





IV-35 (Rev 8-81)

1/*Commingled Test

State of Mest Nirginia

Bepartment of Mines Bil und Gas Bivision

Date_	Novemb	er 6	1985	
Operat	or's	,	1985	
	lo. KEM			
	George			
APT No	2. 47 -	107	- 1183	Fra

reverse side)

WELL OPERATOR'S REPORT

DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

LOCATION: Elevation: 642 Watershed No	orth Fork	of Lee Cr	eek		
District: Harris County Wood		Quadrangle	Lubeck		
<u> </u>					
					-
COMPANY Kaiser Exploration and Mining Company		1		Cement	1
ADDRESS P. O. Box 8, Ravenswood, WV 26164	Casing	Used in	Left	fill up	
DESIGNATED AGENT R. A. Pryce	Tubing	Drilling	in Well	Cu. ft.	4
ADDRESS P. O. Box 8, Ravenswood, WV 26164	Size				
SURFACE OWNER George Rhodes	20-16 Cond.				4
ADDRESS	10 3/4" XXXXX	252(KB)	252(KB	150 sks	वी
MINERAL RIGHTS OWNER Same	9 5/8				4
ADDRESS	8 5/8			65 sks 1	11/2
OIL AND GAS INSPECTOR FOR THIS WORK Glen	7	1768(KB)	1768(KB	100 sks	
Robinson ADDRESS Rt. 1, #6, Mineral Wells,	WV 1/2				
PERMIT ISSUED 11/4/81 Workers	4 1/2		4250(KB	225 sks	plo
DRILLING COMMENCED 11/11/81 \0/11/83	3				
DRILLING COMPLETED 11/17/81 \0/31/85	. 2				
IF APPLICABLE: PLUGGING OF DRY HOLE ON					\neg
CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED	Liners used		-		一
ON					_
GEOLOGICAL TARGET FORMATION Oriskany Sandston	ne	Der	oth 4170	fee	:t
	Rotary)	/ Cab:	le Tools		
Water strata depth: Freshfeet;		fee	t -		
Coal seam depths:		being mi	ned in th	e area? N	0_
Well plugged back to below formations:		ed on flu			
OPEN FLOW DATA Producing formation Devonian Shale	-	do	nth 2250	2520 for	a +
		ay zone de	<u> </u>		
Gas: Initial open flow Mcf/d		itial ope			
Final open flow Mcf/d		inal open		Bbl	/α
Time of open flow between init	tial and s	final test	.sn	ours	•
chatic male management on perglaritation	ce measure	ement) aft	er_48_hc	ours snut	ın
Static rock pressure 900 psig(surface					(KI
(If applicable due to multiple completion		av zone de	pth 1909.	<u>-1911</u> fe	
(If applicable due to multiple completion	· · · · · · · · · · · · · · · · · · ·				,,,,,
(If applicable due to multiple completion	Oil: I	nitial open		Bbl Bbl	

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

McCullough Services set Baker permanent bridge plug at 3660'; dumped 1 dump bailer of calseal on plug; perforated 3 holes in 4 1/2" casing at 1950'(KB) for squeeze;

10/30/85:

10/31/85:

of calseal on plug; perforated 3 holes in 4 1/2" casing at 1950'(KB) for squeeze; NOWSCO performed bullhead squeeze using 100 sks class A cement, to cement over Berea. McCullough perforated Brown Shale interval from 3359'-3539'(KB), 21 holes; and +(uso Berea Sandstone interval 1909'-1911' (KB), 9 holes; set Alpha frac plug at 2030(KB). NOWSCO foam fractured BEREA: used 500 gal 15% HCL acid, 45,000# 20/40 sand, 15,000# 10/20 sand, 619,500 scf of nitrogen, 305 bbl total water; 1500 psig breakdown; avg and maximum treating pressure was 1630 psig; ISIP: 1300 psig. NOWSCO foam fractured BROWN SHALE: used 500 gal 15% HCL acid, 60,000# 20/40 sand, 562,800 scf nitrogen, 262 bbl of water; 2220 psig breakdown; 2100 avg treating pressure; 1360 psig ISIP.

FORMATION COLOR HARD OR SOFT	· ·	ELL LOG BOTTOM FEET	REMARKS Including indication of all fresh and salt water, coal, oil and gas
			and sait water, con, bir and ju
SAME AS PREVIOUSLY SUBMITTED			
	· · · · · · · · · · · · · · · · · · ·		
	;		·,.
•			
	:		
$\label{eq:continuous} \mathbf{x}_{i} - \mathbf{x}_{i} \leq \mathbf{x}_{i} + \mathbf{x}_$			
	l	i	

(Attach separate sheets as necessary)

KAISER EXPLORATION AND	MINING	COMPANY
Well Operator		
By: RAP		
By: RA		
Date: November 6, 1985		

Regulation 2.02(i) provides as follows: Note: "The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including wall, encountered in the drilling of a well."

