Permit #: 20043 Date Issued: 5-4-89

County: Atchison Date Cancelled:

CONFIDENTIAL UNTIL: Date Plugged:

OGC FORMS	Date Received
1	
2	
3	5-4-89
3i	8-9-2000
4	1-18-1994, 5-4-1989
4i	
5	8-8-89
6	
7	
8	
11	10-27-2000
12	
Misc. Form 2	

COMMENTS:

	TYPE	ID #	Date Received
Logs			
Samples	chip		
	core		
Analyses	water		
	core		

Additional Submitted Data:
MIT 3-14-2001

RECEIVED
NOV 15 2007
Oil & Gas Council

STATE OF MISSOURI
MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM

FORM OGC-3

APPLICATION FOR PERMIT TO DRILL, DEEPEN OR PLUG BACK

☐ APPLICATION TO DRILL ☐ DEEPEN ☐ PLUG BACK ☒ FOR AN OIL WELL ☐ OR GAS WELL

NAME OF COMPANY OR OPERATOR			DATE
INVESTMENT EQUIPMENT LLC			11-14-2007
ADDRESS	CITY	STATE	ZIP CODE
17509 COUNTY ROAD 14	FORT MORGAN	CO	80701

DESCRIPTION OF WELL AND LEASE

NAME OF LEASE	WELL NUMBER	ELEVATION (GROUND
GLOVER FARMS	# 1	1036.4

WELL LOCATION (GIVE FOOTAGE FROM SECTION LINES)

990 ft. from ☐ North ☒ South section line 2310 ft. from ☒ East ☐ West section line

WELL LOCATION	LATITUDE	LONGITUDE	COUNTY
Sec. 32 Township 65 North Range 39 ☐ East ☒ West	40.39640	-95.31934	ATCHISON

NEAREST DISTANCE FROM PROPOSED LOCATION TO PROPERTY OR LEASE LINE _____ FEET

DISTANCE FROM PROPOSED LOCATION TO NEAREST DRILLING, COMPLETED OR APPLIED – FOR WELL ON THE SAME LEASE _____ FEET

PROPOSED DEPTH	DRILLING CONTRACTOR, NAME AND ADDRESS	ROTARY OR CABLE TOOLS	APPROX. DATE WORK WILL START
1407	NA	NA	

NUMBER OF ACRES IN LEASE

NUMBER OF WELLS ON LEASE INCLUDING THIS WELL, COMPLETED IN OR DRILLING TO THIS RESERVOIR _____

NUMBER OF ABANDONED WELLS ON LEASE _____

IF LEASE PURCHASED WITH ONE OR MORE WELLS DRILLED, FROM WHOM PURCHASED?

NAME _____

ADDRESS _____

NO. OF WELLS PRODUCING _____ INJECTION _____ INACTIVE _____ ABANDONED _____

STATUS OF BOND			
	☒ SINGLE WELL AMOUNT $ 5000	☐ BLANKET BOND AMOUNT $ _____	☐ ON FILE ☐ ATTACHED

REMARKS: (IF THIS IS AN APPLICATION TO DEEPEN OR PLUG BACK, BRIEFLY DESCRIBE WORK TO BE DONE, GIVING PRESENT PRODUCING/INJECTION ZONE AND EXPECTED NEW INJECTION ZONE; USE BACK OF FORM IF NEEDED)

CHANGE GLOVER FARMS # 1 FROM PERMITTED FOR INJECTION TO A PRODUCING WELL, PREVIOUS OWNER, STONE PET, PERMITTED FOR INJECTION BUT NEVER CONVERTED OR INJECTED ANY WATER.

PROPOSED CASING PROGRAM				APPROVED CASING – TO BE FILLED IN BY STATE GEOLOGIST			
AMOUNT	SIZE	WT/FT	CEMENT	AMOUNT	SIZE	WT/FT	CEMENT
353	8 5/8	24	250				89
1514	5 1/2	17	155				

I, the Undersigned, state that I am the MANAGING MEMBER of the INVESTMENT EQUIPMENT LLC (Company), and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct, and complete to the best of my knowledge.

SIGNATURE Dave Rebol DAVE REBOL DATE 11-14-07

PERMIT NUMBER 20043 ~~2005~~+

APPROVED DATE JH Williams 5-4-89 10-29-07

APPROVED BY Jim R Kirkland

☒ DRILLER'S LOG REQUIRED
☒ CORE ANALYSIS REQUIRED IF RUN
☐ SAMPLES REQUIRED
☒ SAMPLES NOT REQUIRED
☐ WATER SAMPLES REQUIRED AT

☒ E-LOGS REQUIRED IF RUN
☒ DRILL SYSTEM TEST INFO REQUIRED IF RUN

NOTE ▶ THIS PERMIT NOT TRANSFERABLE TO ANY OTHER PERSON OR TO ANY OTHER LOCATION.

APPROVAL OF THIS PERMIT BY THE OIL AND GAS COUNCIL DOES NOT CONSTITUTE ENDORSEMENT OF THE GEOLOGIC MERITS OF THE PROPOSED WELL NOR ENDORSEMENT OF THE QUALIFICATIONS OF THE PERMITTEE

I, _____ of the _____ (Company), confirm that an approved drilling permit has been obtained by the owner of this well. Council approval of this permit will be shown on this form by presence of a permit number and signature of authorized council representative.

DRILLER'S SIGNATURE DATE

Missouri Oil and Gas Council

Form OGC-3

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

APPLICATION TO DRILL ☒ DEEPEN ☐ PLUG BACK ☐

for an oil well ☐ or gas well ☐

NAME OF COMPANY OR OPERATOR The Stone Petroleum Corporation DATE 11/28/88

P.O. Box 52807 (Address) Lafayette (City) LA (State) 70505

DESCRIPTION OF WELL AND LEASE

Name of lease	Well number	Elevation (ground)
Glover Farms	No. 1	1036.4

WELL LOCATION 990' ft. from (N)(S) sec. line 2310 ft. from (E)(W) sec. line (give footage from section lines)

WELL LOCATION Section 32' Township 65N Range 39W County Atchison

Nearest distance from proposed location to property or lease line: 500 feet

Distance from proposed location to nearest drilling, completed or applied for well on the same lease: NA feet

Proposed depth	Drilling contractor, name & address	Rotary or Cable Tools	Approx. date work will start
2000'	EDCO, Eureka, KS	Rotary	4/30/89

Number of acres in lease: Drill Site-40

Number of wells on lease, including this well, completed in or drilling to this reservoir: 0

Number of abandoned wells on lease: 0

If lease, purchased with one or more wells drilled, from whom purchased: Name NA Address

No. of Wells: producing ____ injection ____ inactive ____ abandoned ____

Status of Bond: Single Well ☐ Amt. ____ Blanket Bond ☒ Amt. 40,000 ☒ ON FILE ☐ ATTACHED

Remarks: (If this is an application to deepen or plug back, briefly describe work to be done, giving present producing zone and expected new producing zone) use back of form if needed.

RECEIVED
MAY 04 1989
MO Oil & Gas Council
Economic Geology

Proposed casing program:

amt.	size	wt /ft.	cem.
300	8-5/8"	36#	Yes

Approved casing -- To be filled in by State Geologist

amt.	size	wt /ft.	cem.
✓	✓	✓	✓

I, the undersigned, state that I am the Drilling Engineer of the The Stone Petroleum Corp (company), and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature

Permit Number 20043

Approval Date 5-4-89

Approved By

Note: This Permit not transferable to any other person or to any other location.

☑ Drillers log required

☑ E-logs required if run

☑ Core analysis required if run

☑ Drill stem test info. required if run

☒ Samples required

☐ Samples not required

WATER SAMPLES REQUIRED @

Remit two copies to: Missouri Oil and Gas Council P.O. Box 250 Rolla, Mo. 65401

One will be returned for driller's signature

Approval of this permit by the Oil and Gas Council does not constitute endorsement of the geologic merits of the proposed well nor endorsement of the qualifications of the permittee.

3/12/82

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI OIL AND GAS COUNCIL

INJECTION WELL PERMIT APPLICATION
(TO DRILL, DEEPEN, PLUG BACK, OR CONVERT AN EXISTING WELL)

FORM OGC-31

RECEIVED
AUG 09 2000
MO Oil & Gas Council

NOTE ▶ Permit approval **for drilling only, not injection.** Approval or denial for injection determined after Mechanical Integrity Test results reviewed and official notification given.

☐ APPLICATION TO DRILL ☐ DEEPEN ☐ PLUG BACK ☒ CONVERSION

NAME OF COMPANY OR OPERATOR: Don Baker dba Camio Oil Company
DATE: 8/4/00

ADDRESS: P.O. Box 308
CITY: Augusta
STATE: KS
ZIP CODE: 67010

DESCRIPTION OF WELL AND LEASE

NAME OF LEASE: Glover Farm
WELL NUMBER: 1
ELEVATION (GROUND): 1036.4

WELL LOCATION: 990 FT. FROM (N) (S) SEC. LINE; 2310 FT. FROM (E) (W) SEC. LINE (GIVE FOOTAGE FROM SECTION LINES)

WELL LOCATION	SECTION	TOWNSHIP	RANGE	COUNTY
	32	65N	39W	Atchison

NEAREST DISTANCE FROM PROPOSED LOCATION TO PROPERTY OR LEASE LINE: 990 FEET
DISTANCE FROM PROPOSED LOCATION TO NEAREST DRILLING, COMPLETED OR APPLIED — FOR WELL ON THE SAME LEASE: _____ FEET

PROPOSED DEPTH	ROTARY OR CABLE TOOLS	DRILLING CONTRACTOR, NAME AND ADDRESS	APPROX. DATE WORK WILL START
1407 plugback			9/1/00

NUMBER OF ACRES IN LEASE: 260
NUMBER OF WELLS ON LEASE, INCLUDING THIS WELL, COMPLETED IN OR DRILLING TO THIS RESERVOIR: 2
NUMBER OF ABANDONED WELLS ON LEASE: _____

IF LEASE PURCHASED WITH ONE OR MORE WELLS DRILLED, FROM WHOM PURCHASED?
NAME _____
ADDRESS _____

NO. OF WELLS: PRODUCING 1
INJECTION 1
INACTIVE _____
ABANDONED _____

STATUS OF BOND: ☒ SINGLE WELL AMOUNT $ 3000 ☐ BLANKET BOND AMOUNT $ _____ ☒ ON FILE ☐ ATTACHED

REMARKS: (IF THIS IS AN APPLICATION TO DEEPEN OR PLUG BACK, BRIEFLY DESCRIBE WORK TO BE DONE, GIVING PRESENT PRODUCING/INJECTION ZONE AND EXPECTED NEW INJECTION ZONE; USE BACK OF FORM IF NEEDED.)

injection zone is 1398' - 1403'
lay line from existing water tank to existing well and MIT

PROPOSED CASING PROGRAM				APPROVED CASING — TO BE FILLED IN BY STATE GEOLOGIST			
AMOUNT	SIZE	WT/FT	AMT. OF CEM.	AMOUNT	SIZE	WT/FT	AMT. OF CEM.
1514'	5½"	15.5#	90 sx 50/50 poz w/ 65 sx Class A	"	"	"	"
				353'	8 5/8"	24#	250 sks.

I, the undersigned, state that I am the owner of the Camio Oil Compay (company), and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct, and complete to the best of my knowledge.

SIGNATURE: Don Baker
DATE: 8/4/00

PERMIT NUMBER: 20043
APPROVED DATE: 8-29-00
APPROVED BY: Jim R. Hamilton

☑ DRILLER'S LOG REQUIRED ☑ E-LOGS REQUIRED IF RUN
☑ CORE ANALYSIS REQUIRED IF RUN ☑ DRILL STEM TEST INFO. REQUIRED IF RUN
☐ SAMPLES REQUIRED
☒ SAMPLES NOT REQUIRED
☐ WATER SAMPLES REQUIRED AT _____

NOTE ▶ THIS PERMIT NOT TRANSFERABLE TO ANY OTHER PERSON OR TO ANY OTHER LOCATION. APPROVAL OF THIS PERMIT BY THE OIL AND GAS COUNCIL DOES NOT CONSTITUTE ENDORSEMENT OF THE GEOLOGIC MERITS OF THE PROPOSED WELL NOR ENDORSEMENT OF THE QUALIFICATIONS OF THE PERMITTEE.

REMIT TWO COPIES TO: MISSOURI OIL AND GAS COUNCIL, P.O. BOX 250, ROLLA, MO 65401

I _____ of the _____

Company confirm that an approved drilling permit has been obtained by the owner of this well. Council approval of this permit will be shown on this form by presence of a permit number and signature of authorized Council representative.

DRILLER'S SIGNATURE	DATE

PROPOSED OPERATIONS DATA

PROPOSED AVERAGE DAILY INJECTION,	PRESSURE vacuum PSIG, RATE _____ BPD/GPM, VOLUME 3-10 BBL/GAL
APPROVED AVERAGE DAILY INJECTION, (TO BE FILLED IN BY STATE GEOLOGIST).	PRESSURE Vacume PSIG, RATE _____ BPD/GPM, VOLUME 3-10 BBL/GAL
PROPOSED MAXIMUM DAILY INJECTION,	PRESSURE vacuum PSIG, RATE _____ BPD/GPM, VOLUME 3-10 BBL/GAL
APPROVED MAXIMUM DAILY INJECTION, (TO BE FILLED IN BY STATE GEOLOGIST).	PRESSURE Vacume PSIG, RATE _____ BPD/GPM, VOLUME 3-10 BBL/GAL

ESTIMATED FRACTURE PRESSURE/GRADIENT OF INJECTION ZONE PSI/FOOT

DESCRIBE THE SOURCE OF THE INJECTION FLUID #2 well - producer

NOTE ▶ SUBMIT AN APPROPRIATE ANALYSIS OF THE INJECTION FLUID. (SUBMIT ON SEPARATE SHEET)

DESCRIBE THE COMPATIBILITY OF THE PROPOSED INJECTED FLUID WITH THAT OF THE RECEIVING FORMATIONS, INCLUDING TOTAL DISSOLVED SOLIDS COMPARISONS.

water (fresh) same water from same formation

GIVE AN ACCURATE DESCRIPTION OF THE INJECTION ZONE INCLUDING LITHOLOGIC DESCRIPTIONS, GEOLOGIC NAME, THICKNESS, DEPTH, POROSITY, AND PERMEABILITY.

see attached

GIVE AN ACCURATE DESCRIPTION OF THE CONFINING ZONES INCLUDING LITHOLOGIC DESCRIPTION, GEOLOGIC NAME, THICKNESS, DEPTH, POROSITY, AND PERMEABILITY.

see attached

SUBMIT ALL AVAILABLE LOGGING AND TESTING DATA ON THE WELL

GIVE A DETAILED DESCRIPTION OF ANY WELL NEEDING CORRECTIVE ACTION WHICH PENETRATES THE INJECTION ZONE IN THE AREA OF REVIEW (½ MILE RADIUS AROUND WELL). INCLUDE THE REASON FOR AND PROPOSED CORRECTIVE ACTION.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI OIL AND GAS COUNCIL

WELL LOCATION PLAT

FORM OGC-4

2

OWNER: Glover Farm

LEASE NAME: Glover Farm owns the well

COUNTY: atchison

_____ FEET FROM _____ (N) - (S) SECTION LINE AND _____ FEET FROM _____ (E) - (W) SECTION LINE OF SEC. 32, TWP 65 N, RANGE 39

SCALE
1" =

900ft from South Line

2 910 ft from East Line

RECEIVED
JAN 18 1994
MO Oil & Gas Council

REMARKS

INSTRUCTIONS

On the above plat, show distance of the proposed well from the two nearest section lines, the nearest lease line, and from the nearest well on the same lease completed in or drilling to the same reservoir. Do not confuse survey lines with lease lines. See rule 10 CSR 50-2.030 for survey requirements. Lease lines must be marked.

