GLD1068

Haskins · Pfeiffer Inc.

International Geophysical Consultants

1449 Denver Club Building Denver, Colorado 80202 (303) 573-8958



October 7, 1980

Southland Royalty Company 1000 Fort Worth Club Tower Fort Worth, Texas 76102 Attn: Mr. Jere Denton

> RE: Dixie Valley Area Churchhill & Pershing Counties, Nevada

Dear Mr. Denton:

Seismic data for the Dixie Valley Prospect Area were acquired by Petroleum Geophysical Co. party No. 302. The data were recorded in SEG-B format by Texas Instrument's DFS-5 amplifiers. An 8-128Hz filter was used on recording at a sample rate of 2 ms.

Energy source consisted of four Mertz-11 vibrators equipped with Pelten Electronics Advance 1 Model 4 instruments. Sixteen sweeps were used per V.P. with sweep pilot of 12-60Hz. V.P. interval was 220 feet with a group interval of 110 feet. Stack is 2400% from 96 trace instruments with a spread geometry 5280'-440'-0'-440'-5280'.

Data processing was performed by Western Geophysical Co. Complex and rapidly changing geologic environment introduced difficult velocity and stacking problems. These problems were resolved by Western's diligence in the analysis of the stacking velocities and design of deconvolution parameters to equalize the frequency spectrum to attenuate short period multiples. Since the dips in the area were generally less than 20 degrees, "Finite Difference" digital migration was used to collapse diffractions generated by faulting and to place reflected energy in the true time domain position.

It should be noted that any additional shooting in the area will be more effective from the standpoint of migration techniques if line orientation is designed normal to the strike shown by existing control.

From available control, three maps have been constructed. These are :

1) Migrated Producing Aquifer

2) Migrated Pluton

3) Non-Migrated Shallowest Flow

Southland Royalty Company Page 2 October 7, 1980

Identification is from a synthetic seismogram constructed using the sonic log of the Thermal Power; Dixie Fed. 66-21 in Twp. 24N, Rge. 36E, Sec. 21, or by geologic definition of the mapped event. A discussion of the maps submitted follows:

MIGRATED PRODUCING AQUIFER

The event identified as the producing aquifer in the Thermal Power Well Dixie Fed. 66-21 is coincident with a high amplitude event generated on the synthetic seismogram from that well. A reasonable correlation exists between the synthetic and the recorded seismic data at the well. This event, in its migrated position is the basis for the map under discussion.

Because the seismic lines cross from the sedimentary basin to positions overlying the pluton, interruptions occur in the continuity of data from the aquifer. In such cases it becomes necessary to re-establish continuity through correlation across the data gaps.

The overall configuration of the event mapped indicates the Thermal Power well encountered the aquifer in an overthrust block off the forefront of the pluton. The aquifer terminates both against the pluton and basinward. A series of events with character similar to the aquifer can be noted on the sections. Because of the limited areal extent of the individual events, the map has been constructed using the event with characteristic response in the nearest equivalent stratigraphic position. Termination of events is marked by hatchers.

MIGRATED PLUTON

The purpose of this map is to show the configuration of the forefront of the pluton so that the contact between the aquifer and the pluton can be viewed in perspective. The criteria used for defining the forefront is the zone of termination of coherent energy.

NON-MIGRATED SHALLOWEST FLOW

Since no appreciable geothermal gradient is indicated in the Thermal Power well, it is possible that any potential aquifer would be suitable for production without regard to depth of burial. This map is constructed to show the shallowest position at which an event with character similar to the identified aquifer, could be expected.

Southland Royalty Company Page 2 October 7, 1980

RECOMMENDATIONS

At this stage of exploration, plans should be made to increase the density of seismic control in the areas available for drilling. This additional control should use parameters compatible with the existing data. Care should be taken to keep all new lines normal to strike to aid migration. Processing should be carefully supervised so that data quality will be compatible with that now at hand.

Yours truly,

Haskins-Pfeiffer, Inc.

