

*Culver's description
Rec'd from Equity*

EQUITY OIL COMPANY

Core Descriptions
Sulphur Creek #10

- Core No. 1, 1000 - 1023°, 23°, recovered 7½°, cored in 4 hrs & 20 min.
- 1000 - 1002½ Oil shale - dark brown with some visible banding, Large irregular, open vugs in upper six inches (2" in largest dimension)
- 1002½ - 1007½ Shale: gray to grayish-tan, thinly banded. Trace of very fine, discontinuous "patchy" porosity. Bottom six inches of core has a brecciated appearance. There appears to be a little porosity associated with this section of core.
- Core No. 2, 1023 - 1034°, 11° in 2 hrs 15 min., rec. 3½°
- 1023 - 1023½ Shale: Grayish-tan, brecciated. In addition to trace of very fine porosity associated with the breccia, has few small open vugs.
- 1023½ - 1024½ Shale: Grayish-tan, brecciated, has a little very fine porosity in fractures between breccia.
- 1024½ - 1025½ Shale: Dark brown, with scattered open vugs up to 1" in diameter.
- 1025½ - 1026½ Shale: Gray to dark brown, banded. Contains one large, open vug (4")
- Core No. 3, 1034 - 1045°, 11° in 4½ hrs, rec. 5°
- 1034 - 1035 Shale: Dark brown. No visible porosity.
- 1035 - 1038 Shale: Grayish-tan, thinly banded, no visible porosity.
- 1038 - 1039 Shale: Dark brown alternating with grayish tan. Has good vertical fracture and several vugs up to 1" in diameter.
- Core No. 4, 1045 - 1070°, 25° in 56 min., rec. 13°
- 1045 - 1048½ Oil Shale: Varies from massive to granular in about equal proportions. Massive shale contains a few large disconnected vugs, granular shale has the appearance of dolomite under the microscope and has fair, real fine porosity. Porosity is in the form of small elongated opening that are apparently pseudomorphs after some crystalline mineral.
- 1048½ - 1049 Oil Shale: Brecciated shale, with massive oil shale making up the main part of the section, but with granular shale filling a part of the interstitial openings. Appears to possess good ~~mass~~ porosity.
- 1049 - 1049½ Oil Shale: Massive, dark brown
- 1049½ - 1058 Oil Shale: Mainly granular in character, with some sections exhibiting good porosity like that in top of core.
- Core No. 6, 1113 - 1139°, 26° in 2½ hrs., rec. 14°
- 1113 - 1127 Oil shale: Light tan to light brown, banded. Contains scattered large vugs and few thin streaks of granular oil shale with a fine por.
- Core No. 5, 1070 - 1113°, 43° 4 hrs, recovery 29°
- 1070 - 1099 Oil shale: Tan to brown, massive to slightly granular, lighter colored shale is thinly banded. All of the section has a few large, apparently unconnected vugs. Vugs have a rough surface, but no iron or similar mineral has been found associated with them as in Sul. Creek No. 4
- Core No. 7, 1139 - 1174°, 35° in 2½ hrs., rec. 25°
- 1139 - 1164 Oil Shale: Tan to light brown, banded to massive. Contains a few small to medium sized, disconnected vugs.

Core No. 16, 1560 - 1616°, 56° in 10-3/4 hrs, rec. 56°

1516 - 70 Oil Shale: Low grade, tan to light brown, interbedded zones and vugs of amber colored trona. Cores are deeply pitted from solution of trona and all sections were bleeding gas when pulled. It is estimated 60% of this section has strong mixture of trona with the shale.

1570 - 78 Oil Shale - Low grade oil shale as above containing large trona filled filled vugs (now partially dissolved out). Vugs are mainly without continuity and on solution vugs exhibit a scoria type appearance with blades made up of oil shale as in massive section.

1578 - 91: Oil Shale - Low grade, light to tan to light brown with a few scattered vugs as above (actually 4)

1591 - 92 Scoria - Trona zone dissolved almost completely. Blades are made up of oil shale as in massive section

1592 - 92½ Oil Shale - Massive, light tan.

1592½- 97 Mainly trona with oil shale in a scoria like form. Strong bleeding gas.

1597 - 1615 Oil Shale - Light tan, low grade, few scattered large vugs filled with trona.

1615 - 16 Trona and low grade oil shale bleeding gas.

Note: From a close examination of the apparent porous zones in this core, it is clearly evident that the insitu porosity of this section is very low and that the gas bleeding from the various sections is due to solution of the trona and most of the gas present is entrapped in the enclosed section of the trona and released upon solution of the minerals.

Core No. 17, 1616 - 74°, 58°, full recovery, 6 hrs 40 min. coring time.

1616 - 30° Oil Shale - Massive, dark brown to brown, becoming banded toward base. No visible porosity.

1630 - 50½ Oil Shale - Thinly interbedded, light tan and brown, no visible porosity but slight bleeding of gas on bedding planes when pulled.

1650½- 52½ Interbedded trona and oil shale - with considerable vuggy porosity due to solution of trona. No visible porosity in the interior. Some bleeding of gas.

1652½- 55 Oil Shale - Interbedded light tan and brown, numerous trona filled vugs.

1655 - 74 Oil Shale - Massive, light brown, somewhat banded with trona. No visible porosity.

Core No. 18, 36° in 11 hrs, rec. 37° (?)

1674 - 76½ Oil Shale - Light brown, odor of asphalt on fresh fractures.

1678½- 87½ Oil Shale - Dark brown, massive, good odor of asphalt on fresh fractures no visible porosity.

