

TABLE 3—(Continued)

	GUADALUPE COUNTY—Continued				HIDALGO COUNTY										JACKSON COUNTY		JIM HOGG COUNTY
Min. Tech. Lab. No.	60193	60194	60195	60196	60261	60262	60263	60264	60265	60266	60267	60268	60269	60270	60319	60320	60160
Field locality No. <sup>a</sup>	7	8	10	11	4	6B	6D	6E	7B	8	9	10	11	12	1	3	5
Free lime (carbonates)	Negative	Slightly positive	Positive	Slightly positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Negative
Benzidine test	Greenish	Light blue	Light blue	Greenish blue gray	Very faint blue	Faint blue	Faint blue	Blue	Pale blue	Blue	Blue	Blue	Very faint blue	Very faint blue	Slight blue	Very faint blue	Light blue
Color (air-dried)	Dark buff	Greenish buff	Cream	Dark buff Greenish	Gray	Tan	Tan	Buff	Light tan	Tan	Gray	Tan	Tan	Light tan	Light tan	Brown	Pinkish gray
Oil absorption— Calcline 450°C	----	39	----	70	----	----	----	----	----	----	----	----	----	----	----	----	----
Air-dried	Slow	Fast	Slow	37	Fast	Fast	Fast	Slow	Fast	Fast	Fast	Slow	Fast	Medium	Fast	Fast	Medium
Moisture (H <sub>2</sub> O-) (%)	4.69	8.28	1.39	4.59	3.17	1.64	4.80	4.04	1.17	4.77	5.33	4.43	4.18	4.35	4.64	5.73	12.74
Ignition loss— 300–600°C (%)	3.34	3.92	4.14	5.57	5.33	3.54	5.60	4.56	2.64	5.23	4.67	3.32	4.68	6.00	2.49	5.20	1.89
105–1050°C (%)	7.67	10.37	36.37	10.28	10.91	8.90	10.18	10.26	24.31	17.18	16.10	13.15	9.19	11.50	6.11	13.33	6.04
Water of plasticity (Atterberg test)— Average (%)	72	81	32	84	41	25	65	71	25	63	55	42	49	48	46	61	95
Difference (%)	67	89	26	107	28	26	84	64	5	67	64	48	40	57	50	67	50
Swelling test (percent increase in volume)— In distilled water	116	108	50	254	43	32	345	96	21	96	91	50	124	145	100	127	184
In salt water	96	65	29	87	39	18	84	63	32	73	76	38	62	75	72	96	72
Slaking test (–100 mesh) (%)	26	15	<10	44	20	53	90	98	<5	18	19	37	44	32	20	15	71
Bloating test: 10 minutes at— 2000°F	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2200°F	----	Negative	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2400°F	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Yield of 15 cp. drilling mud (bbl. per ton)— Untreated	----	Very low	----	Very low	----	----	----	----	----	----	----	----	----	----	----	----	Low
Treated with soda ash	----	65	----	Very low	----	----	Very low	----	----	----	----	----	----	----	----	----	60
pH value	8.0	8.3	8.3	8.2	9.0	8.7	9.5	9.1	9.3	8.4	8.6	9.3	9.1	9.4	8.8	8.1	7.9
Decolorizing efficiency compared to AOCS official clays— Natural with natural (%)	----	Very low	----	31	----	----	Very low	----	----	Very low	----	----	----	----	----	----	24
Activated with activated (%)	----	59	----	42	----	----	----	----	----	----	----	----	----	----	----	----	50
Firing test— Powder—2200°F (1204°C)	Brown	Dark brown	Buff	Dark brown	Buff	Buff	Dark brown	Dark brown	Brown	Brown	Brown	Brown	Buff	Buff	Dark brown	Dark brown	Brown
2400°F (1316°C)	Steel hard	Fused	Powder	Fused	Fused	Fused	Fused	Fused	Vitrified	Fused	Fused	Fused	Fused	Fused	Fused	Fused	Vitrified
2600°F (1427°C)	Fused	----	Vitrified	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Disks, ½-inch diameter— (Approx. cone 02) 2000°F (1093°C)	Reddish brown	----	----	----	----	----	----	Buff vitrified	----	----	----	----	----	----	----	Brick red	----
(Approx. cone 7) 2200°F (1204°C)	Fused	----	----	----	----	----	----	Softened	----	----	----	----	Buff	----	----	Dark brown	----
(Approx. cone 15) 2600°F (1427°C)	----	----	----	----	----	----	----	Excessive shrinkage	----	----	----	----	Steel hard	----	----	Fused	----
Loss on ignition at— 105–300°C	3.07	4.20	0.65	1.96	1.57	0.76	1.34	1.56	0.69	1.72	2.13	1.54	1.14	0.92	1.72	2.41	2.50
300–450°C	1.79	1.81	0.79	2.31	0.91	0.56	1.21	1.00	0.26	3.42	3.23	1.76	1.91	1.26	1.50	2.70	0.42
450–600°C	1.55	2.11	3.35	3.26	4.42	2.98	4.39	3.56	2.38	1.81	1.44	1.56	2.77	4.74	0.99	2.50	1.47
600–900°C	0.88	2.22	31.46	2.50	} 4.01	} 4.60	} 3.24	} 4.14	} 20.98	} 10.23	} 9.30	} 8.29	} 3.37	} 4.58	} 1.90	} 5.72	} 1.55
900–1050°C	0.38	0.03	0.12	0.25													
Neutralization value as CaCO <sub>3</sub>	----	----	57.2	12.3	18.7	16.4	15.6	16.3	51.8	30.1	27.6	22.8	15.6	21.4	6.4	18.5	0.10

