CHAROLETTE STATE UNIT

Chaves County, New Mexico

GEOLOGICAL REPORT

May 20, 1991

CHAROLETTE STATE UNIT

Chaves County, New Mexico

GEOLOGICAL REPORT

May 20, 1991

George R. Reddy

Consulting Geologist
Bus. (505) 623-6233
Res. (505) 623-3767

200 W. 1st St.
P. O. Box 778
Roswell, NM 88202-0778

May 20, 1991

CHAROLETTE STATE UNIT
Chaves County, New Mexico

GEOLOGY

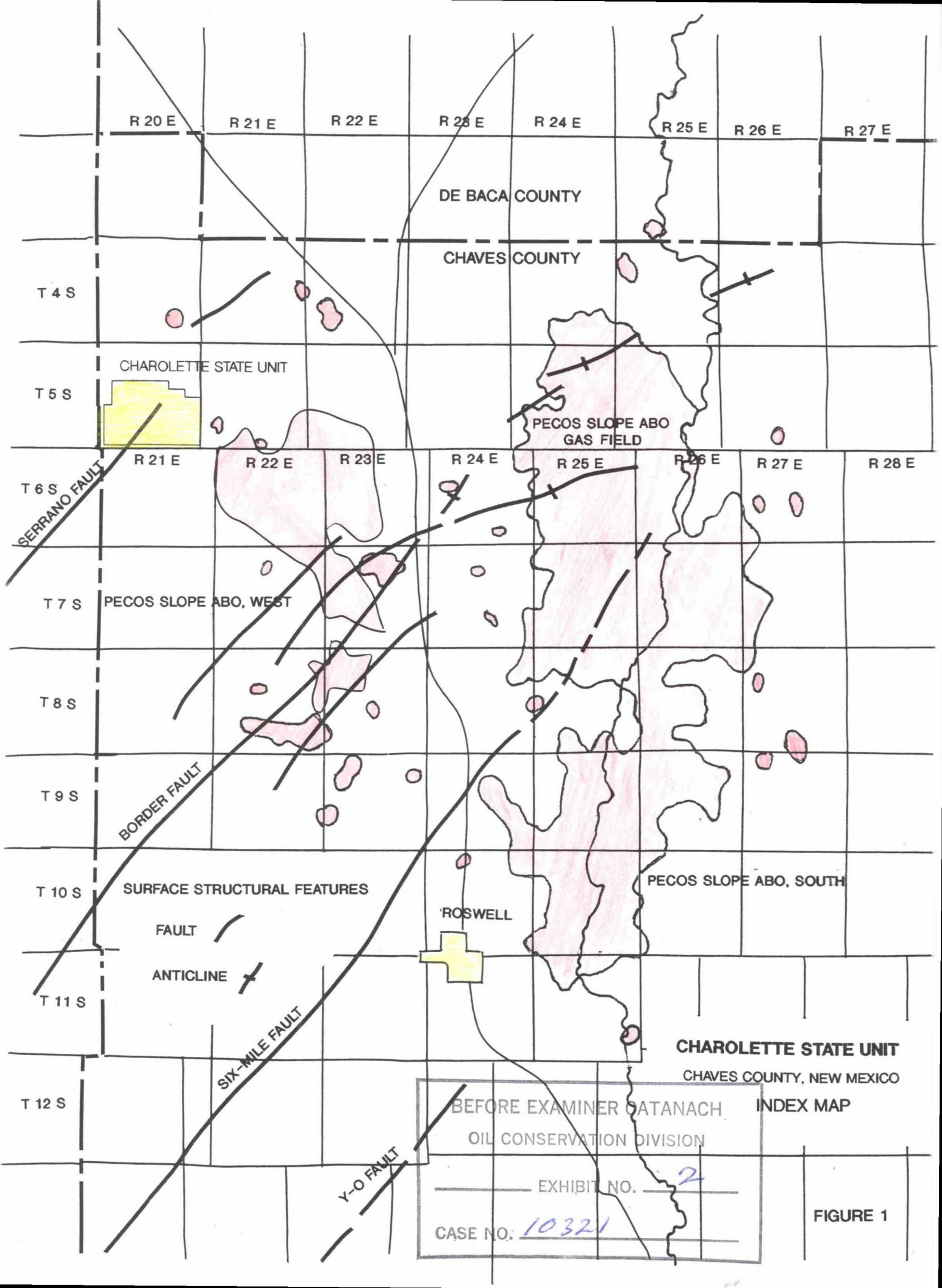
The Charolette State Unit comprises a total of 13,946.73 acres in portions of Township 5 South, Range 20 East, in the northwestern corner of Chaves County, New Mexico, approximately 37 miles northwest of the city of Roswell (figure 1). The unit lies northwest of and outside the currently established limits of the West Pecos Slope Abo gas field in a sparsely-drilled area.