1687½- 91 Oil Shale - Low grade, thinly banded, light tan & brown.

1691 - 96 Oil Shale - Dark brown, massive, odor of asphalt on fresh fractures, no visible porosity.

1696 - 1701 Oil Shale - Thinly banded, dark brown and tan, bands vary in thickness from fraction of an inch to one inch.

1701 - 1710 Shale - Massive, dark brown, distinct oil on fresh fractures.

Core No. 19, 1710 - 55, 45°, full recovery

1710 - 10 Oil Shale - Light tan to light brown, banded, thinly bedded, odor of asphalt on fresh fractures. No visible porosity.

1719 - 28 Shale - Dark grey, thinly interbedded w/oil shale as above, no vis. por.

1728 - 35 Oil Shale - Thinly banded tan to light brown, asphalt odor on fresh fractures, no visible porosity.

1735 - 55 Shale - Blue-grey and grey, thinly banded w/few thin streaks of oil shale as above. Core cleaves readily along bedding planes.

Notes on Equity Oil Co. Sulfur Creek No. 10 Well. Sec. 24, T. 2 S., R. 98 W.
Examined July 1, 1959, by D. C. D.

Core stored in Equity core shed on Sulfur Creek. 31 boxes of poorly marked core, not loggable without more complete information. Each box has about 23 feet of $3\frac{1}{2}$ inch core probably from lower oil shale zone.

Notes from daily drilling reports show the following depths of core runs.
Comments on lithology made after recording driller's depths of core runs.

	Depth in feet	
Core 1	1000 - 1023	
Core 2	1023 - 1034	
Core 3	1034 - 1045	
Core 4	1045 - 1070?	} shale (marlstone) and siltstone = some saline minerals
Core 5	1070? - 1113	
Core 6	1113 - 1139	
Core 7	1139 - 1174	
Core 8	1174 - 1189	
Core 9	1189 - 1229	
Core 10	1229 - 1258	
	1258 - 1410	- - - no core (shale, from driller's log)
Core 11	1410 - 1467	
Core 12	1467 - 1481	
Core 13	1481 - 1493	} good oil shale, abundant saline minerals in = interval 1467 to about 1650; (2 samples from 1560 - 1616 interval, reported as nahcolite by Milton).
Core 14	1493 - 1502	
Core 15	1502 - 1560	
Core 16	1560 - 1616	
Core 17	1616 - 1674	
Core 18	1674 - 1710	
Core 19	1710 - 1755	
Core 20	1755 - 1801	
Core 21	1801 - 1854	
Core 22	1854 - 1902	} fissil shale and marlstone, dark brown, probably = good oil shale, (sample 1807 ft.).
Core 23	1902 - 1921	
Core 24	1921 - 1923	
	1923 - 2204	no core (shale, driller's log)
Core 25	2204 - 2254	
	2254 - 2280	no core
Total depth	2280	

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY^{1/}

Core samples of Equity Oil Company's Sulphur Creek No. 10 well drilled
in C SW1/4SW1/4 sec. 24, T. 2 S., R. 98 W.,
Rio Blanco County, Colorado

Kelly bushing elevation 6350 feet Sampled section 1000 to 2250.3 feet

From	To	Description
<u>Core 1</u>		
1000.0	1001.6	Oil shale, rich: dark brown to dark brownish-gray (7.5YR 3/4-3/2, rare 2/2). Very faint distorted bedding to fairly distinct slightly irregular and distorted laminations. Very irregular to slightly irregular thick parting; some very irregular fracture. Common large vugs and spongy to gritty zones of collapse breccia; common yellow limonite stains. Some buff to dark gray tuffaceous stringers in lower part. Sample of buff to dark gray tuffaceous stringers from 1001.5 feet: X-ray - pyrite, ferroan (magnesian siderite), quartz, dawsonite, dolomite.
1001.6	1003.1	Oil shale, medium to lean: dark brownish-gray to tan (10YR 3/2-7/3, rare 2/2). Distinct slightly distorted laminations with some displacements and small loop structures to irregular distorted streaks and stringers. Some thin buff to dark gray stringers (like 1001.5 feet). A 1/2-inch chalky white tuff band with an angular broken end in distorted shale at 1002.5 feet. Sample of chalky white tuff from 1002.5 feet: X-ray - ferroan, feldspar (sanidine?).
1003.1	1006.7	Oil shale, medium: medium and rare dark brown to buff (10YR 4/4-6/3, rare 3/4). Massive to distorted streaked bedding. Very irregular parting and fracture. Very common small to fine vugs and some earthy stringers. Common yellow limonite stains.
1006.7	1023.0	Missing.
<u>Core 2</u>		
1023.0	1025.2	Oil shale, rich to very rich: dark brownish-gray (10YR 3/2-2/2), some to common very slight resinous luster. Faint irregular, distorted to contorted laminations; rare poorly formed loop structures. Slightly irregular to very irregular, thick to medium parting. Some large vugs and contorted to brecciated shale in upper part.
1025.2	1026.6	Oil shale, rich: medium to dark brownish-gray (10YR 4/3-3/2, some 5/3). Irregular distorted laminations to streaked bedding. Irregular, thick to medium parting. Rare small to large vugs. Common limonite stains.
1026.6	1034.0	Missing.