This is to Certify that I have executed a survey to accurately locate oil and gas wells in accordance with 10 CSR 50-2.030 and that the results are correctly shown on the above plat.

(SEAL)

REMIT TWO (2) COPIES TO:
MISSOURI OIL AND GAS COUNCIL
P.O. BOX 250, ROLLA, MO 65401

REGISTERED LAND SURVEYOR

NUMBER

MO 780-0213 (10-87)

MISSOURI OIL AND GAS COUNCIL

WELL LOCATION PLAT

Form OGC - 4

Owner: CAMIO OIL COMPANY, Augusta, KS

RECEIVED

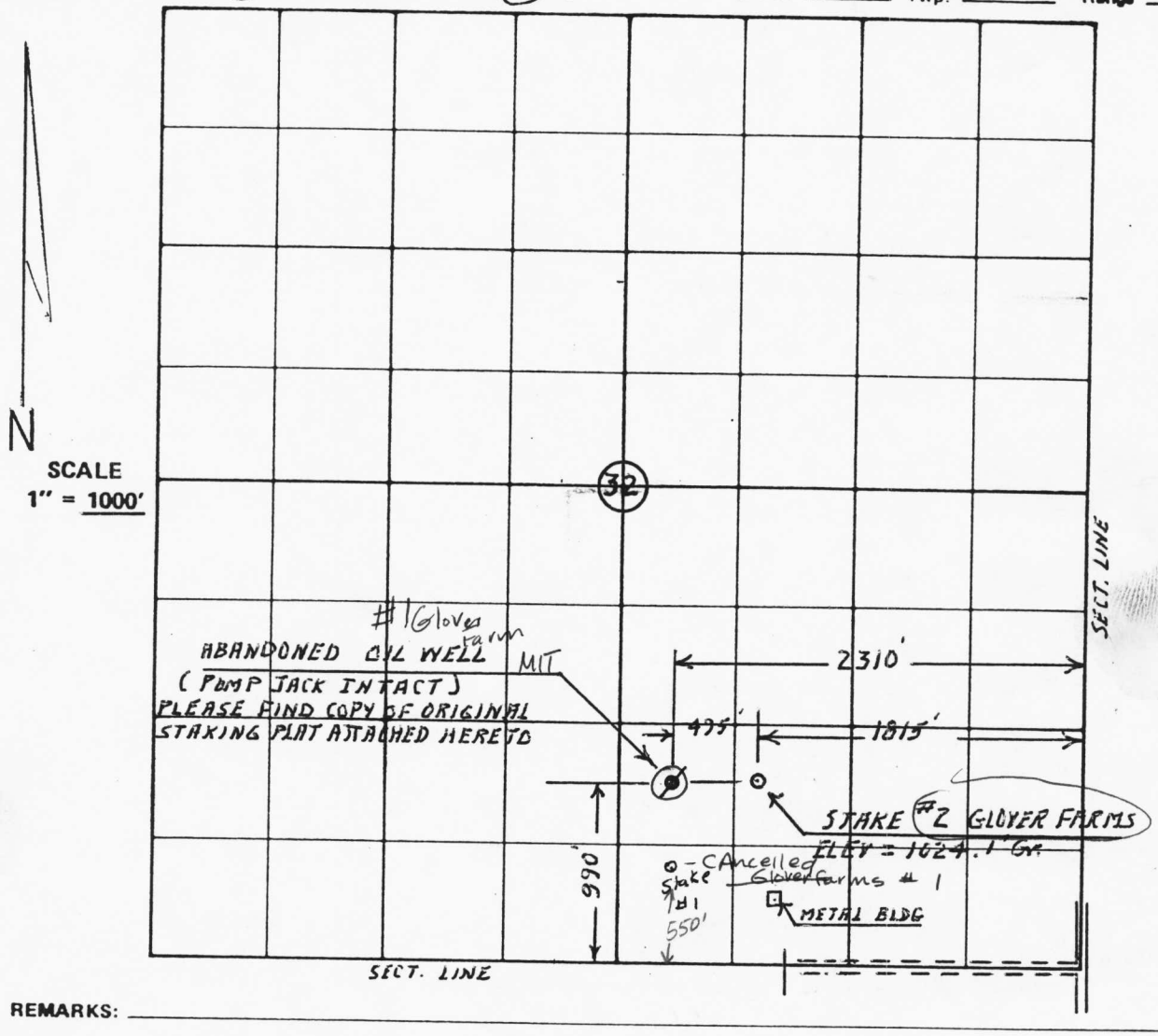
FEB 09 1998

MO Oil & Gas Council

Lease Name: Glover Farms #2

County: Bollinger (MO)

990 feet from (N) (S) line and 1815 feet from (E) (W) line of Sec. 32 Twp. 31N Range 39W



REMARKS:

Staking authorized by Mr. Don Baker, Camio Oil Company
Ground elevation at the stake = 1024.1
Copy of page 6, 10 CSR 50-2.030 (Permit Application) attached hereto.
Copy of staking plat for abandoned oilwell this lease also attached.

INSTRUCTIONS

On the above plat, show distance of the proposed well from the two nearest lease and section lines, and from the nearest well on the same lease completed in or drilling to the same reservoir. If the location requested is not in conformance with the applicable well-spacing rules, show all off-setting wells to the proposed well. Do not confuse survey lines with lease lines. See rule 7 - 3 (b) for survey requirements.

Remit two copies to: Missouri Oil and Gas Council
P.O. Box 250 Rolla, Mo. 65401
One will be returned.

This is to certify that I have executed a survey to accurately locate oil/gas wells in accordance with 10CSR 50-2.030 and that the results are correctly shown on above plat.

(SEAL)

26 January 1998

R. E. Mosier 2152929

Registered Land Surveyor

STATE OF MISSOURI
MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY PROGRAM

INJECTION WELL LOCATION PLAT

FORM OGC-41

RECEIVED
NOV 15 2007
Oil & Gas Council

OWNER'S NAME
INVESTMENT EQUIPMENT LLC

LEASE NAME
GLOVER FARMS # 1

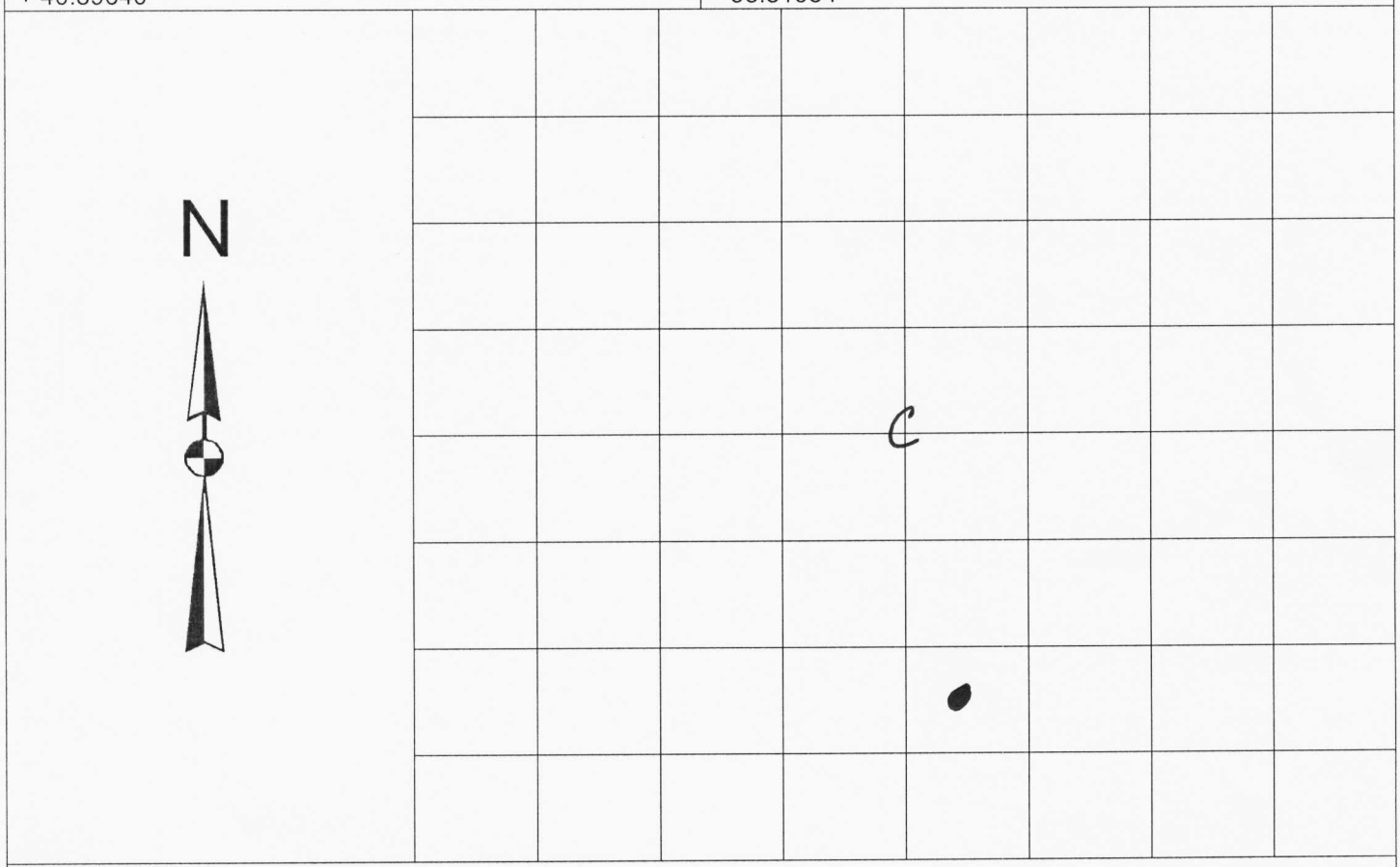
COUNTY
ATCHISON

WELL LOCATION (GIVE FOOTAGE FROM SECTION LINES)
990 ft. from ☐ North ☒ South section line 2310 ft. from ☒ East ☐ West section line

WELL LOCATION
Sec. 32 Township 65 North Range 39 ☐ East ☒ West

LATITUDE
+ 40.39640

LONGITUDE
- 95.31934



REMARKS
CHANGE GLOVER FARMS # 1 WELL FROM PERMITTED FOR INJECTION TO A PRODUCING WELL, PREVIOUS OWNER, STONE PETROLEUM CORP., PERMITTED GLOVER FARMS # 1 FOR INJECTION FUT NEVER CONVERTED WELL OR INJECTED ANY WATER.

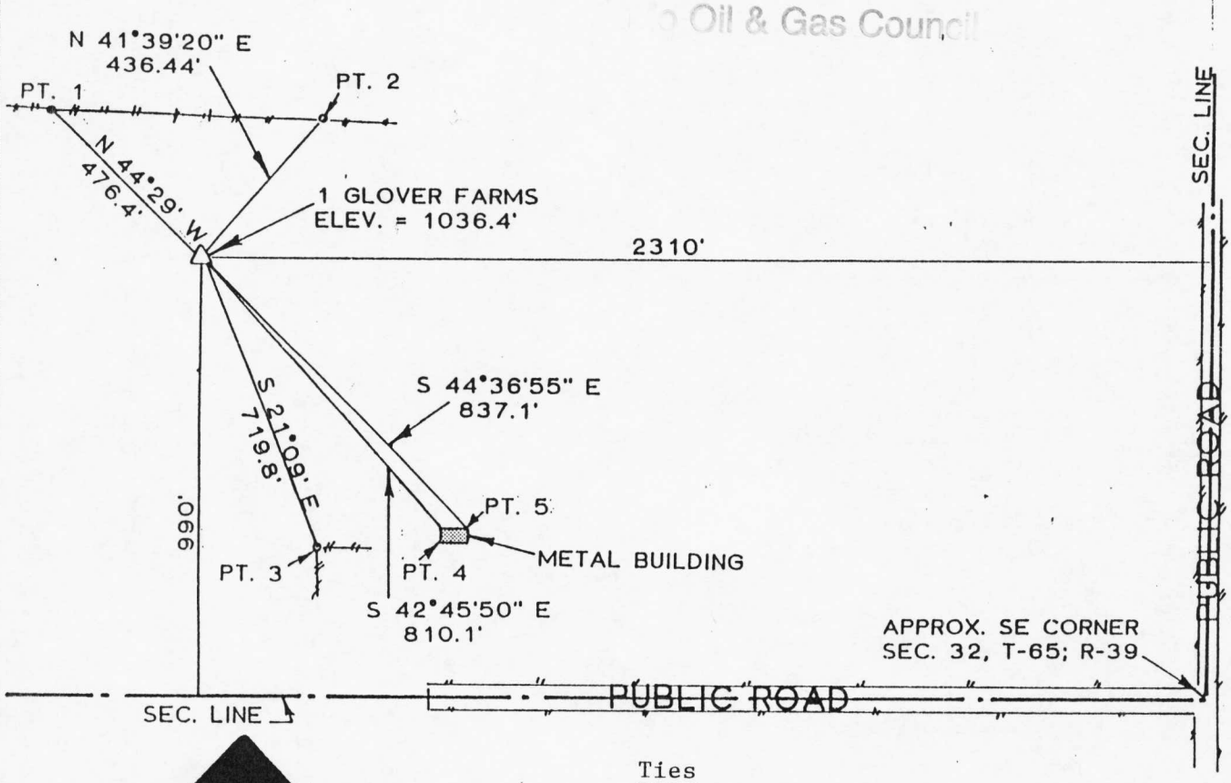
INSTRUCTIONS

On the above plat, show distance of the proposed well from the two nearest section lines, the nearest lease line, and from the nearest well on the same lease completed in or drilling to the same reservoir. Do not confuse survey lines with lease lines. See rule 10 CSR 50-2.030 for survey requirements. Lease lines must be marked.