STRUCTURE: Structure has been mapped at top of Abo formation (figure 2). It indicates regional east-southeast dip of approximately 60 feet per mile within the unit area.

Some of the surface features mapped by Kelley (1971) extend into the area (figures 1 and 2). These are the linear faults and folds which he termed "buckles" and described as basement strike-slip, right-lateral faults. The Six-Mile and Border buckles each extend northeastward through the Pecos Slope and West Pecos Slope fields respectively and have had influence on local structure there. In addition to local structural disturbance along these features the distribution of Pecos Slope sandstones in the vicinity of the buckles suggests that their topography locally influenced depositional strike of the reservoirs from predominantly southeast to southwest.

The Serrano buckle is less discernible in the Charolette unit area than it is to the southwest and north of the unit, and is not reflected by the structural contours of figure 2. Where it is recognizable at the surface by satellite and aerial photography southwest of the Charolette unit it is narrow and would probably not show significant effects on subsurface structures in areas with few data points such as in the unit area. Although only indirect evidence suggests that the Serrano buckle extends into the Charolette unit area, its presence there would have been a probable influence on Abo sandstone deposition and subsequent movement along the fault would lead to fracture enhancement of porosity and permeability of Pecos Slope reservoirs.

PECOS SLOPE FACIES OF THE UPPER ABO FORMATION: Primary objectives are the very fine-grained sandstones of the upper Abo formation referred to on the sandstone isopach map as the "Pecos Slope Facies" (figure 2). They are the reservoirs represented in the upper 240 feet of the Abo formation on the example log of the type


R 20 E
R 21 E
R 22 E
R 23 E
R 24 E
R 25 E
R 26 E
R 27 E
R 28 E
DE BACA COUNTY
CHAVES COUNTY
T 4 S
T 5 S
T 6 S
T 7 S
T 8 S
T 9 S
T 10 S
T 11 S
T 12 S
CHAROLETTE STATE UNIT
PECOS SLOPE ABO GAS FIELD
PECOS SLOPE ABO, WEST
PECOS SLOPE ABO, SOUTH
SERRANO FAULT
BORDER FAULT
SIX-MILE FAULT
Y-O FAULT
ROSWELL
SURFACE STRUCTURAL FEATURES
FAULT
ANTICLINE
CHAROLETTE STATE UNIT
CHAVES COUNTY, NEW MEXICO
INDEX MAP
BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. 2
CASE NO. 10321
FIGURE 1

well (figure 3). Braided stream channels and meanders are reflected in isopach maps of the Pecos Slope reservoirs in the fields to the east and southeast of the proposed unit. The sands were deposited in a southeasterly-trending fluvial system that produced a delta complex on the Northwest shelf during Leonard time. The Charolette unit was located in the adjoining flood plain or near the inland margins of the delta.

Absence of well control prohibits defining discreet hydrocarbon traps in the unit area. However, the depositional environment was favorable for forming such traps in point bars, isolated meander channels and braided stream channels.