^{1/} By L. G. Trudell Illustration No. SBR-3775P (Sheet 1 of 44)

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1060.7	1070.0	Missing? (Cores 5 through 8 may be mixed up and/or turned around; all footages doubtful.) Core 5?
1070.0	1071.1	Oil shale, lean: light to dark brownish-gray (10YR 7/3-3/2, some very slight olive tint). Distinct irregular, distorted to contorted and displaced laminations. Very regular to irregular, thick to thin shaly parting.
1071.1	1073.0	Oil shale, medium to lean: dark brownish-gray and dark to rare light brown (10YR 3/2 and 3/4-5/3, rare 7/4), some olive-gray (2.5Y 5/3). Faint distorted streaked bedding to massive. Very irregular thick parting; some conchoidal fracture. Some small irregular masses of brownish-gray and dark gray to black material (like 1035.6 feet).
1073.0	1074.0	Break (ends do not fit).
1074.0	1076.7	Oil shale, medium: dark brownish-gray to some dark brown (10YR 3/2, some 3/3-3/4). Faint smooth to distorted streaked bedding. Slightly irregular thick parting. Rare large vugs--some with brownish-gray friable mud fillings. Very rare thick dense brown dolomite stringers. Some very fine disseminated pyrite and very fine grained pyrite streaks in lower part.
1076.7	1078.0	Oil shale, very rich: brownish-black to brownish-gray (10YR 1/2-4/2, rare 5/3), common resinous to waxy luster. Faint to distinct, very irregular, smooth to slightly contorted laminations. Irregular thick parting. Vuggy limonite stained parting surfaces at 1077.4 feet.
1078.0	1079.7	Oil shale and tuff: dark to medium brownish-gray (10YR 3/2-5/3) oil shale with very faint distorted streaked bedding and common very irregular distorted streaks and stringers of earthy buff (10YR 6/3-7/3) tuff. Very irregular parting and fracture. Some small to medium limonite stained vugs. Some small massive pyrite blebs near top.
1079.7	1080.9	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2-3/3, rare 4/3). Faint streaked bedding to irregular distorted laminations. Irregular thick parting. Some small to large vugs with some dark gray gritty fillings. Some irregular buff tuff streaks and stringers. Rare small fine-grained pyrite lenses
1080.9	1081.0	Break (ends do not fit).
1081.0	1082.7	Oil shale, lean or medium: olive-gray (2.5Y 5/3-4/2) and rare light to dark brownish-gray (10YR 6/3-3/2), rare resinous to waxy luster in dark brownish-gray shale. Massive to faintly bedded and some distinct irregular bands. Slightly irregular to very irregular thick parting; very irregular fracture. Common 1/2- to 2-inch.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
		some very irregular fracture. A large spongy to muddy mass with some collapse breccia and yellow limonite stains in middle part.
1124.2	1125.4	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, rare 4/3-5/3 and 2/2; rare very slight olive tint). Fairly distinct irregular distorted laminations and some thick faintly bedded bands. Regular to slightly irregular thick parting. Some very irregular, fine to 1/4-inch earthy buff tuff stringers near base. A 1/4-inch, distorted and sharply broken silty gray band with some very fine disseminated pyrite at 1125.1 feet. Sample of gray band from 1125.1 feet: X-ray - ferroan, magnesite (?), pyrite, feldspar.
1125.4	1130.0	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2, rare 3/3-4/2). Very faint smooth to slightly distorted streaked bedding. Regular and rare irregular thick parting; some very irregular to conchoidal fracture. Very rare fine black pitchy streaks. Very abrupt change to laminated shale below.
1130.0	1132.4	Oil shale, lean: medium to light and rare dark brownish-gray (10YR 4/2-6/3, rare 3/2-2/2). Distinct slightly irregular and distorted laminations; common loop structures. Very regular to slightly irregular thick shaly parting. Some fine vertical fractures with brown varnish-like coatings. A very irregular earthy buff tuff stringer at 1131.6 feet. Very rare waxy streaks in lower part.
1132.4	1133.0	Oil shale and tuff: light to dark brownish-gray (10YR 6/3-2/2), chalky to earthy in part. Very irregular distorted to contorted streaks and stringers; a few large angular chalky white and buff inclusions--probably fragments of a tuff band. Irregular parting and fracture. Some small to large masses of dark gray to black sooty material with associated limonite stains. Sample of dark gray to black sooty masses from 1132.7 feet: X-ray - pyrite; some analcite, quartz, feldspar, dolomite, siderotil. Sample of white and buff inclusions from 1132.8 feet: X-ray - dolomite, quartz, feldspar.
1133.0	1134.0	Break (ends do not fit).
1134.0	1135.2	Oil shale, rich: medium to dark brownish-gray (10YR 4/3-3/3, some 5/3 and 3/2; rare very slight olive tint), rare resinous to waxy luster. Very irregular streaks and stringers to slightly irregular and distorted laminations with rare loop structures. Slightly irregular thick parting. A vuggy limonite stained parting surface at top. Several thin contorted buff tuff stringers at 1134.5 feet.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1146.8	1150.7	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2-3/3, rare 4/2-5/2 and 2/2; some almost neutral). <u>Very</u> faint to faint, smooth to slightly irregular and distorted laminations. Very regular thick shaly parting; rare conchoidal fracture. Some brown to buff tuffaceous shale near base.
1150.7	1151.0	Break (ends do not fit).
1151.0	1151.7	Oil shale, rich: dark to rare medium brownish-gray (10YR 2/2-3/3, rare 4/3), some resinous and rare waxy luster. Smooth to slightly irregular and distorted laminations (some laminae make an angle of about 45 degrees with edge of core). Very regular to slightly irregular thick parting. Some thin irregular buff tuff stringers at base.
1151.7	1152.0	Break (ends do not fit).
1152.0	1156.4	Oil shale, medium: medium to dark brownish-gray and some dark brown (10YR 4/3-3/2, some 3/4). Very faint distorted streaked bedding; some massive near top. Slightly irregular to very irregular thick parting; some very irregular fracture. Rare small to large vugs--some with muddy tan fillings and some with pyrite and black gritty fillings. Rare fine black gilsonite-like streaks near base.
1156.4	1156.9	Marlstone: tan to brownish-gray (10YR 6/3-5/3, rare 4/3). Very faint smooth to slightly irregular and distorted laminations. Regular thick to thin shaly parting. Rare gray laminae.
1156.9	1159.3	Oil shale, very rich to rich: medium to dark olive-gray (2.5Y 4/2-2/2) and dark brown to dark brownish-gray (10YR 3/4-2/2), some to rare very slight resinous luster and very rare waxy luster. Faint to very faint distorted streaked bedding and some laminations. Slightly irregular to very irregular thick parting; some very irregular fracture. Rare fine earthy buff streaks in lower part.
1159.3	1160.8	Oil shale, medium: gray (4.5-5.5N), olive-gray (5Y 5/2-4/2), and medium to light brownish-gray (10YR 4/3-7/3). Faintly bedded porous shale in upper 0.3 foot; brecciated and jumbled in other parts--some very large angular fragments near base. Very irregular fracture; no prominent parting. <p style="margin-left: 40px;">Sample of gray and olive-gray brecciated shale from 1160.1 feet: X-ray - dolomite, quartz, feldspar, pyrite.</p>