This is to certify that I have executed a survey to accurately locate oil and gas wells in accordance with 10 CSR 50-2.030 and that the results are correctly shown on the above plat.

~~REGISTERED LAND SURVEYOR~~ Dale Robb OWNER MANAGING MEMB ~~NUMBER~~ 11-14-2007

MO 780-1136 (09-01) REMIT TWO (2) COPIES TO: MISSOURI OIL AND GAS COUNCIL, PO BOX 250, ROLLA, MO 65402 573/ 368-2165.



Ties

1. Spike & Shinner in Hedge corner post.
2. Nail/Cap in Hedge corner post.
3. Nail/Cap in Hedge corner post.
4. NW corner metal building.
5. NE corner metal building.

LEASE NAME # 1 Glover Farms COUNTY Atchison

LOCATION: 990' from South section line and 2310' from East section line, Section 32, Township 65, Range 39, Atchison County, Missouri.

REMARKS: Ground elevations at well is 1036.4. Elevations are in reference to USGS vertical datum.

I FURTHER CERTIFY that the above plat and survey were made by me or under my direct personal supervision and that I am a duly Registered Land Surveyor under the laws of the State of Missouri.

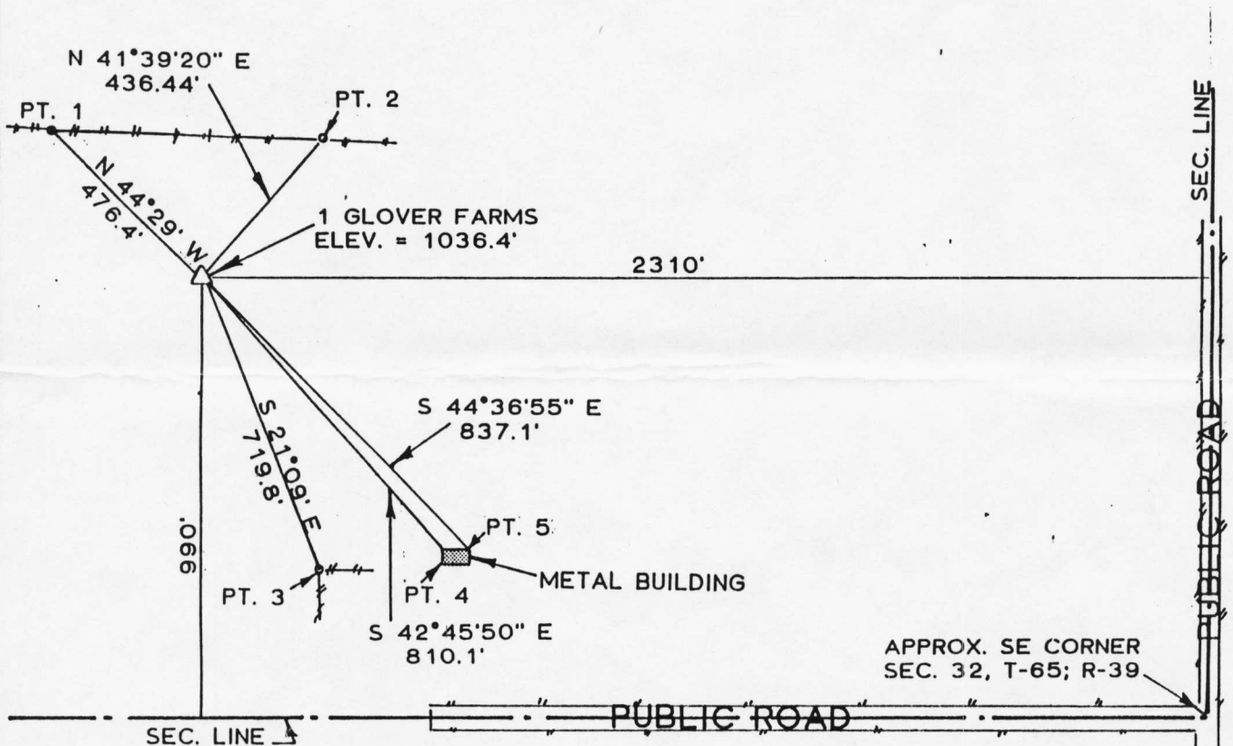
WITNESS hand and seal this Twenty-Seventh (27th) day of April, 1989.

John Teale, L.S.
Missouri L.S. 1724

STATE OF MISSOURI
JOHN R. TEALE
NUMBER LS-1724
REGISTERED LAND SURVEYOR

WELL LOCATION PLAT FOR:
STONE PETROLEUM
LAFAYETTE, LA.

MIDLAND ENGINEERING, INC.
Civil Engineers · Surveyors
501 North Market Maryville, MO 64468
4730 Frederick St Joseph, MO 64506



Ties

1. Spike & Shinner in Hedge corner post.
2. Nail/Cap in Hedge corner post.
3. Nail/Cap in Hedge corner post.
4. NW corner metal building.
5. NE corner metal building.

LEASE NAME # 1 Glover Farms COUNTY Atchison

LOCATION: 990' from South section line and 2310' from East section line, Section 32, Township 65, Range 39, Atchison County, Missouri.

REMARKS: Ground elevations at well is 1036.4. Elevations are in reference to USGS vertical datum.

I FURTHER CERTIFY that the above plat and survey were made by me or under my direct personal supervision and that I am a duly Registered Land Surveyor under the laws of the State of Missouri.

WITNESS hand and seal this Twenty-Seventh (27th) day of April, 1989.

John Teale, L.S.
Missouri L.S. 1724

STATE OF MISSOURI
JOHN R. TEALE
NUMBER LS-1724
REGISTERED LAND SURVEYOR

WELL LOCATION PLAT FOR:
STONE PETROLEUM
LAFAYETTE, LA.

MIDLAND ENGINEERING, INC.
Civil Engineers · Surveyors
501 North Market Maryville, MO 64468
4730 Frederick St Joseph, MO 64506

Missouri Oil and Gas Council

Form OGC-5

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

New Well XXX ☐ Workover ☐ Deepen ☐ Plug Back ☐ Injection ☐ Same Reservoir ☐ Different Reservoir ☐ Oil XX ☐ Gas ☐ Dry ☐

Owner: The Stone Petroleum Corporation		Address: P. O. Box 52807 Lafayette, LA 70505		
Lease Name: Glover Farms		Well Number: 1		
Location: 990' FSL & 2310' FEL			Sec., Twp., and Range or Block and Survey: Sec 32 T65N R39W	
County: Atchison	Permit number (OGC 3 or OGC 3I): 20043			
Date spudded: 5/8/89	Date total depth reached: 5/12/89	Date completed, ready to produce or inject: 6/30/89	Elevation (DF, RKR, RT, or Gr.) feet: 1042.4'KB;1036.4Gr	Elevation of casing hd. flange feet: +1' GL
Total depth: 1,989'	P.B.T.D.: 1,407' (CIBP)			
Producing or injection interval(s) for this completion: Blue Jacket 1398-1403		Rotary tools used (interval) From 0 to 1,989' Drilling Fluid used: Lignosulfinate	Cable tools used (interval) From — to —	
Was this well directionally drilled? No.	Was directional survey made? NO	Was copy of directional survey filed? NO	Date filed: No	
Type of electrical or other logs run (list logs filed with the State Geologist): Dual Induction - SFL			Date filed: 7/7/89	

CASING RECORD

Casing (report all strings set in well -- conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb. ft.)	Depth set	Sacks cement	Amt. pulled
Surface	12 1/4"	8 5/8"	24.0#	353'	250	0
Production	7 7/8"	5 1/2"	17.0#	1,514'	155	0

TUBING RECORD (Tbg Anchor)

Size	Depth set	~~Packer~~ set at	Size
2 3/8 in.	1,398 ft.	1,333 ft.	N/A in.

LINER RECORD

Top	Bottom	Sacks cement	Screen (ft.)
N/A ft.	N/A ft.	N/A	N/A

PERFORATION RECORD

Number per ft	Size & type	Depth Interval
4JSPF	4" Gun	1398-1403'

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

Amount and kind of material used	Depth Interval
250 Gals Diesel - Surfactant	1398'-1403'

INITIAL PRODUCTION

Date of first production or injection: 7-3-89

Producing method (indicate if flowing, gas lift, or pumping -- if pumping, show size and type of pump): Pumping - B - 25D-67-36, 1 1/2" insert pump

Date of test	Hrs. tested	Choke size	Oil produced during test	Gas produced during test	Water produced during test	Oil gravity
7/25/89	24		2.9 bbls.	- MCF	6.7 bbls.	28.2 API (Corr.)

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hours	Oil	Gas	Water	Gas -- oil ratio
-	-		2.9 bbls.	- MCF	6.7 bbls.	-

Disposition of gas (state whether vented, used for fuel or sold): -

Method of disposal of mud pit contents:

CERTIFICATE: I, the undersigned, state that I am the Agent of the The Stone Petroleum Corporation (company), and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

RECEIVED
AUG 08 1989
MO Oil & Gas Council
Economic Geology

Michael E. Madden
Signature

3/12/1982

DETAIL OF FORMATIONS PENETRATED			
Formation	Top	Bottom	Description (See * below)
Lansing	585'	848'	Sandstone
Cherokee	1305'	1355'	Sandstone
Mississippi	1748'	1989'	Sandstone

*Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS

Attach drillers log or other acceptable log of well. Submit analysis of injection interval formation waters.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI OIL AND GAS COUNCIL
WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

Form OGC-5

RECEIVED
MAR 30 2001
MO Oil & Gas Cour

☐ NEW WELL ☐ WORKOVER ☐ DEEPEN ☐ PLUG BACK ☒ INJECTION ☐ SAME RESERVOIR ☐ DIFFERENT RESERVOIR ☐ OIL ☐ GAS ☐ DRY

OWNER: Don Baker dba Camio Oil Company	ADDRESS: P.O. Box 308, Augusta, KS 67010
LEASE NAME: Glover Farm	WELL NUMBER: 1
LOCATION: 990' S & 2310' E	SEC. TWP. AND RANGE OR BLOCK AND SURVEY: 32-65N-39W
COUNTY: Atchison	PERMIT NUMBER (OGC-3 OR OGC-3I): 20043

DATE SPUDDED	DATE TOTAL DEPTH REACHED	DATE COMPLETED READY TO PRODUCE OR INJECT	ELEVATION (DF, RKR, RT, OR Gr.) FEET	ELEVATION OF CASING HD. FLANGE FEET
5/8/89	5/12/89	6/30/89	1036.4 GR	

TOTAL DEPTH	PLUG BACK TOTAL DEPTH
1989	1407'

PRODUCING OR INJECTION INTERVAL(S) FOR THIS COMPLETION	ROTARY TOOLS USED (INTERVAL) 0 TO 1989'	CABLE TOOLS USED (INTERVAL)
Blue Jacket 1398-1403	DRILLING FLUID USED lighosulfinate	N/A

WAS THIS WELL DIRECTIONALLY DRILLED?	WAS DIRECTIONAL SURVEY MADE?	WAS COPY OF DIRECTIONAL SURVEY FILED?	DATE FILED
no	no	no	N/A

TYPE OF ELECTRICAL OR OTHER LOGS RUN (LIST LOGS FILED WITH THE STATE GEOLOGIST)	DATE FILED
Dual Induction SFL	7/7/89

CASING RECORD

CASING (REPORT ALL STRINGS SET IN WELL - CONDUCTOR, SURFACE, INTERMEDIATE, PRODUCING, ETC.)

PURPOSE	SIZE HOLE DRILLED	SIZE CASING SET	WEIGHT (LB. FT)	DEPTH SET	SACKS CEMENT	AMOUNT PULLED
surface	12-1/4	8-5/8	24	353	250	
Longstring	7-7/8	5½	17	1514	155	

TUBING RECORD

SIZE IN.	DEPTH SET FEET	PACKER SET AT FEET	SIZE INCH

LINER RECORD

TOP FEET	BOTTOM FEET	SACKS CEMENT	SCREEN FEET

PERFORATION RECORD

NUMBER PER FEET	SIZE AND TYPE	DEPTH INTERVAL
4JSPF	4" gun	1398-1430

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

AMOUNT AND KIND OF MATERIAL USED	DEPTH INTERVAL
250 Gal diesel-surfactant	1398-1403

INITIAL PRODUCTION

DATE OF FIRST PRODUCTION OR INJECTION	PRODUCING METHOD (INDICATE IF FLOWING, GAS LIFT, OR PUMPING — IF PUMPING, SHOW SIZE AND TYPE OF PUMP.

DATE OF TEST	HOURS TESTED	CHOKE SIZE	OIL PRODUCED DURING TEST bbls.	GAS PRODUCED DURING TEST MCF	WATER PRODUCED DURING TEST bbls.	OIL GRAVITY API (CORR.)