Statte rock procaure, _____ pulg (surface measurement) hitson ____ hour ober to

FORM TV-30 (Reverse)

[68-78]

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

Basin Surveys perforated Oriskany Sandstone 4170-4174(KB) and 4178-4184(KB);

11/24/81:

4 holes/ft, 40 holes; 3½" glass jets on strip.
Halliburton and BJ Hughes hydrofractured Oriskany w/15,000# 80/100 sand; 45,000#
20/40 sand; 500 gal. 28% HCL Acid; 142,000 SCF of nitrogen; 800 BBL water;
37 BPM avg. rate; 2000 psig avg. treating pressure; breakdown was 2600 psig;

Instantaneous shut in pressure was 1100 psig.

WELL LOG

					Remarks
		1		Bottom	Including indication of all
FORMATION	Color	Hard or Saft	Top Feet	Peet	and sait water, coal, cil ar
Soil & Shale			0	60	
Sand			60	88	
Shale			88	150	<u> </u>
Sand			150	170	
Shale & Sand			170	245	
Shale			245	332	
Sand			332	342	
Shale			342	374	
Sand		1	374	424	•
Shale & Siltstone			424	852	
Sand			852	864	
Shale		ł	864	883	•
Sand			883	924	
Shale		1	924	994	
Sand'		}	994	1006	·
Shale		l	1006	1041	·
Sand			1041	1050	
Shale		Ì	1050	1096	
Sand			1096	1120	
Shale & Siltstone			1120	1262	
Sand			1262	1280	
Shale			1280	1394	
Salt Sand			1394	1508	
Shale .			1508	1880	
Coffee Shale (Sunbury)			1880	1900	
Berea Sand			1900	1903	Gas show @ 1901 ,
Shale		1	1903	3042	Gas show @ 1974, 2160, 2
Sila l'E	1	1	1 1903	3072	2400, 2492, 2670, 27
Brown Shale			3042	3540	Gas show @ 3512
Shale		1	3540	3871	Gas show @ 3692
Marcellus Shale		1	3871	4078	Gas show @ 3905, 3945
Onondaga Lime			4078	4166	Gas show @ 4150
Oriskany Sand		1	4166	4206	Gas show @ 4166, 4180
Helderberg Lime			4206	4304	443 Show C 11009 1100
Tierder berg Erine					1
Total Depth		1	4304		
		1		1	•
	Ī		1	1	1

(Attach separate sheets to complete as necessary)

	11 Operator	
By _	R.A. P-	
[ts	General Manager	

VALCED EVELODATION AND MINING COMPANY

Regulation 2.02(i) provides as X. TE: jolious:

"The term 'log' or 'well log' shall mean a systematic, detailed geologial record of all formations, including oral, encountered in the drilling of a well."

DEPARTMENT OF MINES



Oil and Gas Division

MOV - 2 1981

OIL AND GAS DIVISION WY DEPARTMENT OF MINISON

"OIL AND GAS WELL PERMIT APPLICATION

Charleston, W. Va.	
	DATE October 27, 1981
Surface Owner George Rhodes	Company Kaiser Exploration and Mining Compa
Address Rt. 1, Box 149, New England	Address P O Box 8, Ravenswood, WV 26164
Mineral Owner Same	Farm George Rhodes Acres 199.25
Address	Location (waters) North Fork of Lee Creek
Cost Owner Same	Well No KEM #135 Elevation 642'
Address	m Hannic
Coal Operator None	Quadranda Libeck
Address	
THIS PERMIT MUST BE POSTED AT THE WELL SITE.	
All provinces being in asserdance with Chapter 22,	
of the W. Va. Code, the location is hereby approved	
for drilling. This permit shall expire if	INSPECTOR
operations have not commenced by 7-4-82	TO BE NOTIFIED Deo Mace
	ADDRESS Rt. 1, Box 65, Sandridge, WV
Deputy Director - Oil & Gas Division	
	PHONE 655-8693
entlemen:	
The undersigned well operator is entitled to drill upon	the above named farm or tract of land for oil and gas, having for
e thereto, (or as the case may be) under grant or lear Royal Resources Corp. Rhodes made to Exploration & Mining	use dated May 22.
	TageUL
X NEW WELLDRILL DEEPER	REDRILLFRACTURE OR STIMULATE
OIL AND GAS WELL ORIGINALLY DRILL	LED REFORE HAVE 5
The englored miss and	
e been notified as of the above date.	er or licensed land surveyor and all coal owners and/or operators
The above named coal compare and/or and	and another operators
nake by Section 3 of the Code, must be received by, or	by notified that any objection they wish to make, or are required in filed with the Department of Mines within ten (10) days.
copies of this notice and the enclosed plat	days. 4
coal owners at their above shown respective address e day with the mailing or delivery of this copy to the N	by registered mail, or delivered to the above named coal operators
e day with the mailing or delivery of this copy to the I	Department of Mines at Charleston, West Virginia.
ASE SUBMIT COPIES OF ALL	Very truly yours
PHYSICAL LOGS DIRECTLY TO:	(Sign Name)
	Well Company
T VIRGINIA GEOLOGICAL AND NOMIC SURVEY	Kaiser Exploration and Mining Company P. O. Box 8
D. BOX 879 of	TEBS Street
GANTOWN, WEST VIRGINIA 26505 Well Open	
304 - 292-6331	City or Town
9 9	West Virginia 26164
	State