Illustration No. SBR-3775P (Sheet 7 of 44)

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1198.4	1229.0	Missing.
Core 10		
1229.0	1229.5	Oil shale, medium: light to dark brownish-gray (10YR 6/2-3/2, some very slight olive tint). Slightly irregular and distorted laminations to very faint bedding. Regular medium to thick shaly parting.
1229.5	1230.2	Oil shale, medium: medium to dark brownish-gray (10YR 4/3-3/3, rare 5/3 and 3/2). Massive to very faintly bedded. Irregular parting and fracture. Common small to large vugs with gray gritty fillings; some finely porous shale. Common yellow limonite stains.
1230.2	1231.2	Oil shale, medium: light to dark brownish-gray (10YR 6/2-2/2). Distinct to faint slightly irregular and distorted laminations; rare loop structures and small displacements. Regular thick shaly parting. Rare short vertical fractures with varnish-like coatings.
1231.2	1234.3	Oil shale, medium: dark brown and dark to rare medium brownish-gray (10YR 3/4-3/2, rare 4/3-5/3). Very faint distorted bedding. Irregular to some regular, thick to thin parting; some very irregular and rare hackly fracture. Common vuggy streaks, stringers, and spots of gray to black, gritty to crystalline material with common pyrite. Common yellow limonite stains.
1234.3	1235.5	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2, rare 5/2). Very irregular, distorted, and displaced to very regular and smooth laminations; rare poorly formed loop structures. Very irregular to regular thick parting. Very rare small dark limonite stained crystalline masses.
1235.5	1237.9	Oil shale, rich: dark brownish-gray to brownish-black (7.5YR 2/2-1/2, rare 3/2-3/3). Very faint distorted streaked bedding. Slightly irregular to very irregular thick parting; some very irregular fracture. Rare small to very large vugs--some with gray gritty fillings and limonite stains.
1237.9	1239.8	Oil shale, medium: medium to dark brownish-gray (7.5YR 4/3-2/2, rare 5/3). Faint distorted to contorted streaked bedding and rare laminations. Very irregular and rare regular thick parting. Some very large limonite stained vugs. One piece of gray to buff mudstone breccia. (Sample consists of large discontinuous core pieces--may be out of sequence.)

Illustration No. SBR-3775P (Sheet 9 of 44)

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1430.5	1443.2	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2-2/2, rare 4/2-5/3). Very faint distorted to smooth streaked bedding. Regular to irregular thick parting. Some very large coarsely crystalline nahcolite masses at 1432.9-1433.2, 1434.3-1435.0, and 1439.0-1439.2 feet. Some large black sooty masses at 1433.1 and 1435.5 feet. Very rare fine waxy to vitreous black streaks.
1443.2	1446.5	Oil shale, rich to very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2); common resinous to waxy luster in lower foot. Very faint distorted to smooth laminations and some streaked bedding; rare poorly formed loop structures. Slightly irregular thick shaly parting.
1446.5	1448.0	Oil shale, rich, tuffaceous: dark and some medium brownish-gray to brownish-black (10YR 3/2-1/2, some 4/3-5/3), some resinous to waxy luster. Irregular distorted laminations to contorted stringers. Regular to very irregular thick parting. A short vertical fracture with some white nahcolite crusts at 1447.1 feet.
1448.0	1450.1	Tuff: medium to light brownish-gray (10YR 5/3-6/3); some medium to dark brownish-gray oil-shale stringers (10YR 4/2-2/2), especially in upper 0.4 foot. Faintly bedded to massive with contorted stringers. Very irregular thick parting. Common very irregular and contorted, dark gray to white crystalline stringers with limonite stains in middle part. Sample of tuff with dark gray to white crystalline stringers from 1448.7-1449.0 feet: X-ray - quartz, calcite, dawsonite, dolomite.
1450.1	1451.0	Oil shale, medium, tuffaceous: medium to dark brownish-gray (10YR 5/3-3/2). Distorted streaked bedding. Slightly irregular thick parting. Rare small earthy buff inclusions.
1451.0	1454.0	Oil shale, medium or rich: dark and rare medium brownish-gray (10YR 2/2-3/2, rare 4/2-5/3). Very faint distorted and rare contorted streaked bedding. Regular to irregular thick parting. Some thin irregular dark gray limonite stained stringers at 1453.4 feet.
1454.0	1456.3	Oil shale, rich: dark brownish-gray (10YR 2/2, some 3/2, rare 4/3). Very faint slightly distorted streaked bedding. Regular to slightly irregular thick shaly parting. Very rare small dark brown to black crystalline patches. Very rare, very fine vitreous black streaks.