TUBING PRESSURE	CASING PRESSURE	CAL'TED RATE OF PRODUCTION PER 24 HOURS	OIL bbls.	GAS MCF	WATER bbls.	GAS OIL RATIO

DISPOSITION OF GAS (STATE WHETHER VENTED, USED FOR FUEL OR SOLD)

METHOD OF DISPOSAL OF MUD PIT CONTENTS

CERTIFICATE: I, THE UNDERSIGNED, STATE THAT I AM THE Owner OF THE Camio Oil Company COMPANY, AND THAT I AM AUTHORIZED BY SAID COMPANY TO MAKE THIS REPORT, AND THAT THIS REPORT WAS PREPARED UNDER MY SUPERVISION AND DIRECTION AND THAT THE FACTS STATED THEREIN ARE TRUE, CORRECT AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DATE	SIGNATURE
March 28 01	Don Baker

MO 780-0215 (1-86) (Rev. 1-86)

RECEIVED
AUG 09 2000
MO Oil & Gas Council

PUBLIC NOTICE OF DISPOSAL/INJECTION WELL

Camio Oil Company, P.O. Box 308, Augusta, Kansas 67010, has applied for an application to convert the No. 1 Glover Farm well into a disposal/injection well disposing fresh water into the Blue Jacket formation at an approximate depth of 1398 feet - 1462 feet, at a location 990 feet from the South line and 2310 feet from the East line of Section 32, Township 65 North, Range 39 West in Atchison County, Missouri.

Written comments or request for additional information regarding such well should be directed, within fifteen (15) days of this notice to:

State Geologist
Missouri Oil & Gas Council
P.O. Box 250
Rolla, MO 65401

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI OIL AND GAS COUNCIL
INJECTION WELL SCHEMATIC

COUNTY	PERMIT NUMBER	OPERATOR	WELL NUMBER
ATCHINSON	20043	CAMIO OIL	#1

ELEVATION 1036'4

DATE COMMENCED MAY 8th 89

DATE COMPLETED JUNE 30-89

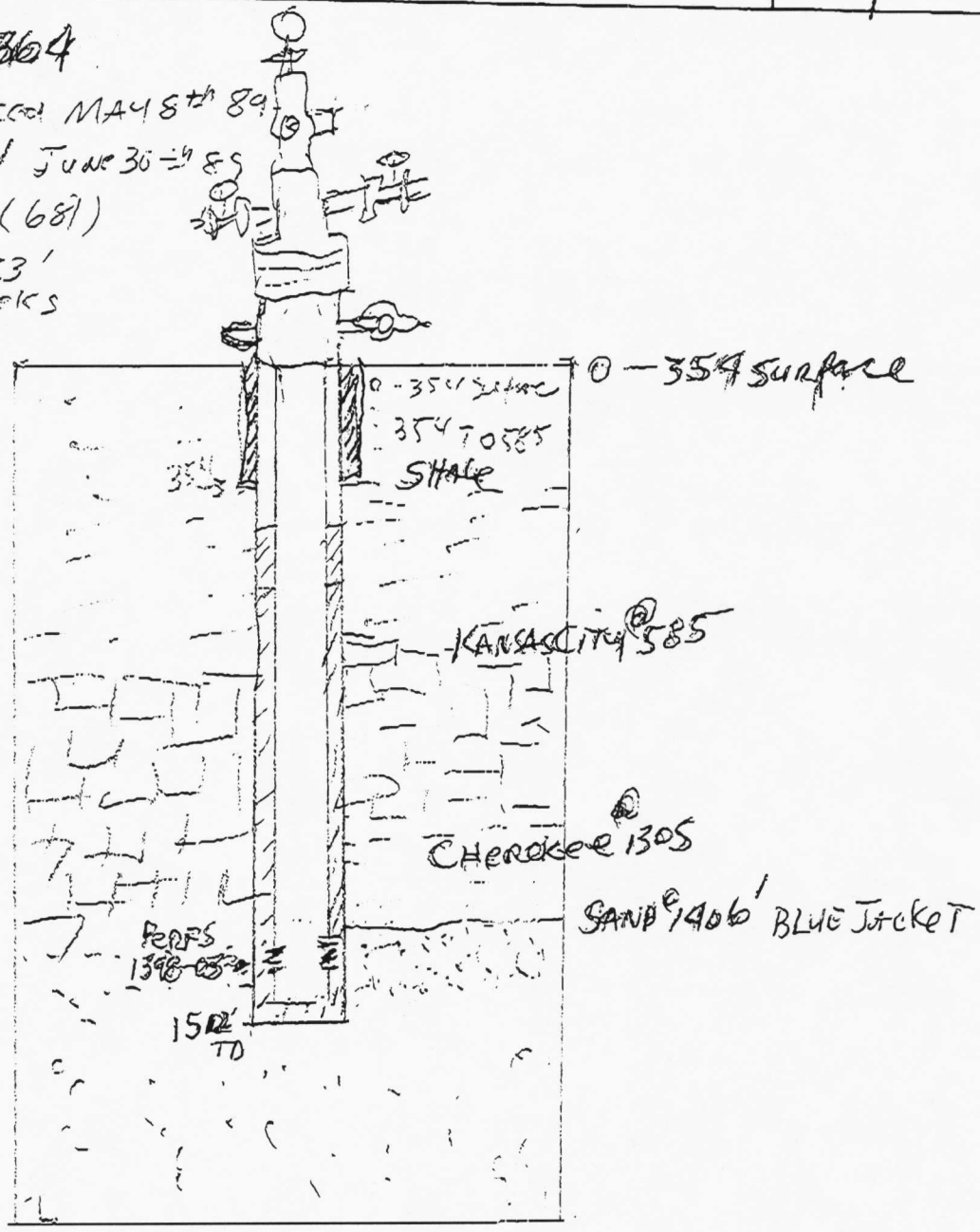
12 3/4 HOLE 0-354 (681)

8 5/8" CASING SET 353'

CEMENT WITH 185 SACKS

5 1/2" CASING SET @ 1514' WITH 165 SAX OF CEMENT

T.D 1512' (-476)



Perforation
6-25-89 1398 - 1403
5 SHOTS PER FOOT

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 1

To	Sherri Stoner	From	Don BAKER
Co.	State of Missouri	Co.	Camio Oil Co
Dept.	of Natural Resources	Phone #	316-775-1955
Fax #	573-368-2111	Fax #	316-775-5810

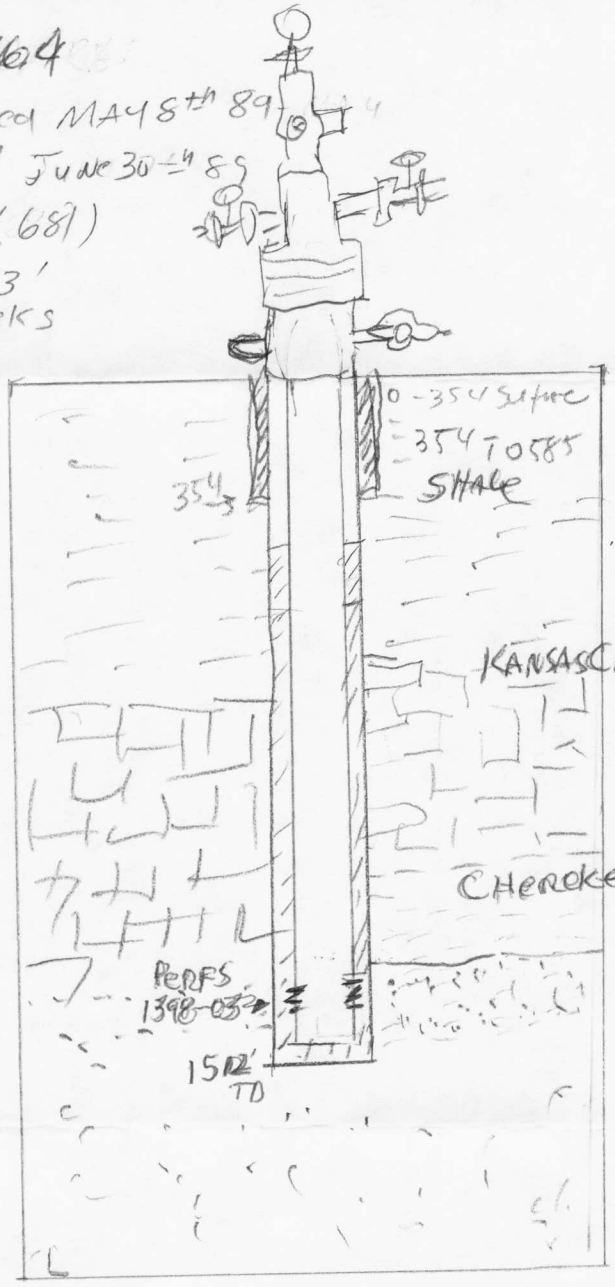
INSTRUCTIONS ON THE ABOVE SPACE DRAW A NEAT, ACCURATE SK CONFIGURATION OF WELL HEAD. TOTAL DEPTH OR PLUG BACK TOTAL DEPTH LITHOLOGY OF ALL FORMATIONS PENETRATED. DEPTHS OF THE TOPS AND BI AND THE TYPE AND DEPTH OF PACKER. DEPTH, LOCATION, AND TYPE OF ALL CEMENT. DEPTH OF ALL PERFORATIONS AND SQUEEZE JOBS, AND GEOLOGIC NAME AND DEPTH TO BOTTOM OF ALL UNDERGROUND SOURCES OF DRINKING WATER WHICH MAY BE AFFECTED BY THE INJECTION. USE BACK IF ADDITIONAL SPACE IS NEEDED, OR ATTACH SHEET

MO. 780-0221 (9-87)

MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI OIL AND GAS COUNCIL
INJECTION WELL SCHEMATIC

COUNTY	PERMIT NUMBER	OPERATOR	WELL NUMBER
ATCHINSON	20043	CAMIO OIL	#1

ELEVATION 1036[illegible]
DATE Commenced MAY 8th 89
DATE Completed June 30th 89
12 3/4 HOLE 0-354 (681)
8 5/8" CASING SET 353'
Cement with 250 Sacks
5 1/2" CASING Set @
1514' WITH 165
Sax of Cement -
T.D 1512' (-476)



RECEIVED
MAR 30 2001
MO Oil & Gas Council

0-354 surface

Perforation
6-25-89 1398 - 1403
5 SHOTS PER FOOT

INSTRUCTIONS ON THE ABOVE SPACE DRAW A NEAT, ACCURATE SCHEMATIC DIAGRAM OF THE APPLICANT INJECTION WELL, INCLUDING THE FOLLOWING: CONFIGURATION OF WELL HEAD, TOTAL DEPTH OR PLUG BACK TOTAL DEPTH, DEPTH OF ALL INJECTION OR DISPOSAL INTERVALS, AND THEIR FORMATION NAMES, LITHOLOGY OF ALL FORMATIONS PENETRATED, DEPTHS OF THE TOPS AND BOTTOMS OF ALL CASING AND TUBING, SIZE AND GRADE OF ALL CASING AND TUBING, AND THE TYPE AND DEPTH OF PACKER, DEPTH, LOCATION, AND TYPE OF ALL CEMENT, DEPTH OF ALL PERFORATIONS AND SQUEEZE JOBS, AND GEOLOGIC NAME AND DEPTH TO BOTTOM OF ALL UNDERGROUND SOURCES OF DRINKING WATER WHICH MAY BE AFFECTED BY THE INJECTION. USE BACK IF ADDITIONAL SPACE IS NEEDED, OR ATTACH SHEET

MISSOURI
Mechanical Integrity Test

CA027

Test Date: March 14, 2001

RECEIVED
MAR 30 2001
MO Oil & Gas Council

Operator: Camio Oil Co.
Address: P.O. Box 308
Augusta, KS 67010
Contact: Mr. Don Baker
Phone: 316-775-1551

Lease: Glover Farm *Well No.*: 1
County: Atchison *Permit No.*: 20043

TEST INFORMATION

Pressure [X] Radioactive Tracer Survey [ ] Temperature Survey [ ]

	Run #1	Run #2	Run #3	Run #4
Start Time:	10:40			
End Time:	11:10			
Length of Test:	30 min.			
Initial Pressure (PSI):	480 lbs			
Ending Pressure (PSI):	450 lbs			
Pressure Change:	-30 lbs			

Fluid Used For Test (water, nitrogen, CO2, etc.): air

Perforations: 1398' – 1403'

Comments: 378' to water
1398' – 378' = 1020' X .433 = 442#

The bottom of the tested zone is shut in with _____ at a depth of _____ feet. In signing the form below, it is certified that the above indicated well was tested for mechanical integrity on the test date shown above.

Signature Don Baker
Operator, Contact Person or Approved Agent

Owner 3/28/01
Title

FOR INTERNAL USE ONLY

Results were: Satisfactory X Not Satisfactory ____ Computer Update: X

Remarks: _____

State Agent: SAS Witnessed: Yes X No ____

!! FILE WITH PERMIT !!