Remarks<sup>b</sup> (samples arranged by Min. Tech. Lab. numbers)—  
No. 60193 NIU as a clay. This clay shattered to fragments when fired at 2000°F (approximately cone 02).  
No. 60194 A bentonite suitable for drilling mud when chemically treated. Yields 65 barrels of 15-cp mud per ton of clay when treated with sodium carbonate. FTR. Medium oil decolorizing capacity (59% compared with AOCS official activated earth). Low oil absorbing capacity.  
No. 60195 NIU as a clay. Contains 57.2% carbonates NV.  
No. 60196 Low yield of drilling mud. The oil decolorizing capacity after acid-activation is 42% compared with the AOCS official activated earth. When calcined at 450°C, it absorbs 70% of its weight of 20W lubricating oil (commercial oil absorbing floor sweeps absorbs over 110%).  
No. 60261 NIU as a clay. A silty calcareous clay containing 18.7% carbonates NV.  
No. 60262 NIU as a clay. Contains silt and 16.4% carbonates NV.  
No. 60263 NIU as a clay. Low yield of drilling mud even after chemical treatment. Low oil decolorizing capacity. Contains 15.6% carbonates NV.  
No. 60264 NIU as a clay. Softens at 2000°F (cone 07). Shows excessive shrinkage. A calcareous clay containing 16.3% carbonates NV.  
No. 60265 NIU as a clay. A silty calcareous clay containing 51.8% carbonates NV.  
No. 60266 NIU as a clay. Very low decolorizing capacity. A calcareous clay containing 30.1% carbonates NV.  
No. 60267 NIU as a clay. A calcareous clay containing 27.6% carbonates NV.  
No. 60268 NIU as a clay. A calcareous clay containing 22.8% carbonates NV.  
No. 60269 NIU as a clay. A silty calcareous clay containing 15.6% carbonates NV.  
No. 60270 NIU as a clay. A silty calcareous clay containing 21.4% carbonates NV.  
No. 60319 NIU as a clay. A silty calcareous clay containing 6.4% carbonates NV.  
No. 60320 NIU as a clay. Fired at 2000°F, this sample shattered. At 2200°F, it melted. A calcareous clay containing 18.5% carbonates NV.  
No. 60160 A bentonite capable of yielding 50 barrels of 15-cps drilling mud per ton of clay treated with sodium carbonate. It may be possible to increase this yield by varying the chemical treatment. As a drilling mud FTR. The oil decolorizing capacity of this bentonite after acid-activation is 50% compared with AOCS official activated earth. Very low oil absorbing capacity.

<sup>a</sup> See Plate 2 for location.  
<sup>b</sup> The following abbreviations are used:  
AOCS= American Oil Chemists' Society.  
FTR= Further testing by a specialized laboratory is recommended.  
NIU= No important industrial (or commercial) use.  
NV= Neutralization value expressed as calcium carbonate.  
ECB= With the possible exception of common brick. Clays containing as high as 20% carbonates have been included in this classification because there are several plants in operation in Texas producing brick from such clays. Normally it is not desirable to use clays containing more than 3% carbonates (U.S. Bureau of Mines Bulletin 565). The presence of excessive carbonates (lime and magnesia) causes undue shrinkage and shortening of the firing range. Closely regulated firing is required to overcome the latter.  
15-CP= 15-centipoise.