Illustration No. SBR-3775P (Sheet 11 of 44)

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1468.6	1470.4	Oil shale, rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2-3/3). <u>Very</u> faint distorted bedding to smooth laminations. Irregular to regular, thick to medium shaly parting. Very rare fine vitreous black streaks. Some to rare very fine disseminated crystals.
1470.4	1481.0	Missing.
<u>Core 13</u>		
1481.0	1486.0	Oil shale, rich: dark to rare medium brownish-gray and brownish-black (10YR 2/2-3/2, rare 4/2 and 1/2). Faint slightly distorted to smooth laminations. Very regular to irregular thick parting; some conchoidal fracture. Very rare fine gray laminae. Common fine contorted dark gray to black vuggy stringers with very common pyrite at 1485.0 to 1485.1 feet. Sample of shale with dark gray to black pyritic stringers from 1485.1 feet: X-ray - pyrite, quartz, calcite, dolomite, cryolite.
1486.0	1489.5	Oil shale, medium: dark to medium brownish-gray (10YR 3/2-4/2, rare 5/3). <u>Very</u> faint to faint, fine, smooth to distorted laminations; rare loop structures and imbricate displacements. Irregular thick parting; conchoidal fracture. Rare thin dark gray to black pyritic stringers (like 1485.1 feet).
1489.5	1491.1	Oil shale, medium: dark to rare light brownish-gray (10YR 2/2-4/3, rare 6/3) and rare olive-gray (2.5Y 4/2-3/2). Fairly distinct irregular and contorted to smooth laminations; rare imbricate displacements. Very irregular to regular, thick to medium parting. Some contorted dark gray to black pyritic stringers.
1491.1	1493.0	Missing.
<u>Core 14</u>		
1493.0	1493.9	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2) and some olive-gray (2.5Y 4/2), very rare resinous luster. Slightly irregular and distorted laminations. Regular thick to medium shaly parting. Rare buff tuff streaks. Some very close imbricate displacements near base. Rare thin gray pyritic streaks.
1493.9	1495.0	Oil shale, medium: medium to dark olive-gray (2.5Y 4/2-3/2, almost neutral) and medium to dark brownish-gray (10YR 5/3-3/2, rare 6/3). Faint smooth to slightly irregular and distorted laminations. Regular and rare irregular thick shaly parting.

Illustration No. SBR-3775P (Sheet 13 of 44)

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1527.5	1539.1	Oil shale, lean and medium: medium to dark and rare light brownish-gray (10YR 5/3-3/2, rare 2/2 and 6/3). Very faint to faint, slightly distorted streaked bedding and rare smooth to contorted laminations. Slightly irregular to very irregular, thick to medium parting. Rare small to large streaks, stringers, and radiating masses of nahcolite; one very large mass at 1536.9 to 1537.6 feet.
1539.1	1541.5	Nahcolite and oil shale: about 70 percent brownish-black to yellowish-gray nahcolite in <u>very</u> large coarsely crystalline radiating masses with some medium to rare dark brownish-gray (10YR 5/2-4/2, rare 5/3 and 3/2) oil shale. Very irregular parting and fracture.
1541.5	1544.6	Oil shale, medium: medium to rare dark brownish-gray (10YR 4/2-5/3, some 3/2, rare 2/2). Faint smooth to contorted streaked bedding. Slightly irregular to very irregular thick parting. Common large coarsely crystalline nahcolite masses in upper part; some small masses in lower part.
1544.6	1545.8	Nahcolite and oil shale: brownish-gray to brownish-black (10YR 5/2-1/2). Fine to coarsely crystalline; massive to radiating. Very irregular fracture and parting. Less than 30 percent brownish-gray oil shale (10YR 4/2-5/3).
1545.8	1547.6	Oil shale, medium or rich: medium to dark brownish-gray (10YR 4/2-3/2, rare 2/2), some resinous laminae and thin stringers. Very irregular distorted laminations and some very faint smooth streaked bedding. Slightly irregular to very irregular thick parting. An irregular 1/2- to 1-1/8-inch stringer of hard vitreous black organic material with conchoidal fracture and some gritty black material with pyrite at 1546.1 feet. Some small pyrite patches and stringers near base. (Black organic stringer almost entirely removed from assay sample.) Sample of black gritty material with pyrite from organic stringer at 1546.1 feet: X-ray - pyrite, cryolite, nahcolite.
1547.6	1548.6	Oil shale, rich: medium to dark brownish-gray (7.5YR 4/2-2/2), rare resinous to waxy streaks. <u>Very</u> faint smooth to slightly distorted streaked bedding. Irregular thick parting.

