This sample is similar to Sample No. 12.

Data (Cont'd)

SEM (Cont'd)

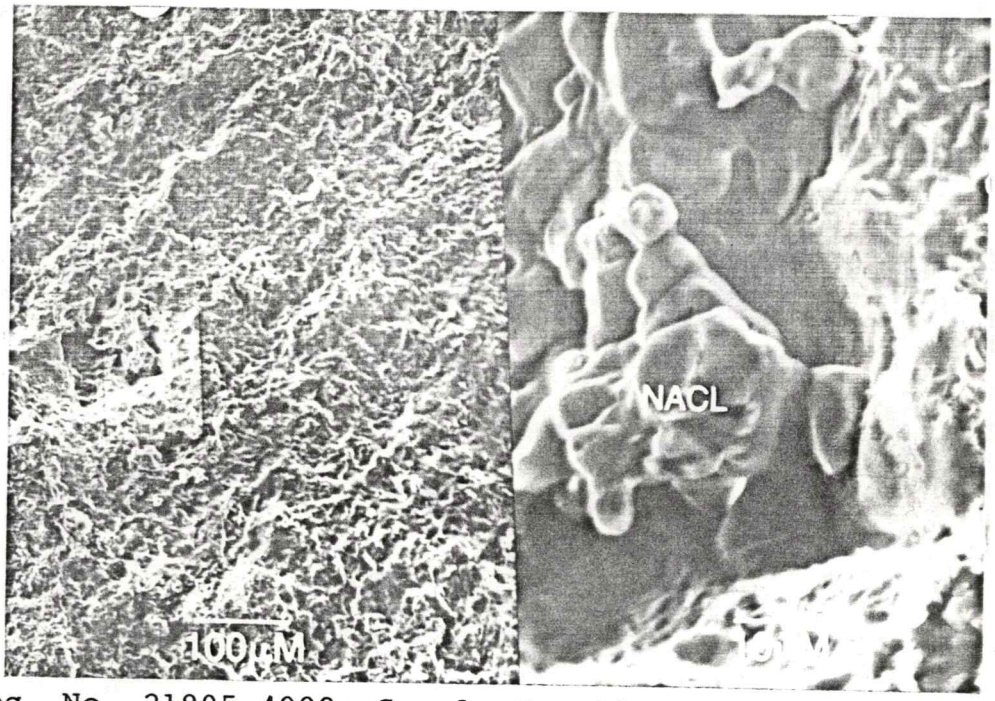


Fig. 3; Neg. No. 21805-4998; Sample No. 18; Depth: 4,252-3 ft; 100X and 1000X. This sample is similar to the previous two, with a tighter basic framework. The photomicrographs show a typical pore space filled with small grains of sodium chloride and surrounded by quartz.

Remarks

The data in this report were given to Mr. M. L. Klein on September 23, 1981.

A representative sample of the remaining cores from this project was stored in the Core Library.

Data Book Reference

The data presented in this report are recorded in Fracturing Book No. 4495, page 9; Fracturing Book No. 4459, pages 59-61; Analytical Book No. 4483, page 48; Analytical Book No. 4496, page 18; and Analytical Book No. 4499, pages 17 and 18.

cc: Mr. H. O. Watson
Mr. K. W. McKown
Mr. A. B. Waters
Mr. R. M. Lasater
Mr. A. R. Jennings, Jr.

Respectfully submitted,

Laboratory Analyst

Terracina-Phelps-Rice-Ketchum-

Blanton-Blundell-Ewens-Lovett-db

HALLIBURTON SERVICES

By John M. Terracina

John M. Terracina

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
OKLAHOMA CITY, OKLAHOMA

August 18, 1981

REPLY TO
SUITE 133
400 SOUTH VERMONT
OKLAHOMA CITY, OK
73108

Eagle Exploration, Inc.
107 North Market - Suite 300
Wichita, Kansas 67202

Attn: Mr. Bernie Broda

Subject: Core Analysis Data
Packard No. 3 Well
Barber County, Kansas
CLI File 3402-10848

Gentlemen:

Cores taken from the subject well in the Mississippian Formation were received at the Oklahoma City laboratory for special analytical testing described on the procedure page.

The accompanying Coregraph presents the Surface Core Gamma Log and binomially averaged core analysis data in graphical form to aid correlation with downhole electrical surveys.

Tabular presentation of the measured physical properties may be found on pages one and two of this report.

It is a pleasure to have this opportunity of serving you.

Very truly yours,

CORE LABORATOTIES, INC.

J. Michael Edwards

J. Michael Edwards
District Manager

JME:gs

10 cc - Addressee

Eagle Exploration, Inc.
Packard No. 3 Well
CLI File 3402-10848

Procedure Page

Handling and Analytical Procedures

Diamond coring equipment and water base mud were used to obtain 4.0 inch diameter cores from selected intervals between 4230 and 4255 feet.

Cores were preserved at well site in saran and bags by client representative.

The cores were transported to Oklahoma City by Christensen personnel.

A Core-Gamma Log was recorded for downhole E-Log correlation.

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Core analysis was made in the intervals requested on right cylinder full diameter samples.

Fluid removal was accomplished using vacuum retorts.

Porosity was determined by density balance method.

Air permeability in two horizontal directions--measured without Klinkenberg correction.

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The results of analysis performed on sidewall core samples which were submitted from the subject well are on page two.