OGC Misc Form 1

DNR MISSOURI SAMPLE WELL-LOG LIBRARY DGLS

LOG NUMBER
028690

OWNER: STONE PETROLEUM CORP.
PLUGGED N CONFIDENTIAL? RELEASE DATE:
WELL TYPE: Oil Well
DRILLER: EDCO
DRILL DATE: 05/198 PERMIT #:
LOGGER: K. DEASON LOGDATE: 09/198
TYPE OF LOG: S SAMPLE SAVED? N

MO , COUNTY ATCHISON
SECTION: 32 TOWNSHIP: 65N RANGE 39W
C of SW of SE
LATITUDE:
LONGITUDE:
QUAD NAME:

OTHER DATABASES: API OIL AND GAS FILE
ID NUMBER: 005-20043
DATABASE 2:
ID NUMBER:
DATABASE 3
ID NUMBER

ELEVATION: 1036 BASE: S BEDROCK @ 375 FEET
TOTAL DEPTH: 1990 INTERVAL CORED: 0 TO 0
YIELD: DRAWDOWN:
STATIC WATER LEVEL BEFORE: AFTER:

WATER AT: TLT

TOP FORMATION: SHAWNEE GROUP
BOTTOM FORMATION: KINDERHOOKIAN SERIES

REMARKS: #1 GLOVER FARMS - 29 BBLS/DAY OIL - 28.2 GRAVITY

CONSTRUCTION DATA

	DEPTH:	DIAMETER	CASING MATERIAL
CASING:	0	0	
	0	0	
	0	0	
	0	0	

I/O: 0
SIZE HOLE: 0

DATE PLUGGED: DATE ABANDONED:
Plug Depth TOP 0 Plug Depth Bottom: 0
GROUTING:

PUMP:

Capacity	Pump Type	Set at	Total Depth	Screen Type:	Size:	Length:	Slot:
0		0	0		0	0	0

Well Treatment: Type Devised:
Type of Completio
Perforation Interval: Top: 0 Bottom 0
Tube Pressure:
Oil Production: 9999 Gas Production: 00039999

Water Analysis:

OPEN FORMATIONS Top Formation:
Bottom Formation:

LOG NUMBER
028690

STRATIGRAPHY

TOP	BOT	FORMATION NAME	LITHOLOGY PRIMARY	SECONDARY	MINOR	MINERALS PRIMARY	OCC.	SECONDAR	OCC	MINOR
0	375	DRIFT	SAND	GRAVEL	CLAY		0		0	
375	577	VIRGILIAN SERIES					0		0	
375	450	SHAWNEE GROUP	SHALE	LIMESTONE			0		0	
450	577	DOUGLAS GROUP	SHALE				0		0	
577	910	MISSOURIAN SERIES					0		0	
577	595	PEDEE GROUP	SHALE	LIMESTONE			0		0	
595	900		SHALE	LIMESTONE			0		0	
900	910	PLEASANTON GROUP	SHALE				0		0	
910	1750	DESMOINESIAN SERIES					0		0	
910	1025	MARMATON GROUP	SHALE	LIMESTONE			0		0	
1025	1750	CHEROKEE GROUP	SHALE	SAND	LIMESTONE		0		0	
1359	1360	SEVILLE LIMESTONE	LIMESTONE				0		0	
1750	1990	MISSISSIPPIAN SYSTEM					0		0	
1955	1990	KINDERHOOK SHALE	SHALE				0		0	
1990	1955		LIMESTONE	CHERT	SHALE		0		0	
1990	0	TOTAL DEPTH					0		0	

COUNTY: ATCHISON API: 24 005 20043

COMPANY NAME: GLOVER FARMS COMPANY NUMUMBER: GLOO1

LEASENAME: GLOVER FARMS WELL NUMBER: 1

WELL ORDER: 1

ORIGINAL OPERATOR: STONE PETROLEUM CORP.

WELL TYPE: 1 WELL STATUS: AC BONDED Y/N: Y

Procedure Dates:

DATEAPPROV:	5/4/89
CAN_DT:	
SPUD_DATE:	5/8/89
COMPL_DT:	6/30/89
PLUG_DT:	

TOWNSHIP: 65 RANGE: 39 SECTION: 32

SURVEYLOC1: 990 FSL SURVEYLOC2: 2310 FEL

LATITUDE: LONGITUDE: ELEVATION: 1036

PROPOSEDTD: 2000 ACTUALTD: 1989 LOG_DEPTH: 0 PBTD: 1407

PERF_INT: LOG_TYPE: DI;CNL

IP: 2.9 BBL, 24 HR SPL_LOC:

GRAVITY: 28.2 GOR: PROD FORM: BLUE JACKET

MIT_1: MIT_2: MIT_3: MIT_4: LAST_MIT:

WIT_1: WIT_2: WIT_3: WIT_4: LASTMITWIT:

MITCOMMENT:

INSP_1: INSP_2: INSP_3:

COMMENT: PROD OIL

Print Form | U - Update File | R - Return to Permit Menu | Select Action by Clicking on Button or Typing Number or Letter:

TABLE OF CONTENTS

SUMMARY

The Blue Jacket reservoir zone in this well consists of fine grained (0.15-0.18 mm), well sorted, poorly consolidated, quartzose sandstones. The rocks are friable and are susceptible to mechanical failure if high differential pressures are drawn across the formation face. The rocks contain very little cement (1-3%), primarily authigenic clay. The clay consists largely of iron-rich chlorite and kaolinite as well as smaller quantities of illite and illite-smectite (20% expandable).

Blue Jacket sandstones have thin section porosities of 19 to 30 percent. Porosity in these rocks is largely intergranular in nature. Pores are large and well interconnected resulting in high formation permeability (estimated to be several hundred md). The rocks have sufficient porosity and permeability to yield oil to the wellbore if tested.

Blue Jacket sandstones have limited susceptibility to damage from contact with fluids. The rocks are not susceptible to damage from contact with fresh water based fluids, HCl acid, or HF acid. The rocks are not susceptible to clay particle migration and pore throat blockage effects. The reservoir sand body may be safely drilled with fresh water based mud systems. Cements may be made up in fresh water without fear of damaging the formation. Filtered brine such as 2% KCl water may be used as completion fluid. Perforate underbalanced (4 shots/ft) with a low differential pressure (a few hundred psi or less). Sand control may be achieved by gravel packing with 20/40 mesh gravel and a 0.012 inch screen. The formation may be acidized with 12-15% chelated HCl acid containing nonemulsifying surfactant or mutual solvent additives.

Richard K. Vessell

Richard K. Vessell, Ph.D.
Vice President-Operations

David K. Davies

David K. Davies, Ph.D.
President
Certified Professional
Geologist No. 4188

BLUE JACKET SANDSTONES
NO. 1 GLOVER FARMS WELL

INTRODUCTION

Five (5) core samples recovered from the 1401-1405 foot interval in the No. 1 Glover Farms Well, Atchison County, Missouri have been examined in this study (Figure 1). These core samples are representative of a potential Blue Jacket reservoir zone in the well. All three (3) core samples have been examined by thin section petrographic, X-ray diffraction, and scanning electron microscope techniques (Table 1). These analyses have yielded quantitative information concerning rock texture and composition, cementation, pore system geometry, and formation susceptibility to damage. The primary objectives of this study are to evaluate the reservoir potential and probable producibility of the cored interval and to determine what types of stimulation procedures will produce the least formation damage.

The results of thin section point count analysis are summarized in Tables 2, 3, and 5 and as a series of color photomicrograph plates. X-ray diffraction analysis is presented in Table 4. Scanning electron photomicrographs of each sample, illustrating development of porosity and cementation, are presented as a series of black and white plates in the back of this report.

Our interpretations and recommendations are based solely on the analyses performed in this study. We make the assumption that all samples are truly representative of the intervals of interest. All data, interpretations and recommendations presented in this report are considered highly confidential, and the sole proprietorship of The Stone Petroleum Corporation. Four (4) copies of this report have been distributed pursuant to the request of Mr. Edward A. Eble of The Stone Petroleum Corporation. David K. Davies and Associates retains one copy of this report for possible use in future consultation with authorized personnel on specific details relating to this study.

BLUE JACKET SANDSTONES
NO. 1 GLOVER FARMS WELL

RESULTS AND INTERPRETATION

Lithology-Texture- All three (3) of the core samples examined in this study are sandstones. The rocks are fine grained (0.15-0.18 mm, Table 2). The 1401 foot sandstone sample contains 10 percent laminar depositional shale. The 1402 and 1405 foot sandstone samples are well sorted and contain very little depositional shale (0-1%).

Framework sand grains are subangular to subrounded and nonspherical in shape. Framework grains have a loose, open packing arrangement. The rocks are poorly indurated and are susceptible to mechanical failure if high differential pressures are drawn across the formation face.

Composition- The sandstones are quartzose. The most abundant framework grain constituent is monocrystalline quartz (54-62%). The rocks contain smaller quantities of polycrystalline quartz (3-11%) and chert (0-1%). Feldspars (2-3%, largely potassium feldspar) are minor rock constituents. Muscovite mica and sandstone rock fragments are accessory rock components occurring in quantities of 1 percent of less.

Cementation- Porosity and permeability have been reduced by cementation. Cements form 1 to 3 percent of the bulk volume of the sandstones. The most abundant cementing agent in the rocks is authigenic clay (trace-3%). Small, euhedral silica overgrowths and pyrite framboids are minor cementing agents.

Nature And Distribution Of Shale- Blue Jacket sandstones contain 1 to 13 percent shale by volume (Table 3). The 1401 foot sandstone sample contains the largest volume of shale. Most of the shale in this sandstone sample (10%) is depositional in origin and is distributed throughout the rock in discrete laminae. The rock also contains small amounts of dispersed authigenic clay cement (3%). The 1402 and 1405 foot sandstone samples contain relatively little shale (1-3%). All of the shale in these rocks is dispersed authigenic clay cement.

Clay Mineralogy- X-ray analysis reveals that the most abundant clay components of the rocks are kaolinite and chlorite (Table 4). The chlorite is an iron-rich variety. The rocks contain much smaller quantities of illite and illite-smectite. The illite-smectite consists of 80 percent illite layers interstratified with 20 percent smectite layers.

Reservoir Quality- Thin section point count analysis reveals that sandstones comprising the 1401-1405 foot Blue Jacket reservoir zone have porosities in the range of 19 to 30 percent (Table 5). The 1401 foot sample contains laminar depositional shale and has the lowest porosity. The 1402 and 1405 foot samples are much more porous (29-30%). All of the porosity in these sandstone is intergranular in nature. Pores are quite large (up to 110 microns diameter) and are well interconnected. The rocks have very high permeability (estimated to be several hundred md).

Our analyses reveal that the Blue Jacket sandstones have sufficient porosity and permeability to yield fluids (oil) to the wellbore at high rates of production if tested. Examination of the computed Schlumberger Cyberlook log reveals that the 1401-1410 foot portion of the sequence will be oil productive. The underlying 1410-1420 foot interval computes as transitional into water on this presentation.

Formation Sensitivity- Blue Jacket sandstones have limited susceptibility to damage from contact with fluids. The rocks contain very little illite-smectite with few expandable layers. Thus, the rocks are not susceptible to damage from contact with fresh water based fluids.

While kaolinite is detected in X-ray diffraction analysis, scanning electron microscopy reveals that the rock pore system does not contain kaolinite clay fines with morphologies which will render them susceptible to dislodgement and migration under conditions of high fluid turbulence. Thus, the rocks are not susceptible to damage from clay particle migration and pore throat blockage effects.

The sandstones are devoid of mineral phases which will react adversely with HF acid. While the rocks do contain small amounts of chlorite and pyrite, the potential for formation damage attributable to the precipitation of secondary iron-hydroxide compounds from spent acid will not be significant.

The formation could be damaged by the formation of acid-oil emulsions during stimulation. Laboratory tests are recommended to verify the compatibility of formation liquids and any acid that may be utilized in stimulation.

TREATMENT RECOMMENDATIONS

Drilling-Cementing- The potential Blue Jacket reservoir rocks are not fresh water sensitive. The reservoir sand body may be safely drilled with fresh water based mud systems. Cements may be made up in fresh water without fear of damaging the formation.

Completion Fluid Selection- The reservoir rocks are not susceptible to damage from clay swelling. Thus, selection of completion fluids need not be based upon the ability of the fluid to inhibit clay swelling. A brine such as 2% KCl water would be an appropriate fluid to utilize in completion. Care should be taken to carefully filter the completion fluid to the 2-5 micron size fraction with D.E. or cartridge filters. The completion fluid should be viscosified with HEC and should contain 2 gallons of nonionic surfactant per 1000 gallons.

Perforating- As the formation is poorly indurated and will fail mechanically if a high differential pressure is drawn across the formation face, we recommend perforating with a minimal underbalanced differential pressure (a few hundred pounds or less). Shoot 4 shots per foot 90 degrees out of phase with a casing gun over the 1401-1410 foot interval.

Sand Control- The formation is susceptible to mechanical failure due to poor consolidation. Gravel packing may be achieved with 20/40 gravel and a 0.012 inch screen.

Perforation Ball Out- Perforations may be balled out with acid. As the formation contains very little acid soluble carbonate, acidization should be viewed as a means of removing debris from perforations rather than as a means of improving formation permeability in the near wellbore region.

The formation is compatible with either HCl acid alone or a staged HCl-HF mud acid job. An HCl acid job would consist of 2-3 barrels per foot of 12-15% HCl acid containing the following additives per 1000 gallons:

1) 2 gallons of nonionic surfactant
2) a volume of mutual solvent (EGMBE) or 2 gallons of nonemulsifying surfactant
3) EDTA or citric acid as an iron chelating agent
4) corrosion inhibitor
5) diverter

If ball sealers are used as diverter, use 10% more balls than perforations. Use 1.1 density balls. Ball seating may be aided by lightly gelling the acid to about 5 cps.

TABLES

TABLE 1

ANALYSES PERFORMED
No. 1 Glover Farms Well

Sample No. D2444	Depth (ft)	Zone/ Formation	Thin Section	X-Ray Diffraction	Scanning Electron Microscopy
001	1401	Blue Jacket	X	X	X
002	1402	Blue Jacket	X	X	X
003	1405	Blue Jacket	X	X	X

TABLE 2

THIN SECTION PETROGRAPHY
No. 1 Glover Farms Well
Blue Jacket

Depth (ft)	1401	1402	1405
Sample No. D2444	001	002	003
Grain Size (mm)	0.18	0.15	0.17
Overall Sorting	WS	WS	WS
GRAIN COMPOSITION			
Mono Quartz	54	62	56
Poly Quartz	11	3	9
Chert	Tr	1	-
Muscovite	Tr	Tr	Tr
Biotite	-	-	-
K-Feldspar	3	2	2
Plagioclase	Tr	Tr	Tr
Igneous RF`s	-	-	-
Metamorphic RF`s	-	-	-
Sandstone RF`s	-	1	-
Shale Fragments	-	-	-
Glauconite	-	-	-
Carbonate Fragments	-	-	-
Plant Remains	-	-	-
Heavy Minerals	-	-	-
DEPOSITIONAL SHALE			
Laminar	10	-	-
Dispersed	-	1	1
CEMENTS			
Clay	3	Tr	2
Silica	Tr	Tr	Tr
Calcite	-	-	-
Dolomite	-	-	-
Siderite	-	-	-
Pyrite	Tr	1	Tr
Other Minerals	-	-	-
POROSITY			
Pores	19	29	30
TOTALS			
Quartz/Chert	65	66	65
Shale/Clay	13	1	3
Carbonates	0	0	0
Other Minerals	3	4	2
Porosity	19	29	30
Total Percentages	100	100	100

TABLE 3

SHALE DISTRIBUTION
No. 1 Glover Farms Well
Blue Jacket

Sample No. D2444	Depth (ft)	Laminar Shale	Structural Shale	Dispersed Shale	Total Shale(TS)
001	1401	10	0	3	13
002	1402	0	0	1	1
003	1405	0	0	3	3

TS = Total shale volume derived from thin section analysis.