Illustration No. SBR-3775P (Sheet 15 of 44)

Laramie Petroleum Research Center, Laramie, Wyoming

August 28, 1963

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1576.0	1580.7	Oil shale, rich: dark brownish-gray (10YR 3/2-2/2, rare 3/3). <u>Very</u> faint slightly distorted streaked bedding to massive. Regular to irregular, thick to medium parting. Rare small dull black specks. Very rare small nahcolite masses (a large one at 1576.9 feet).
1580.7	1583.0	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2, some 3/3). Massive to <u>very</u> faint distorted streaked bedding. Very irregular and rare regular thick parting. Common small to large very irregular nahcolite masses, especially in lower half.
1583.0	1585.0	Oil shale, rich: dark brownish-gray (10YR 2/2-3/2). <u>Very</u> faint smooth to slightly distorted streaked bedding. Regular to irregular thick parting. Very rare small black specks.
1585.0	1586.0	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, some 3/3). Massive and some <u>very</u> faint distorted streaked bedding. Irregular thick parting. Some large irregular nahcolite masses.
1586.0	1589.2	Oil shale, rich: dark brownish-gray (10YR 2/2-3/2). <u>Very</u> faint smooth to slightly distorted streaked bedding. Slightly irregular to very irregular thick parting. Some small nahcolite patches and stringers at 1586.9 to 1587.3 feet.
1589.2	1589.7	Nahcolite: brownish-black and some reddish-brown to amber. Very coarse radiating crystals. Some interstitial shale.
1589.7	1590.1	Oil shale, very rich: brownish-black to dark brownish-gray (10YR 1/2-2/2). <u>Very</u> faint smooth streaked bedding. Irregular thick parting; slightly conchoidal fracture.
1590.1	1591.8	Nahcolite: dark brownish-gray to brownish black (10YR 3/2-1/2). Fine to coarse grained, faintly laminated to massive. Common thin shale partings.
1591.8	1593.0	Nahcolite: brown to dark brownish-gray (10YR 5/4-3/2). Fine to medium grained; faintly laminated. Some partings and rare bands of brownish-gray to dark brown oil shale (10YR 4/3-3/4).
1593.0	1595.0	Oil shale, lean: dark brown and medium to rare light brownish-gray (10YR 3/4-5/3, rare 6/3-8/3). Very faint smooth to distorted streaked bedding and some faint to distinct irregular, distorted and displaced laminations. Very irregular parting. Some medium to very large coarsely crystalline radiating nahcolite masses, especially in lower half.
1595.0	1596.1	Oil shale, very lean: medium to light brownish-gray and some buff (10YR 5/3-6/3, some 7/2-7/3). Very irregular, distorted to contorted stringers and some very faint streaked bedding. Irregular thick parting.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
		Sample of olive-gray shale from 1607.9 feet. X-ray - quartz, feldspar, dawsonite, pyrite, dolomite.
1608.5	1609.0	Oil shale, lean, tuffaceous: light to dark brownish-gray (10YR 7/3-2/2). Very irregular distorted to contorted streaks and stringers. Irregular thick parting.
1609.0	1609.9	Oil shale, medium or rich: dark and rare medium to light brownish-gray (10YR 3/2-2/2, rare 4/2-6/3), rare resinous to waxy luster. Very irregular distorted laminations, streaks, and stringers. Irregular thick parting.
1609.9	1612.4	Oil shale, rich: dark brownish-gray to rare brownish-black (7.5YR 3/2-2/2, rare 1/2), rare resinous to waxy luster. <u>Very faint</u> smooth to slightly distorted streaked bedding. Irregular to regular thick parting. Very rare fine dark gray to black pyritic stringers.
1612.4	1613.4	Nahcolite: dark brown to colorless. Medium fine grained, massive. Rare dark brownish-gray oil-shale stringers.
1613.4	1616.0	Missing.
		Core 17
1616.0	1617.6	Oil shale, lean: medium to dark and some light brownish-gray (10YR 5/3-3/2, some 6/3-7/2, rare 2/2). Contorted to distorted and some fairly smooth laminations; some thick very faintly bedded bands. Very irregular to slightly irregular thick parting. Some large irregular nahcolite masses in upper 0.3 foot (not radiating). A thin dull dark gray to black pyritic stringer at 1617.2 feet.
1617.6	1628.0	Oil shale, rich: dark brownish-gray (10YR 3/2-2/2). <u>Very faint</u> smooth to slightly distorted streaked bedding. Irregular to regular thick parting. Some irregular to lacy, dark gray to black pyritic stringers at 1621.7-1622.1 and 1627.6-1627.7 feet.
1628.0	1632.0	Oil shale, rich to medium: dark brownish-gray (10YR 2/2-3/2), rare dark to medium gray in lower half (3.5-4.5N). Very faint slightly irregular and distorted laminations and some streaked bedding. Irregular to very regular thick shaly parting.
1632.0	1633.0	Oil shale, medium: dark to medium brownish-gray (10YR 3/2-4/2, rare 5/3) and some medium to dark gray (4.5-3.5N). Irregular distorted and displaced to fairly smooth laminations; some poorly formed loop structures. Slightly irregular thick and rare thin shaly parting; slight hackly fracture.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1644.1	1646.3	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2). Faint slightly irregular and distorted laminations. Very regular to slightly irregular, thick to medium shaly parting.
1646.3	1649.6	Oil shale, medium: medium to dark and rare light brownish-gray (10YR 5/2-2/2, rare 6/2). Fairly distinct slightly irregular and distorted laminations. Slightly irregular to very regular, thick to medium shaly parting.
1649.6	1650.3	Oil shale, rich or very rich: dark and rare medium brownish-gray (10YR 3/3-2/2, rare 4/3), common resinous to waxy luster. Irregular distorted and rare contorted laminations; some loop structures. Slightly irregular thick parting.
1650.3	1652.7	Nahcolite: brownish-black to light brown. Medium to fine and rare coarse grained thick massive bands. Some thin to thick (up to 0.2 foot) bands of dark brownish-gray to brownish-black oil shale.
1652.7	1655.7	Oil shale, lean and very lean: light to rare dark brownish-gray (10YR 6/3-5/3, rare 4/3-3/2). Faint irregular distorted to contorted and some smooth laminations. Very irregular thick parting. Common small to large coarsely crystalline nahcolite masses and some thin massive bands and stringers.
1655.7	1662.5	Oil shale, rich: dark and some medium brownish-gray (10YR 3/2, some 4/2 and 2/2). <u>Very</u> faint smooth to very distorted streaked bedding. Irregular to very regular thick parting. Common thin dull black gritty crystalline stringers and lenses with massive pyrite and rare white crystals--some stringers appear to be bitumen impregnated. Rare glossy shear surfaces with slickensides. A large coarsely crystalline black bitumen impregnated nahcolite mass at 1656.5-1656.9 feet with some <u>very</u> coarse colorless transparent crystals at base. Sample of colorless transparent crystals from 1656.8 feet. X-ray - nahcolite.
1662.5	1664.2	Oil shale, lean: light to medium brownish-gray (10YR 6/3-4/3, rare 7/3). Faint to fairly distinct fine smooth to irregular, distorted and displaced laminations. Regular to very irregular thick parting.
1664.2	1668.3	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, rare 4/3). Faint to <u>very</u> faint, slightly distorted to smooth streaked bedding. Irregular to