*SECTION If no objections are filed or found by the Department of mines, within said period of ten days from the receipt of and plat by the department of mines, to said proposed location, the department shall forthwith issue to the well operator a permit reciting the well operator sufformed to proceed.

47-107-1183

PROPOSED WORK ORDER TO	YDRILL	DEEPEN	FRA	CTURE-STIMULA	TE		
DRILLING CONTRACTOR: (If	**	RESPONSIBLE AGENT: NAME Robert A. Pryce					
•	•						
ADDRESS P. O. Box 388, ET				, Ravenswood,	WV 2616		
TELEPHONE 273-5371	· N. I. C. II	_ TELEPHONE _			NY 2010		
•	12201				•		
ESTIMATED DEPTH OF COMPL		_ ROTARY^	C	ABLE TOOLS			
PROPOSED GEOLOGICAL FORM		•	•				
TYPE OF WELL: OIL_	GAS_ <u>X</u>	COMB.	TORAGE _	DISPOSA	L		
•	RECYC	LING WA	TER FLOOI	OTHE	R		
	•			•			
TENTATIVE CASING PROGRAM	A:	•					
CASING AND TUDING		•			. *		
CASING AND TUBING SIZE	USED FOR DRILLING	LIET IN WELL		CEMENT FILL OR SACKS - CU			
20 - 16							
13 - 10					•		
9-5/8 10 3/4"	250!	250'	. 79	00 sks class A			
8 - 5/8							
7	1912'	1912'	. 6	55 sks 50/50 po	zmix		
5 %			10	00 sks class A			
4 %	4320'	4320'	22	25 sks 50/50 po	zmix		
3				Perf. Top			
2				Perf. Bottom			
Liners				Perf. Top	· · · · · · · · · · · · · · · · · · ·		
				Perf. Bottom			
APPROXIMATE FRESH WATER	DEPTHSFEET	SALT SALT	WATER	FEET_			
SUBMIT FIVE (5) COPIES OF PLAT.		I Da, I Ditt Oith	ANOE DOM	·	avi Cori		
FUBMIT FIVE (5) COPIES OF WELLS DRILLED PRIOR T	OF OG - 1, SHOWING ORIG	GINAL PERMIT NUM COPY OF THE PLAT	BER AND P	ERFORMANCE B ORIGINAL WELI	OND. ON		
MUST ALSO BE SUBMITTE	D.		٤.				
70 FRACTURE - STIMULATE:				. · · · · · · · · · · · · · · · · · · ·	•		
OIL AND/OR GAS WELL OR BOND, PERMANENT PLAT	RIGINALLY DRILLED BEF AND ORIGINAL WELL RI	ORE JUNE 5, 1929, F	IVE (5) COP	ies oc - 1, perf	DRMANCE		
OIL AND/OR GAS WELL OR	LIGINALLY DRILLED ON A	and/or after jûn	E 5, 1929, 1	FIVE COPIES OG -	1, SHOW-		
ING ORIGINAL PERMIT NUM	MBER, AND PERFORMANC	E BOND.		igen en e			
Required forms must be filed	within ninety (90) days of	completion for bond	reiesse. Ins	pector to be notifi	ed twenty-		
four (24) hours in advance.		•					
	•						
				titika talaan ka ta'a aytiin sart	. T. I MICHIGANIAN C.		
		:		•			
The following waiver must be thereof.	e completed by the coal of	perator if the permit	is to be issue	ed within ten days	of receipt		
WEIVED: I the understand A	4 6		_				
WAIVER: I the undersigned, Agen	d and nice on a	Coal Company	y, Owner or	Operator of the	coal under		
	d and place on our mine r			-			
We the	Coal Company	have no objections t	o said well l	being drilled at thi	s location,		
	omplied with all rules and re	gulations in Articles 4	5, and 7, C	hapter 22 of the We	est Virginia		
Code.	هي	•					
•			•				
		•	For C	oal Company			
			1017				
				* **			
		-	Of	licul Title			
$(\omega_{ij})^{-1} = (\omega_{ij})^{-1} = (\omega_{ij})^{-1$		C C C C C C C C C C C C C C C C C C C	OI	ficial Title			