TABLE 4

X-RAY DIFFRACTION MINERALOGY
No. 1 Glover Farms Well
Blue Jacket

Depth (ft)	1401	1402	1405
Sample No. D2444	001	002	003
CLAYS			
Smectite	-	-	-
Illite-Smectite(*)	1	-	-
Illite	2	Tr	Tr
Kaolinite	5	1	2
Chlorite	4	1	2
Others	-	-	-
CARBONATES			
Ankerite	-	-	-
Calcite	-	-	-
Dolomite	-	-	-
Siderite	-	-	-
Others	-	-	-
OTHER MINERALS			
Quartz	86	98	94
K-Feldspar	2	Tr	2
Plagioclase	-	-	-
Pyrite	-	-	-
Anhydrite	-	-	-
Others	-	-	-
DRILL SOLIDS			
Bentonite	-	-	-
Halite	-	-	-
Barite	-	-	-
TOTALS			
Total Clays	12	2	4
Total Carbonates	0	0	0
Total Other Minerals	88	98	96
Total Drill Solids	0	0	0
Total Percentages	100	100	100

(*) Mixed layered clay - contains 20% expandable smectite layers.

TABLE 5

SUMMARY OF WHOLE ROCK ANALYSIS AND POROSITY VARIETIES
No. 1 Glover Farms Well
Blue Jacket

	Depth (ft)		1401	1402	1405
	Sample No.	D2444	001	002	003
	Grains %		68	69	67
	Matrix % *		10	1	1
	Cement %		3	1	2
POROSITY	Primary %		19	29	30
	Secondary %		0	0	0
	Micro %		0	0	0
	Total Porosity %		19	29	30
	Total Percentages		100	100	100

* Fines deposited simultaneously with the sand grains ("depositional shale").

TABLE 6

POTENTIAL FORMATION DAMAGE MECHANISMS
No. 1 Glover Farms Well
Blue Jacket

Sample No. D2444	Depth (ft)	Migration of Fines	Sensitivity		
			Fresh Water	HCl Acid	HF Acid
001	1401	-	-	Tr	-
002	1402	-	-	Tr	-
003	1405	-	-	Tr	-

X = Major potential for damage
\+ = Moderate potential for damage
Tr = Minor potential for damage
\- = No potential for damage

FIGURES

FIGURE 1

NO. 1 GLOVER FARMS WELL

LOG RESPONSE AND SAMPLE LOCATIONS ARE ILLUSTRATED

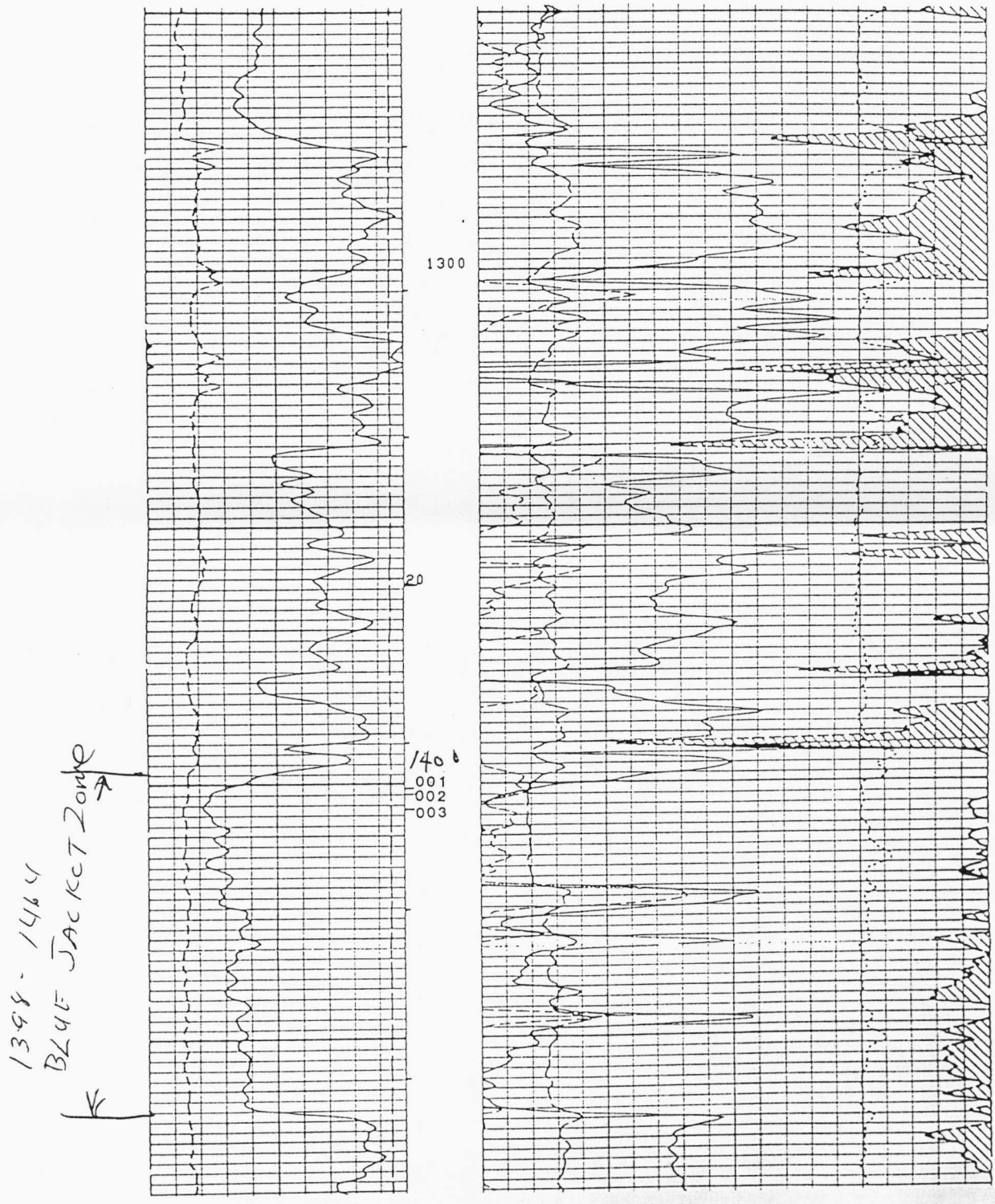


FIGURE 2

THIN SECTION PHOTOMICROGRAPHS

BLUE JACKET SANDSTONE

NO. 1 GLOVER FARMS WELL

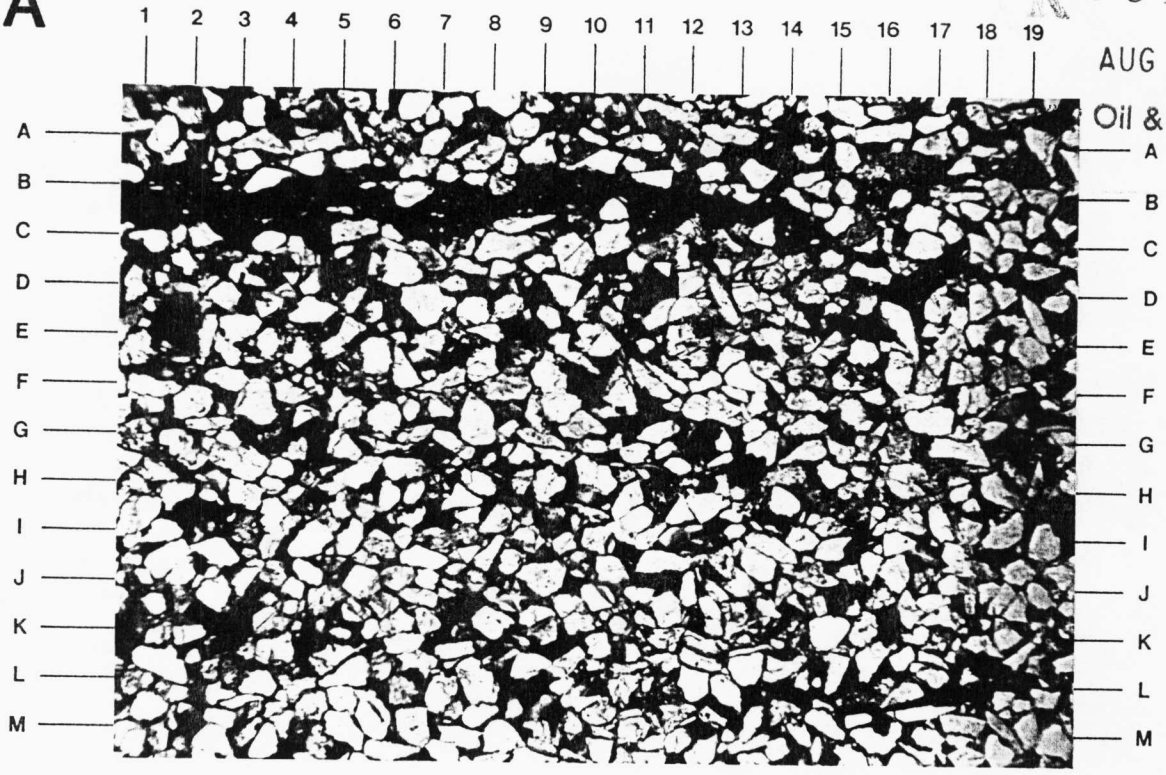
Depth: 1401 Feet	Sample: D2444-001
Grain Size: 0.18 mm	Sorting: Well Sorted
Photograph Scale A = 0.50 mm	B = 0.125 mm

Photograph A is a low magnification survey view of the sample illustrating the fine grained, well sorted nature of sandstones comprising this portion of the reservoir sequence. The sandstone contains a few thin layers of depositional shale (brown, B-2). Clean sand layers are highly porous (blue) and permeable. Rocks with this type of pore system geometry are capable of yielding fluids to the wellbore if tested.

Photograph B is a high magnification view of the sample. The rock consists of angular to subangular grains of monocrystalline quartz (A-9) as well as smaller quantities of feldspar (K-11), and muscovite (elongate grain, K-14). The rock is characterized by well developed intergranular porosity (blue). Pores and pore throats are partially occluded by authigenic clay cement (green rims on grains).

Note: All thin sections have been impregnated with blue epoxy resin. In sandstones, the blue areas are pores. Each sample has been stained with Alizarin Red "S". Calcite is therefore red.

A



Scale

B

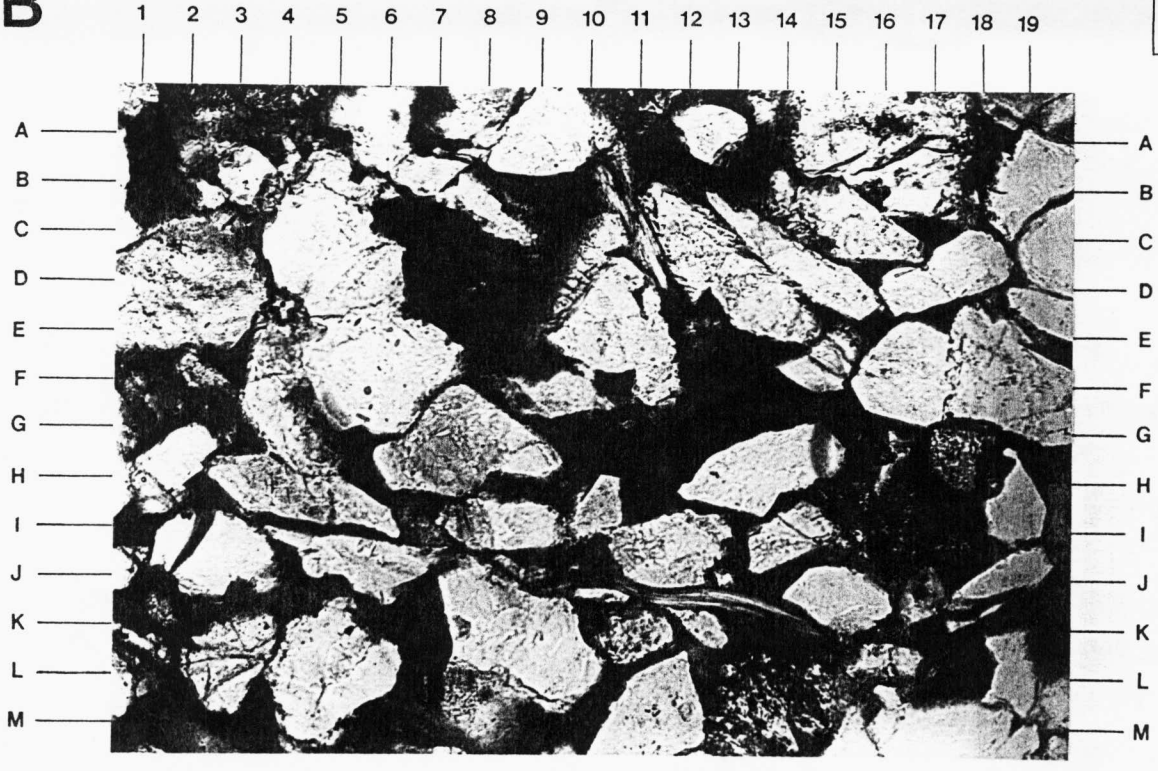


FIGURE 3

SCANNING ELECTRON MICROSCOPY

BLUE JACKET SANDSTONE

NO. 1 GLOVER FARMS WELL

1401 Feet

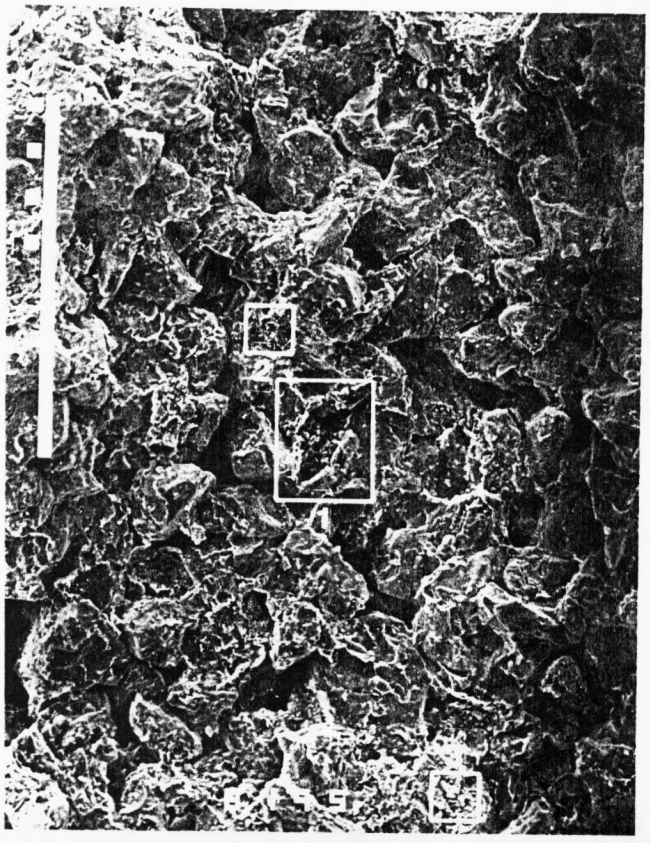
Photomicrograph	Bar Scale*	Magnification
8195	1000	45X
8196	100	300X
8197	100	700X
8198	100	700X