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1684.8	1686.5	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2), rare very fine resinous to waxy streaks. <u>Very</u> faint smooth streaked bedding and rare irregular slightly distorted laminations. Regular to irregular thick parting.
1686.5	1687.2	Oil shale, very rich: dark and rare medium brownish-gray (10YR 3/3-2/2, rare 4/3), rare resinous to waxy luster. Very faint slightly irregular and distorted laminations. Slightly irregular thick shaly parting. Rare very fine black bitumen impregnated stringers.
1687.2	1689.8	Oil shale, medium: medium to rare light and dark brownish-gray (10YR 4/2-5/2 and 4/3-5/3, rare 6/2-7/2 and 3/2). Very irregular distorted to slightly contorted laminations, stringers, and streaked bedding. Irregular thick parting. Very rare resinous to waxy stringers. Rare small brown crystalline patches and stringers. <p style="margin-left: 40px;">Sample of shale with small brown crystalline patches and stringers from 1689.3 feet. X-ray - dawsonite, quartz, feldspar, calcite, dolomite.</p>
1689.8	1690.8	Oil shale, medium or lean: medium to some light and rare dark brownish-gray (10YR 5/3-4/3, some 6/2-7/3, rare 3/2). Distinct fine distorted, folded and imbricate faulted laminations to very faint distorted streaked bedding. Irregular thick parting. Rare small brown crystalline patches (like 1689.3 feet). <p style="margin-left: 40px;">Sample of finely laminated shale from 1690.0 feet. X-ray - quartz, dawsonite, feldspar, dolomite.</p>
1690.8	1693.3	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2), rare fine resinous to waxy streaks. <u>Very</u> faint smooth to distorted streaked bedding. Irregular thick parting. A thin vitreous black organic streak at 1692.1 feet.
1693.3	1695.5	Oil shale, rich: dark brownish-gray and rare brownish-black (10YR 3/2-2/2, rare 1/2). Faint to <u>very</u> faint, slightly irregular and distorted to very smooth laminations. Very regular thick to medium shaly parting; some hackly fracture. Very common fine gray to brown crystalline streaks from 1693.3 to 1694.6 feet. <p style="margin-left: 40px;">Sample of shale with fine crystalline streaks from 1693.6 feet. X-ray - quartz, dawsonite; some pyrite, dolomite.</p>
1695.5	1698.1	Oil shale, <u>very</u> rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/3), some to very common