The type well was completed through perforations from a depth of 2512 to 2569 feet. After acidizing and fracture treatment the well flowed at a rate of 170 mcfd through 3/16" choke on a 12 hour initial potential test. The porosity log of the perforated interval indicates porosity ranging from approximately 15% to 17% in three sands. They have a combined net thickness of 45 feet, 34 feet of which show excellent density-neutron crossover. Those porosity and net pay values would be sufficient for commercial gas production where adequate permeability is also in effect. The most likely areas for a combination of those factors in these flood-plain deposits will be at or near the axes of fluvial channels, and those channels are most likely to be encountered where the total net sandstone of the Pecos Slope facies is thickest. A map of the total net sandstone thickness of the pay interval is shown on figure 2.

MIDDLE AND LOWER ABO RESERVOIRS: Secondary objectives in the unit are a sandstone at the base of the Middle Abo formation and several sandstones in the Lower Abo (figure 3). Although these appear to be wet in the type well some have produced gas in the West Pecos Slope field and are considered potential reservoirs in the unit area.

"GRANITE WASH" AND FRACTURED BASEMENT: In the complex assemblage of weathered igneous and metamorphic rocks beneath the Abo there is some potential for encountering commercial hydrocarbons. In at least one instance gas has been tested in non-commercial quantities through perforations from a tight, fractured, basement quartzite in the McKay Oil Corporation No. 4 Inexco State in section 30, Township 5 South, Range 22 East, east of the Charolette Unit.

Charolette State Unit
Chaves County, New Mexico

CONCLUSIONS: The Charolette Unit is prospective in the Abo Pecos Slope facies and lower Abo zones. Porous gas-bearing sandstones are present in the vicinity. Apart from market conditions, finding commercially viable gas reserves will depend upon pay thickness and adequate permeability. In the Pecos Slope interval these factors are most likely to be favorable in the areas of isopach thicks.

George R. Reddy
Roswell, New Mexico

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
CASE NO. _____

CHAROLETTE UNIT

FIGURE 3

COMPENSATED NEUTRON LITHO DENSITY

COMPANY YATES PETROLEUM CORPORATION

WELL ESPERANZA XP FEDERAL #2

FIELD WILDCAT

COUNTY CHAVES STATE NEW MEXICO

LOCATION 660' FSL & 1780' FWL,

API SERIAL NO	SEC	TWP	RANGE
	26	4-S	20-E

Other Services:
EPT
DLL/MSFL
CNL/LDT/EPT

Permanent Datum G.L. Elev. 4481
Log Measured From K.B. 9 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 4490
D.F. 4489
G.L. 4481

Date	11-23-83			
Run No.	ONE			
Depth-Driller	3900			
Depth-Logger	3898			
Btm. Log Interval	3895			
Top Log Interval	50			
Casing-Driller	9 5/8@ 822	@	@	@
Casing-Logger	823			
Bit Size	7 7/8			
Type Fluid in Hole	SALT GEL STARCH			
Dens. Visc.	10.0 53			
pH Fluid Loss	3.5 ml	ml	ml	ml
Source of Sample	PIT			
Rm @ Meas. Temp.	.109 @ 61 F	@ F	@ F	@ F
Rmf @ Meas. Temp.	@ F	@ F	@ F	@ F
Rmc @ Meas. Temp.	@ F	@ F	@ F	@ F
Source Rmf / Rmc				
Rm @ BHT	.0 @ 9 F	@ F	@ F	@ F
Time Circulation Stopped	00			
Time Logger on Bottom	05			
Max. Rec. Temp.	96 F	F	F	F
Equipment Location	8185 RSWL			
Recorded By	GREER			
Witnessed By	BENTZ			