FORM WW-2(B) (Obverse) 7/85





1) Date: Aug	ust	14		, 85	•
2) Operator's Well No					ω
3) API Well No.			107	1183	Frac
•	State		County	Permi	-

DIVING A STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY, OIL AND GAS DIVISION

^					Al	PPLICATIO	N FOR A WEL	L WORK PERMIT		
4)	WELL TY	PE: A O	il	/ G	as X					
٠,		B (1	f "Gas", I	Production	n	<u> </u>	Underground s	torage	/ Deep	\angle Shallow \underline{X}
5)	LOCATIO	N: Ele	vation:	6421			Watershed:		of Lee Creek	
		Dis	E Xplo	iarris ation	and	Mining:	County: W	ood	Quadrangle:	Lubeck
6)	WELL OP		P. 0.	BOY 8	onibar	TA CODE:	465		Same	Pryce
	Address		Ravens		WV	26164		Address	Jame	
8)	OIL & GA	SINSPEC						9) DRILLING CO	ONTRACTOR:	
-,	Name		Robinso	on				Name Kais	er Exploration	on and Mining Company
	Address					<u>asant Es</u>	<u>stat</u> e	Address	P. O. Box 8	
		Mine	eral We	ells,	<u> </u>	26150			Ravenswood.	WV 26164
10)	PROPOSE	D WELL	WORK:	Drill		_/ Drill			/ Stimulate	
				Plug of	ff old f	formation	/ Perfor	ate new formation	Set po	ermanent bridge plug on top of plug; frac
				Other p	hysical	change in w Rown Sk	vell (specify)	451 Brown	Shale sque	eze 4 1/2" casing ove
11)	GEOLOGI 12) Estima						feet		i onaic, sque	· · · · · · · · · · · · · · · ·
	12) Esuma 13) Appro									
								,	area? Yes	/ No X
15)	CASING A		_							
	ASING OR	l	SPEC	IFICATION	s	11	FOOTAGE I	NTERVALS	CEMENT FILL-UP	PACKERS
п	UBING TYPE	. Stze	Grade	Weight per ft.	New	Used	For drilling	Left in well	OR SACKS (Cabic feet)	
Con	ductor	 		ļ	ļ	<u> </u>				Kinds
Free	sh water	10 3/4	 "		ļ		2521	252'	150 sks cla	s A
Coa		 	 		 		17601	17.001	65 sks pozm	x, 100 sks Class A
	rmediate	7"	ļ	 	 	 -	1768' 4250'	1768' 4250'	H	
Tub	duction	4 1/	1	 	1		4230	4/30	225 sks pozr	Paptins set
Line										Perforations:
										Top Bottom
					<u> </u>					
			1	<u> </u>	<u> </u>			L		
						0	FFICE USE (ONI V		
					۱ [RILLING PE			
				C	N				_	
Per	mit number_	47	-107-1	183 Fr	ac				S Dat	eptember 3 19 85
Thi	s nermit cove	ring the w	ell operate	or and we	ll locati	on shown be	elow is evidence	of nermission grant	ed to drill in accordan	ce with the pertinent legal re-
qui	rements subje	ect to the c	onditions	contained	herein	and on the r	everse hereof No	lification must be gi	ven to the District Oil	and Gas Inspector, (Refer to tractor shall notify the proper
io. dist	8) Prior to the	e construc	tion of ros	ids, locati s before a	ons and	pits for any	permitted work. k has commence	In addition, the w	ell operator or his con	tractor shall notify the proper
	_	-			-				o any modifications as	nd conditions specified on the
	erse hereof.	OI K 15 25 U	escribed ii	i the Noti	ce and A	ъррисацоп,	piat, and reciam	ation plan, subject t	o any mounications a	nd conditions specified on the
Per	mit expires _	Se	ptemb e	r 3, 1	987		unless well	work is commenced	l prior to that date and	prosecuted with due diligence.
_				r						
	Bond:	Agent	: F	lat:	Casi	ing _Fe	e WPCP	S&E	Other	•
		h	B 1	~ 1	m	X/ 969	001			•
L		01	11/		'')	1~ H69	000		1	
								K	_)-/w/w	X
NO	TE: Keep o	one copy o	f this perm	nit posted	at the c	irilling locat	ion. D	irector Div	ision of Oil	and Gas
							D.			and Gas File