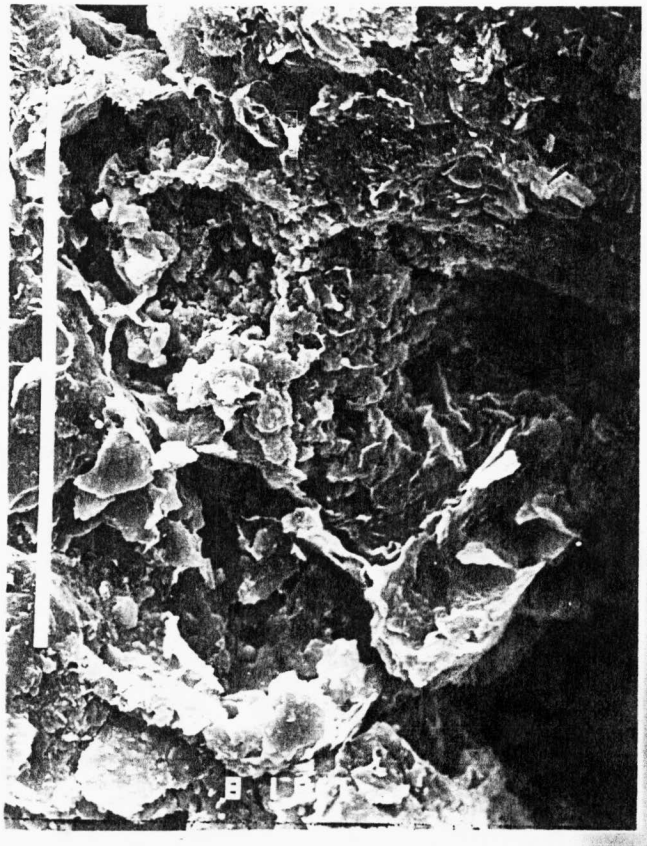
Photograph 8195 is a general view of the sample. Boxes labeled 1, 2, and 3 display the areas shown in high magnification photomicrographs (8196, 8197, and 8198).

Photograph 8195 is a low magnification survey view of the sample illustrating well developed primary intergranular porosity. Pores are large and well interconnected resulting in high formation permeability. The rock pore system is capable of yielding fluids to the wellbore if tested.

Photographs 8196, 8197, and 8198 are high magnification views of the sample displaying partial occlusion of intergranular porosity by authigenic clay cement. The clay cement consists of a mixture of illite and illite-smectite (I) as well as iron-rich chlorite (C). The clay cements have pore lining rather than pore filling morphologies. The clay cements loosely bind framework sand grains in the rock but have little effect in terms of reducing porosity or permeability.

*Bar scale refers to the length, in microns, of the bar scale on the left margin of each photograph. (1000 microns=1 mm)





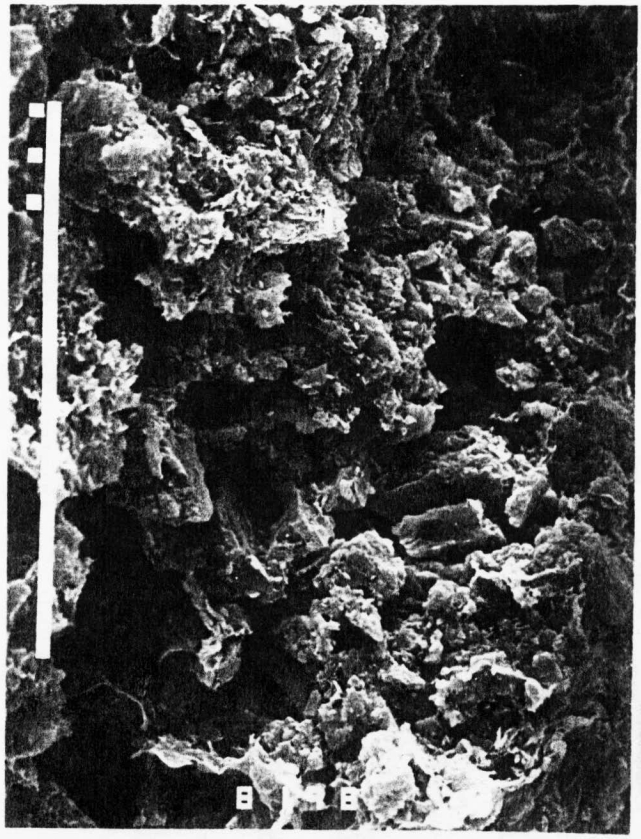


FIGURE 4

THIN SECTION PHOTOMICROGRAPHS

BLUE JACKET SANDSTONE

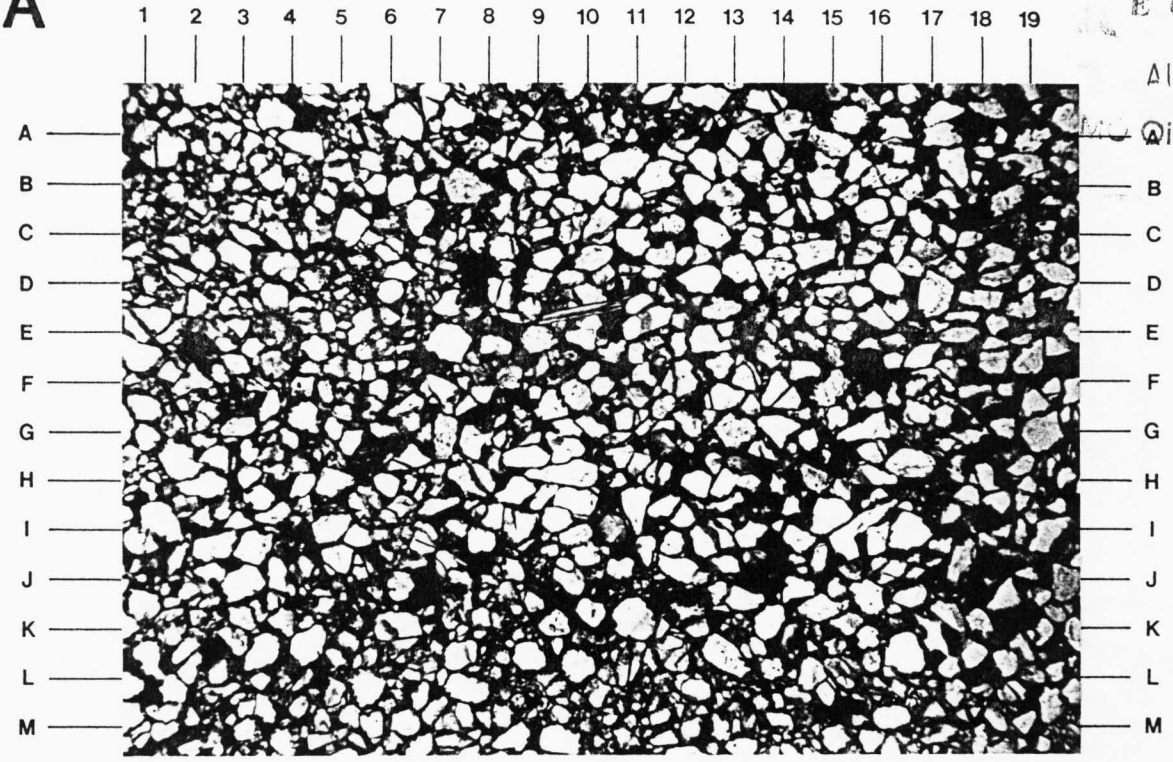
NO. 1 GLOVER FARMS WELL

Depth: 1402 Feet	Sample: D2444-002
Grain Size: 0.19 mm	Sorting: Well Sorted
Photograph Scale A = 0.50 mm	B = 0.125 mm

Color thin section photomicrographs on the facing page display a fine grained, well sorted sandstone sample from the 1402 foot interval in the well. The rock consists of angular to subangular grains of monocrystalline quartz (white, photo B, A-19, L-18), as well as smaller quantities of feldspar (photo B, F-9). Framework sand grains have a loose, open packing arrangement. The rock is poorly indurated and susceptible to mechanical failure if high differential pressures are drawn across the formation face. Intergranular porosity (blue) is well developed. Rocks with this type of pore system geometry are capable of yielding fluids to the wellbore at high rates of production.

Note: All thin sections have been impregnated with blue epoxy resin. In sandstones, the blue areas are pores. Each sample has been stained with Alizarin Red "S". Calcite is therefore red.

A



Scale

B

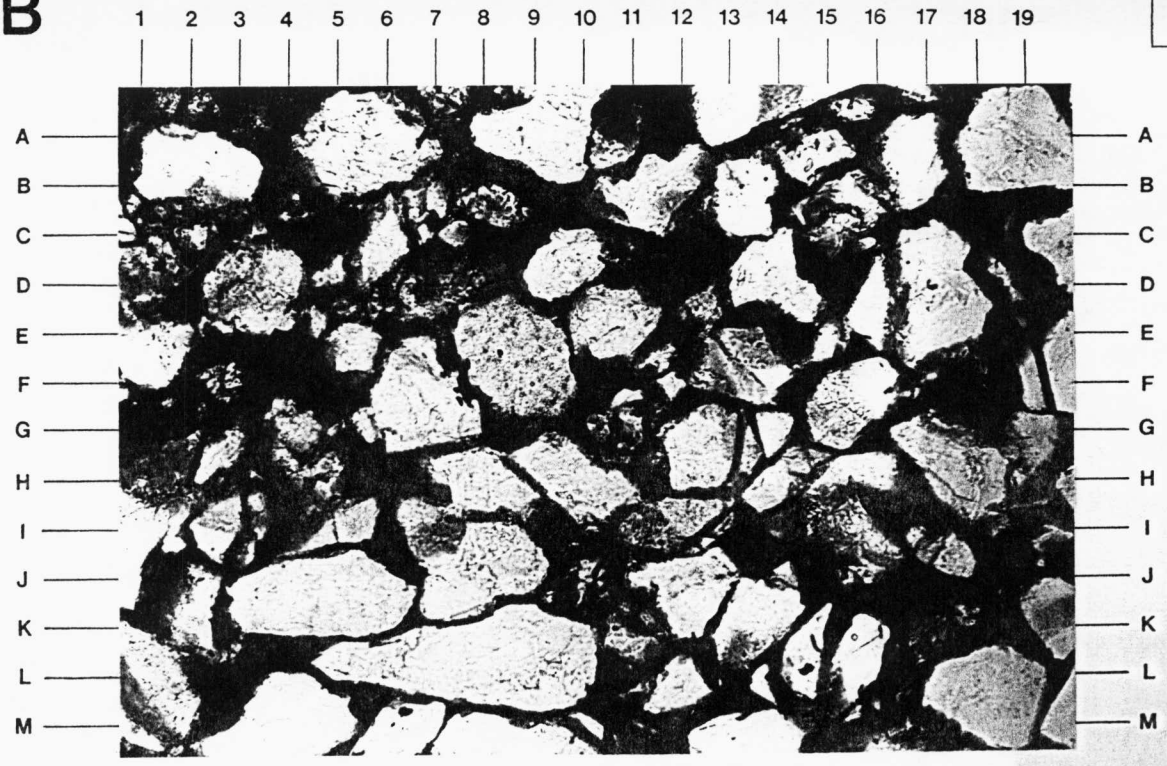


FIGURE 5

SCANNING ELECTRON MICROSCOPY

BLUE JACKET SANDSTONE

NO. 1 GLOVER FARMS WELL

1402 Feet

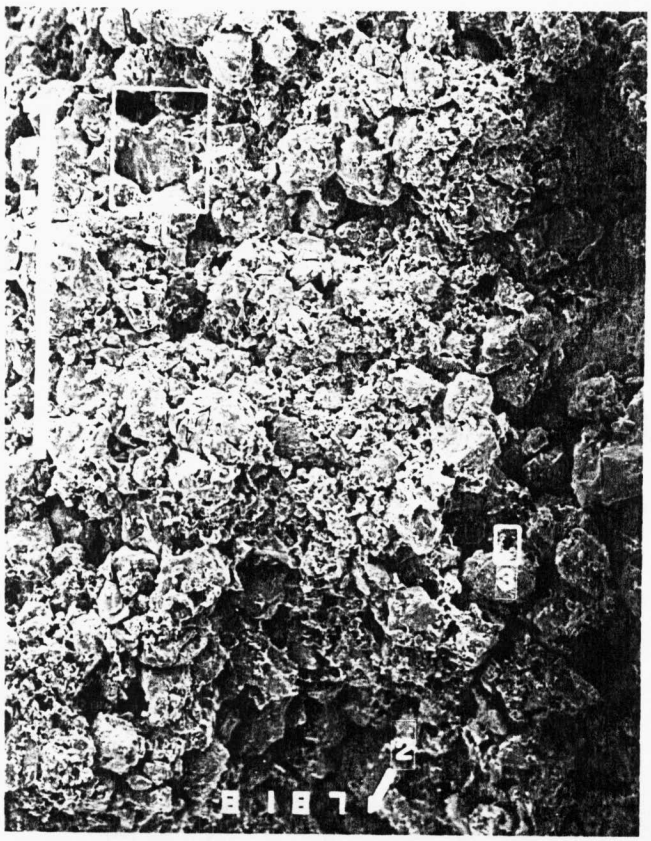
Photomicrograph	Bar Scale*	Magnification
8187	1000	45X
8188	100	300X
8189	100	450X
8190	10	1000X

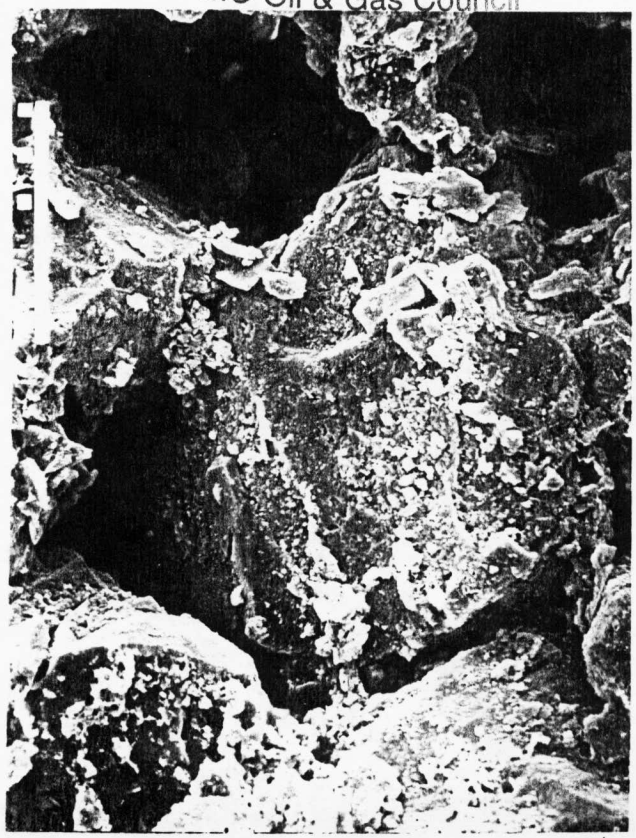
Photograph 8187 is a general view of the sample. Boxes labeled 1, 2, and 3 display the areas shown in high magnification photomicrographs (8188, 8189, and 8190).