William Q. Haskins

WJH/1f

	R - 36 - E							20	7 - E	- E		
									į			
T 25 N	30	29	28	27 PERSHING CHURCHILL		25	30	29	28 ′	27 ₁₀₀ . 5,	7.H	T 25 N
	31	32	33	34	35	36	31	32 h		1n 34	35	
-	6	5	4	3	2	-	6	. in 5	The state of the s	3	2	
T 24- N	7	8	9	10	11	12	7 SUMEDOO		100 17	ica	11	
	18	17	Interface Bet	ween Aquifer	and Plut	147 . 14 (14) s. 114	O O O	100	NOTE: TERMINATION	OF EVENTS	14	
	19	20	1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	27 27 21 Mar	non non	24	19	20	21	22	23	7 24 N
	30	29 27	28	27	26	25	30	29	28	DIXIE	Southland Royalty C	ISMIC
	31	32	33	34	35	36	31	32	33	CHURCHILL	A PERSHING COUNTIE NON-MIGRATED ALLOWEST FLOV WHATH J. HEARTH BERNEY, COFFEE BY: Petrolum County BY: Petrolu	S, NEVADA . W" . Inc
		· · · · · · · · · · · · · · · · · · ·	R - 3	66 - E				R - 37 - I	E	2000 0	SCALE IN FEET	000 8000

i]	R - 3	36 - E		1	R - 37 - E .					1
										**	23	
T 25 N	30	29	28	PERSHING CHURCHILL	<u>co.</u>	25	30	29	28	27,477	1.N =1.500 ²⁶	T 25 N
	31	32	33	34	35	36	31	32			35	
	6	5	4	3	2	1	6		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1,800		
	7	8	9	10	II	12	SUNFOCO		7.1802 7.1802 7.1803	110 110 110 110 110 110 110 110 110 110	1 300	
T 24-	18	17	16	15	1000		(a) (a) (b)	17	7 / 10	15	. 14	
N 	19	.500 -20	150 M 2 M 2 M 2 M 2 M 2 M 2 M 2 M 2 M 2 M	THE LEE LEE		7	1500	20	08;7 21 70E;7	22	23	7 24 N
	30	1.000	28	27	26	25	30	29	28	DIXIE	OUTHLAND ROYALTY CONTERNAL RESOURCES E	ISMIC
	31	32	33	34	35	36	31	32	33	Interpretation Acquisition & Processing B	Haskins - Pfeitle Denver, Golorado Iy: Petraleum Geoph Iy: Western Geophy:	6 Ir Inc Iyalcal Co. Ircal Co
			R - 3	86 - E		l		R - 37 - F	,l 	2000 0 RHOH	2000 4000 6 SCALE IN FEET	000 8000 L

.

			R - 3	36 - E		1		23	1			
T 25 N	30	- 29	28	27	26	25	30	29	28	22 /29	. _t .n 1.200	т 25
				PERSHING CHURCHILL	<u>co.</u>						1300	N
	31	32	33	34	35	36	31	32	1,00) L	35	
	6	5	4	3	2		6	, 5 to 5	THE	1,500 3	2	
_	7	8	9	-10	II NOT TERM	TE: 12	NTS Junetoco	Jun .	3	10	II	
T 24 N	18	17	16	15	300	134 4		17 18 10 10 10 10 10 10 10 10 10 10 10 10 10	16	15	; 14	T
N _	19	20	500	27 27	20 20 20 20 20 20 20 20 20 20 20 20 20 2	24	19	20	21	22	23	-24 N
_	30	1.5	28	27	26	25	30	29	. 28	DIXIE	Outhland Royalty C NATURAL RESOURCE A VALLEY SE PERSHING COUNTIE	ISMIC
	31	32	33	34	35	36	31	32	33	Interpretation Acquisition Processing I	Hashins - Pteiffe Denver, Calorade By: Petroleum Geoph By: Western Geophyi	s v Inc ysical Co ical Co
			R - 3	36 - E		l		R - 37 - F	2 ¹	3000 0	SCALE IN FEET	000 4000

		R - 3	6 - E		1						
							20	R - 3	22	23	
T 25 30 N	29	28	27 PERSHING CHURCHILL	<u>co.</u>	25	30	29	28	27 . 50	7 th 26	T 25 N
31	32	. 33	34	35	36	31	32	. 433 . h	34	35	
6	5	4	3	2	1	6	. 13. 5 . 13. 5	50. 10. 4. 50.	3	2	
7	8	9	10	11	12	7 . SUNEDCO	8	b. 9	10 10	11	
Ţ 24 N	17	16	. 15	orsité si fi di	* . *	92 ^{®1} ®3 ®4	17 • 4 <u>sr</u> /-5	16	15	14	
N 19	20	21 DF-66-21m⊕m	22	. 23	24	19	20	21	22	23	7 24 N
30	29 . 6	28	27 _	26	25	30	29	28	DIXIE	Outhland Royalty Co	SMIC
31•	32	. 33	34	35	36	31	32	33	Local Interpretable Acquisition Processing	TION MAP William J. Haskins Haskins - Pfeiffer Denver, Colorade By: Petroleum Geophysi By: Western Geophysi	g inc. sical Ce. cal Ge.
		R • 3	6 - E	 	1		R - 37 - F	<u> </u>	2000 0	SCALE IN FEET	00 8000