Porosities and fluid saturations were determined by summation of fluids method using a controlled temperature retort.

Air permeabilities were determined empirically.

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Temporary storage of cores in Oklahoma City laboratory awaiting additional instructions.

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

EAGLE EXPLORATION, INC.
PACKARD NO. 3 WELL
NURSE FIELD
BARBER COUNTY, KANSAS

DATE: 8/18/81
FORMATION: MISSISSIPPIAN
DRLG. FLUID: WATER BASE MUD
LOCATION: SEC. 14-31S-13W

FILE NO: 3402-10848
ENGINEER: EDWARDS
ELEVATION:

WHOLE CORE ANALYSIS

SMP. NO.	DEPTH	PERM. TO AIR MD. MAXIMUM	PERM. TO AIR MD. 90 DEG	POROSITY PERCENT	FLUID SATS. OIL	FLUID SATS. WTR.	GR. DEN.	DESCRIPTION
	4230.0-34.0							SH
+ 1	4234.0-35.0	0.2	0.1	1.3	0.0	76.1	2.71	LM,SHY
+ 2	4235.0-36.0	2.3	0.1	2.7	0.0	81.0	2.72	LM,SHY
+ 3	4236.0-37.0	0.6	0.1	0.6	0.0	77.0	2.72	LM,PP VGS,SHY
4	4237.0-38.0	0.1	0.1	2.0	0.0	72.6	2.73	LM,PP VGS,SHY
	4238.0-39.0							SH
+ 5	4239.0-40.0	12.0	0.5	10.5	0.0	93.2	2.75	LM,SHY
+ 6	4240.0-41.0	39.0	0.4	8.0	0.0	90.5	2.70	LM,SHY
7	4241.0-42.0	0.5	0.3	13.7	12.8	60.2	2.64	CHAT
8	4242.0-43.0	1.5	0.8	17.6	16.4	57.9	2.61	CHAT
9	4243.0-44.0	0.7	0.6	20.5	16.7	59.4	2.67	CHAT
10	4244.0-45.0	1.0	1.0	17.5	17.5	59.0	2.64	CHAT
11	4245.0-46.0	1.1	0.7	18.1	16.9	57.9	2.65	CHAT
12	4246.0-47.0	242.0	1.5	17.4	17.0	55.6	2.62	CHAT,VF
13	4247.0-48.0	2.0	1.5	15.7	18.8	57.7	2.64	CHAT
14	4248.0-49.0	36.0	6.8	24.3	15.3	54.9	2.61	CHAT
15	4249.0-50.0	2.9	2.9	15.5	14.2	56.3	2.64	SD
16	4250.0-51.0	3.5	3.1	16.1	14.6	59.0	2.62	CHAT
17	4251.0-52.0	3.1	2.7	22.1	13.2	61.2	2.60	CHAT
18	4252.0-53.0	59.0	1.7	19.4	14.2	62.1	2.64	CHAT,VF
19	4253.0-54.0	3.0	2.7	20.8	14.0	63.7	2.61	CHAT
	4254.0-4255.0	TOO BROKEN FOR ANALYSIS						

\+ DENOTES HORIZONTAL CRACKS

CORE ANALYSIS RESULTS

Company EAGLE EXPLORATION, INC. Formation MISSISSIPPIAN File 3402-10848
Well PACKARD NO. 3 Core Type SIDEWALL Date Report 8/18/81
Field NURSE Drilling Fluid WATER BASE MUD Analysts EDWARDS
County BARBER State KANSAS Elev. Location SEC. 14-31S-13W

Lithological Abbreviations

SAND-SD, SHALE-SH, LIME-LM, DOLOMITE-DOL, CHERT-CH, GYPSUM-GYP, ANHYDRITE-ANHY, CONGLOMERATE-CONG, FOSSILIFEROUS-FOSS, SANDY-SDY, SHALY-SHY, LIMY-LMY, FINE-FN, MEDIUM-MED, COARSE-CSE, CRYSTALLINE-XLN, GRAIN-GRN, GRANULAR-GRNL, BROWN-BRN, GRAY-GY, VUGGY-VGY, FRACTURED-FRAC, LAMINATION-LAM, STYLOLITIC-STY, SLIGHTLY-SL/, VERY-V/, WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
	SIDEWALL ANALYSIS					
1	2526	0.1	13.2	0.0	61.4	Lm,slty,foss,no odor,no flu
2	2528	<0.1	10.5	0.0	55.2	Lm,slty,foss,no odor,no flu
3	3980	<0.1	11.6	0.0	66.7	Lm,slty,no odor,no flu
4	3981	0.2	13.8	16.7	43.5	Lm,slty,fair odor,fair flu
5	4050	<0.1	11.0	0.0	55.5	Lm,slty,no odor,no flu
6	4210	0.2	13.4	13.4	30.9	Lm,slty,fair odor,fair flu

CORE LABORATORIES, INC. *Petroleum Reservoir Engineering*

COMPANY EAGLE EXPLORATION, INC. FILE NO. 3402-10848

WELL PACKARD NO. 3 DATE 8/18/81

FIELD NURSE FORMATION MISSISSIPPIAN ELEV.

COUNTY BARBER STATE KANSAS DRLG. FLD. WATER BASE MUD CORES

LOCATION SEC. 14-31S-13W

CORRELATION COREGRAPH

VERTICAL SCALE: 5" = 100'