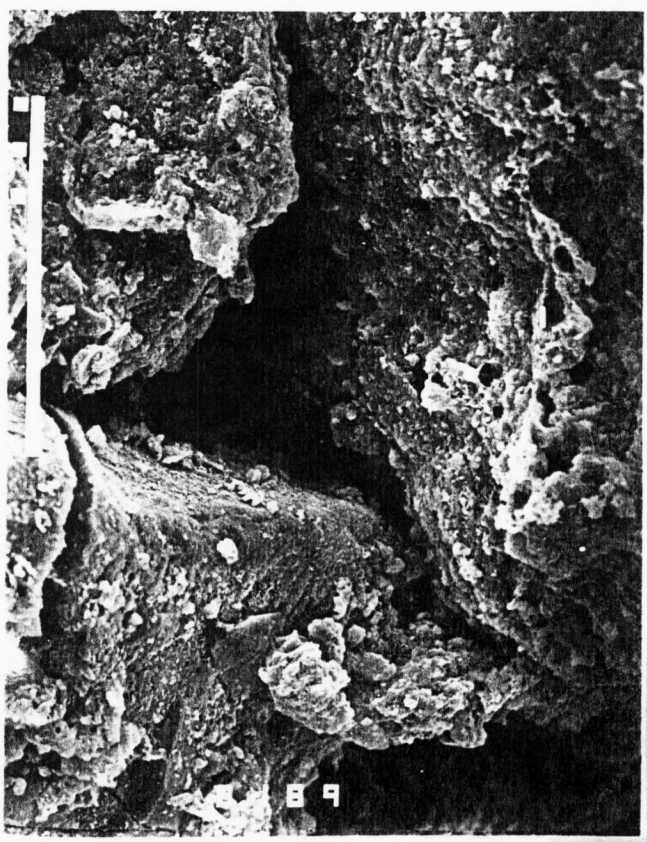
Scanning electron photomicrographs on the facing page display a fine grained, well sorted sandstone sample from the Blue Jacket reservoir zone in this well. The rock consists predominantly of loosely bound, angular to subangular grains of monocrystalline quartz with an open packing arrangement. The rock is poorly indurated and is susceptible to mechanical failure if high differential pressures are drawn across the formation face.

High magnification photomicrographs (8188, 8189, 8190) display the interiors of intergranular pores. Pores are large and well interconnected. Pore walls are lined by thin films of illite and illite-smectite (I) as well as iron-rich chlorite (C). Clay cementation is limited in the rock and has the effect of loosely binding framework sand grains. Clay cementation is of such limited extent that it has no significant effect in terms of limiting formation permeability or effective porosity.

*Bar scale refers to the length, in microns, of the bar scale on the left margin of each photograph. (1000 microns=1 mm)







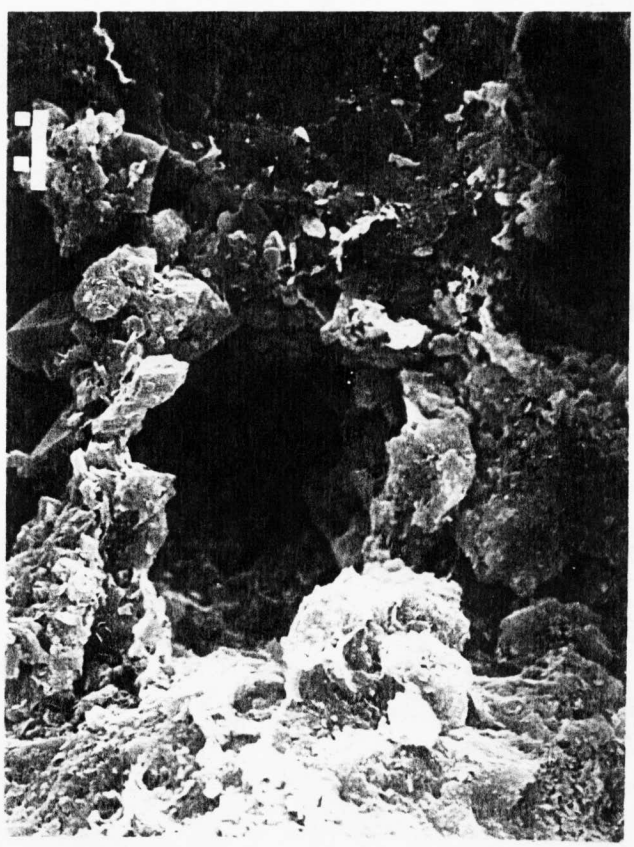


FIGURE 6

THIN SECTION PHOTOMICROGRAPHS

BLUE JACKET SANDSTONE

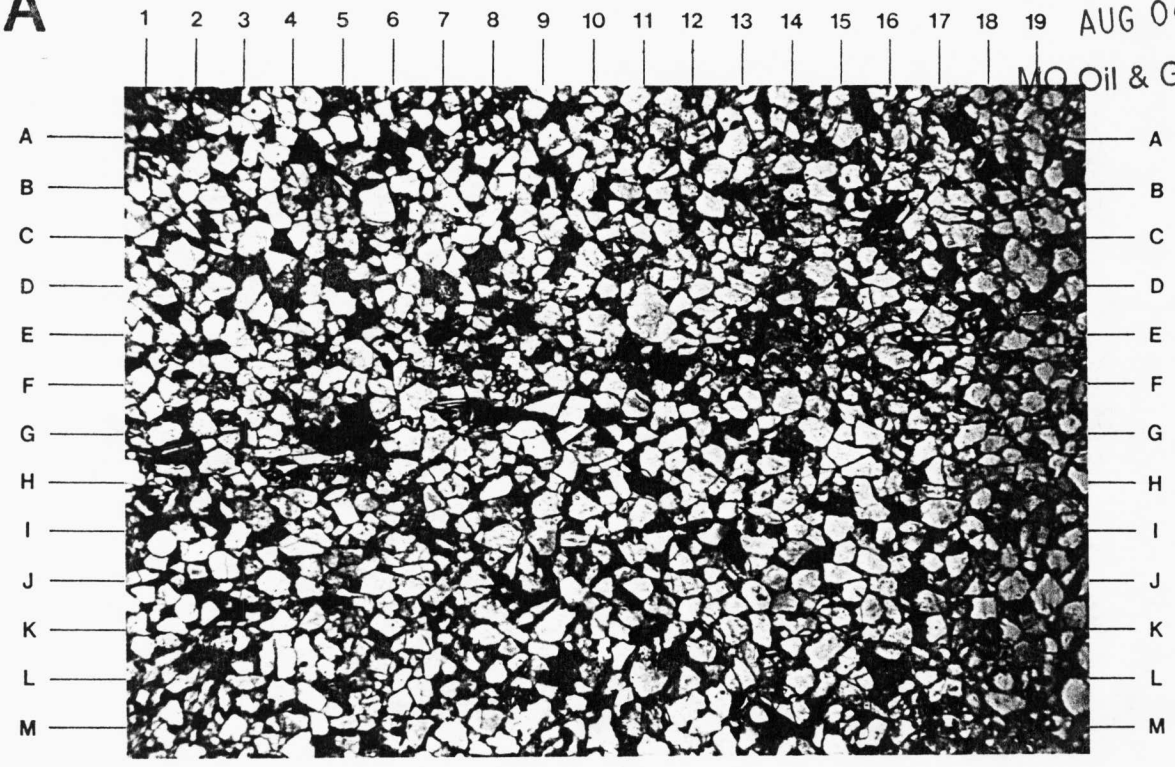
NO. 1 GLOVER FARMS WELL

Depth: 1405 Feet	Sample: D2444-003
Grain Size: 0.19 mm	Sorting: Well Sorted
Photograph Scale A = 0.50 mm	B = 0.125 mm

This sample is a fine grained, well sorted, quartzose sandstone. The rock consists predominantly of angular to subangular grains of monocrystalline quartz (white, photo B, K-13) as well as smaller quantities of feldspar (photo B, F-7). Framework sand grains have a loose, open packing arrangement. The rock is poorly indurated and is susceptible to mechanical failure if high differential pressures are drawn across the formation face. Gravel packing may be required for sand control. Intergranular porosity is well developed (blue). Pores and pore throats are partailly occluded by growths of authigenic clay cement (green rims on grains). Clay cementation is not extensive and has had little effect in inhibiting porosity or permeability.

Note: All thin sections have been impregnated with blue epoxy resin. In sandstones, the blue areas are pores. Each sample has been stained with Alizarin Red "S". Calcite is therefore red.

A



Scale

B

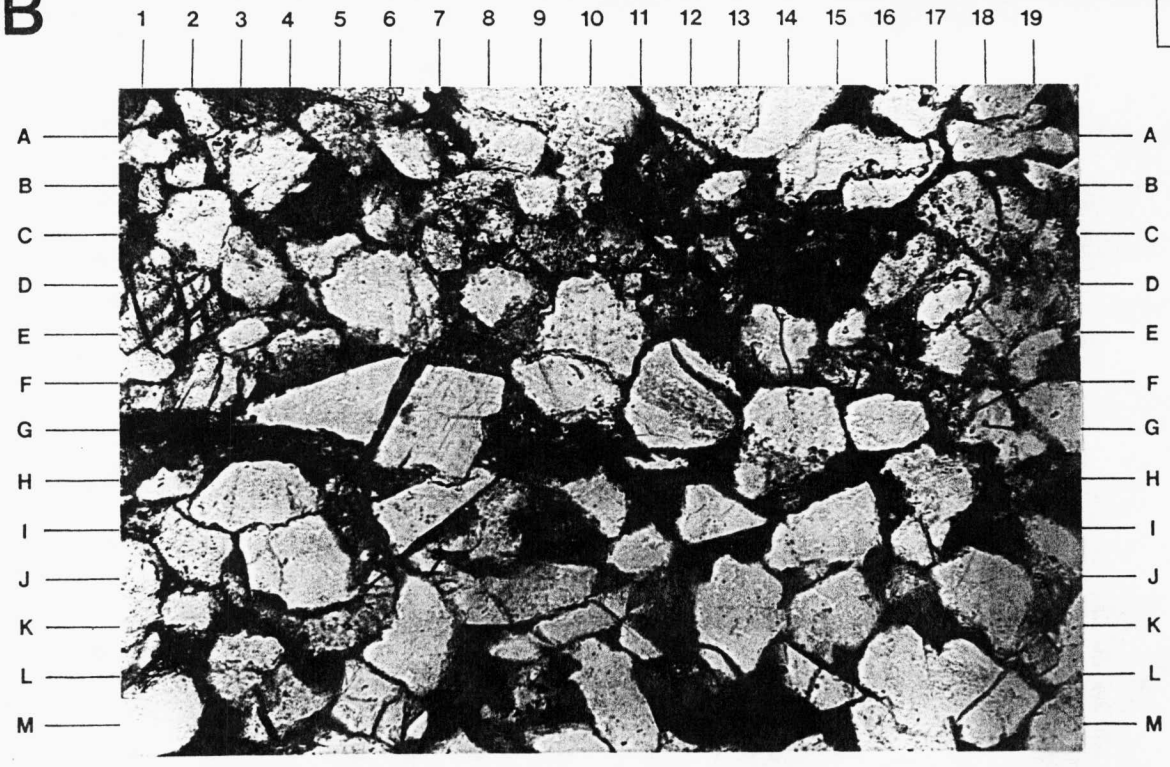


FIGURE 7

SCANNING ELECTRON MICROSCOPY

BLUE JACKET SANDSTONE

NO. 1 GLOVER FARMS WELL

1405 Feet

Photomicrograph	Bar Scale*	Magnification
8199	1000	45X
8300	100	700X
8301	10	1500X
8302	10	1500X

Photograph 8199 is a general view of the sample. Boxes labeled 1, 2, and 3 display the areas shown in high magnification photomicrographs (8300, 8301, and 8302).

This sandstone sample from the Blue Jacket reservoir zone is fine grained, well sorted, and characterized by well developed primary intergranular porosity. The rock is highly permeable and is capable of yielding fluids to the wellbore at high rates of production. The rock is poorly indurated and is susceptible to mechanical failure if high differential pressures are drawn across the formation face.

High magnification photomicrographs (8300, 8301, 8302) display the interiors of intergranular pores. Pores are relatively large and well interconnected. Pore walls are coated by thin films of clay cement. The clay cement consists of illite and illite-smectite (I) as well as iron-rich chlorite (C). A few scattered crystals of kaolinite (K) occur within the rock pore system.

*Bar scale refers to the length, in microns, of the bar scale on the left margin of each photograph. (1000 microns=1 mm)