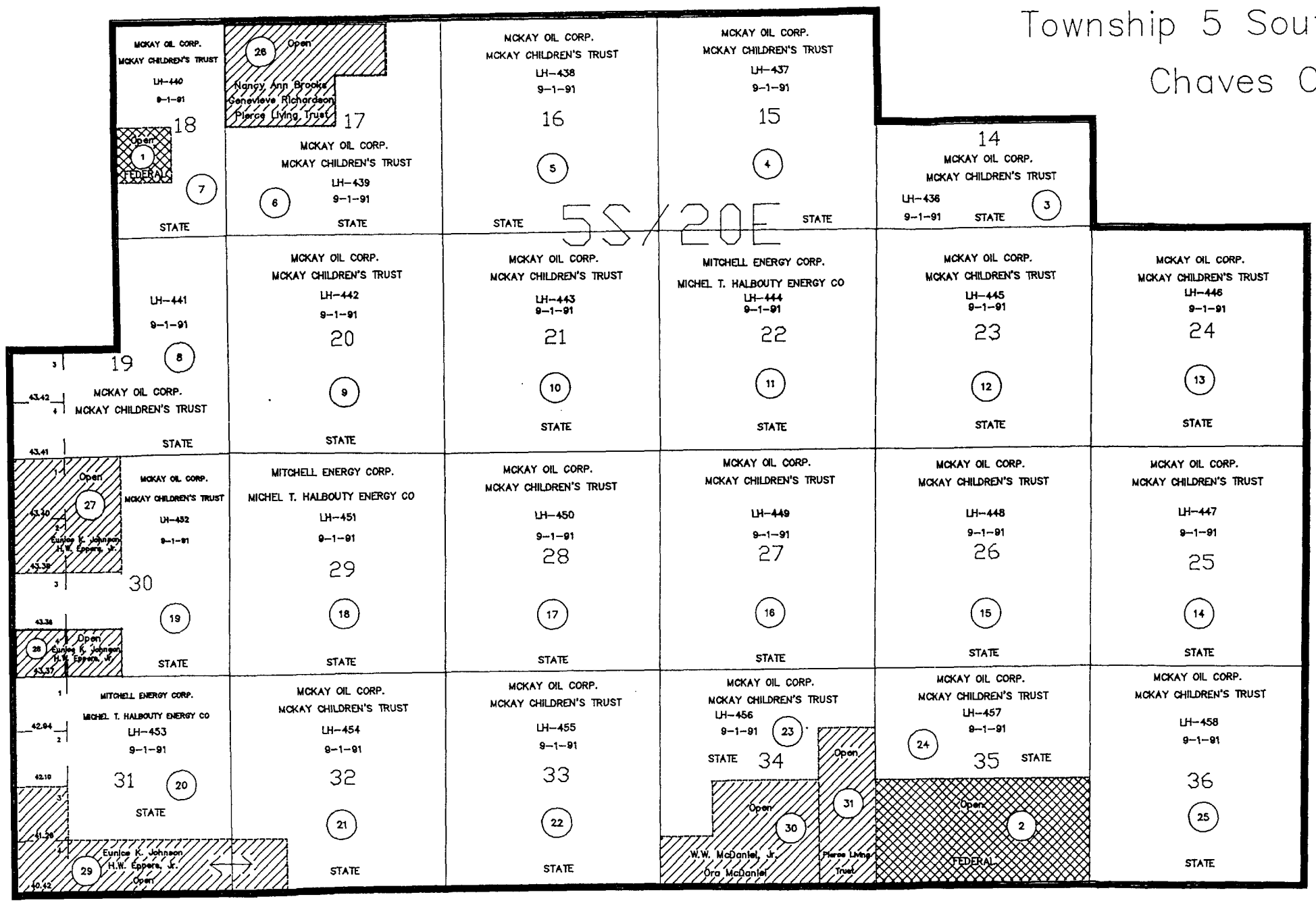
RECEIVED BY
JAN 23 1984
O. C. D.
ARTESIA, OFFICE

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. 4
CASE NO. 10324

CHAROLETTE STATE UNIT

Township 5 South, Range 20 East, NMPM

Chaves County, New Mexico



Unit Outline

(1) Tract Number

FEDERAL LANDS

STATE LANDS

FEE LANDS

360.00 FEDERAL ACRES

12,575.07 STATE ACRES

1,011.66 FEE ACRES

13,946.73 TOTAL UNIT ACRES

SCALE IN MILES

1 0 1 2 3

McKay Oil Corporation

Roswell, New Mexico

Exhibit A