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1705.8	1707.8	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, rare 2/2; some almost neutral). Faint slightly irregular and distorted to smooth laminations. Very regular to slightly irregular, thick to thin shaly and rare papery parting; hackly fracture. Rare dark gray discolored streaks and patches. Very rare fine massive pyrite streaks.
1707.8	1708.8	Oil shale, lean: medium to dark brownish-gray (10YR 5/2-3/2, rare 2/2, much almost neutral). Fairly distinct to faint smooth laminations. Very regular thick to medium shaly parting; some hackly fracture.
1708.8	1709.7	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, rare 2/2; some almost neutral):. Faint slightly irregular and distorted laminations; very rare loop structures. Very regular to slightly irregular, thick to thin shaly parting; hackly fracture.
1709.7	1710.5	Oil shale, rich: dark brownish-gray (10YR 3/2-2/2), very rare resinous luster. Very faint irregular, distorted to contorted laminations and stringers. Slightly irregular thick shaly to some papery parting; hackly fracture; elastic and tough.
(Footage adjustment)		
Core 19		
1710.0	1711.1	Oil shale, rich: dark brownish-gray and dark brown (10YR 2/2-3/2 and 3/4). Very faint distorted streaked bedding, superposed on alternating 0.2- to 0.3-foot bands of brownish-gray and brown; common small tan lenses in brown parts. Slightly irregular to very irregular, thick to medium parting; hackly to irregular fracture.
1711.1	1712.1	Oil shale, rich: dark brownish-gray (10YR 3/3-2/2), very rare resinous luster. Faint slightly distorted streaked bedding. Irregular thick parting; some hackly fracture. Rare very fine dark brown crystalline streaks.
1712.1	1712.6	Oil shale, medium to rich: medium to dark brownish-gray and some brownish-black (10YR 4/2-2/2, some 3/3 and 1/2), some resinous to waxy luster in lower half. Very faint slightly distorted streaked bedding to faint very irregular and distorted laminations. Very irregular thick parting. A small very dark brown cherty lens with yellowish-brown earthy rims at 1712.2 feet. Some fine dull black bitumen impregnated stringers with pyrite at 1712.3 feet.
		Sample of dark brown cherty lens with yellowish-brown rims from 1712.2 feet: X-ray - quartz; some dawsonite, dolomite.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1723.9	1725.0	Oil shale, medium: medium to dark and rare light brownish-gray (10YR 4/2-2/2, rare 5/3-6/3; some almost neutral), very rare resinous to waxy luster in upper half. Distinct to faint irregular, distorted and some slightly contorted laminations; rare deformed loop structures. Irregular to regular, thick to thin shaly parting. Rare small brown glassy lenses and oolitic aggregates with yellowish-brown to buff rims. Sample of brown glassy oolitic aggregate from 1724.1 feet: X-ray - quartz; some dolomite, dawsonite, pyrite.
1725.0	1727.3	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2, some almost neutral). Faint smooth to irregular and distorted laminations. Regular to slightly irregular, thick to thin shaly parting; irregular to hackly fracture. Rare dark brown crystalline stringers with disseminated pyrite.
1727.3	1728.4	Oil shale, medium to very rich: dark brownish-gray to brownish-black (10YR 3/2-1/2, some almost neutral), common resinous to waxy luster in lower 0.3 foot. Faint smooth to irregular and distorted laminations; rare loop structures. Regular to irregular, medium to thin shaly parting; irregular to hackly fracture; elastic and tough.
1728.4	1734.2	Oil shale, medium: medium to dark and some light brownish-gray (10YR 4/2-2/2, some 5/2-6/3, rare 7/3) and medium to dark olive-gray (2.5Y 5/2-3/2), some resinous to waxy stringers. Faint to distinct, very irregular and distorted laminations, stringers, and streaked bedding; some loop structures. Irregular to regular, thick to thin parting; irregular to hackly fracture.
1734.2	1735.7	Oil shale, rich or very rich: dark and rare medium brownish-gray to brownish-black (10YR 3/3-1/2, rare 4/2), common resinous to waxy luster. Faint to very faint irregular distorted laminations; some loop structures. Regular to irregular, thick to thin shaly parting; hackly fracture; elastic and tough. Rare small brown crystalline lenses.
1735.7	1737.0	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2-2/2, rare 4/2; some almost neutral). <u>Very</u> faint smooth laminations. Regular to slightly irregular, medium to thin parting; slight hackly fracture. Rare fine pyrite streaks.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1751.5	1753.5	Oil shale, medium or rich: dark brownish-gray (10YR 3/3-2/2). Very faint smooth to slightly distorted laminations. Regular to irregular, thin shaly to papery parting. Very badly broken up; uneven sample split.
1753.5	1755.0	Oil shale, lean: dark brownish-gray (10YR 3/3-2/2) and medium to dark gray (4.5-3.5N). Faint irregular, distorted and displaced to smooth laminations. Regular to irregular, thick to thin shaly parting; very irregular fracture. Uneven sample split.
1755.0	1756.2	Oil shale, medium: dark brownish-gray (10YR 3/3-2/2). Faint smooth to very contorted and intricately folded laminations. <u>Very</u> irregular thick to medium parting; very irregular fracture. Uneven sample split. Sample of contorted shale from 1755.6 feet: X-ray - illite, quartz, feldspar, dolomite.
(Footage adjustment)		
Core 20		
1755.0	1755.6	Oil shale, medium: medium to dark brownish-gray (10YR 5/3-2/2). Distinct to faint irregular distorted laminations; some loop structures. Slightly irregular thick shaly to papery parting; hackly to irregular fracture.
1755.6	1760.7	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2; most almost neutral) and some medium to dark gray (4.5-3.5N). Very faint smooth to irregular and distorted laminations. Very irregular to regular thick to thin shaly and rare papery parting; some very irregular fracture. Very badly broken up; uneven sample split.
1760.7	1761.7	Marlstone, silicic: light to medium gray (6.5-4.5N) and some light to rare dark brownish-gray (10YR 6/3-3/2). Very irregular distorted laminations and stringers. Irregular thick parting; some very irregular fracture.
1761.7	1762.4	Oil shale, lean: dark olive-gray (2.5Y 3/2; almost neutral) and some dark brownish-gray (10YR 3/3-2/2). <u>Very</u> faint slightly irregular and distorted laminations. Slightly irregular medium to thin shaly parting; hackly fracture.
1762.4	1764.3	Oil shale, medium: dark to rare light brownish-gray (10YR 3/2-2/2, some 4/2-6/3, rare 7/3), rare resinous to waxy luster near top. <u>Very</u> faint and some fairly distinct, smooth to irregular and distorted laminations. Regular to irregular, thick to thin shaly and rare papery parting; irregular to hackly fracture; some are slightly elastic.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1777.7	1779.3	Oil shale, very lean: medium to dark gray (5.5-3.5N) with common medium to dark brownish-gray laminae (10YR 5/2-3/2). Irregular distorted and some contorted laminations. Regular to very irregular, thick to medium parting.
1779.3	1787.5	Marlstone, silicic: light to medium gray (6.5-4.5N) and some light brownish-gray (10YR 6/2-7/2). Very irregular distorted to contorted and folded laminations, bands, and stringers. Regular to very irregular thick parting; some very irregular fracture. Most of the section is cut by a smooth vertical fracture with resinous brown coatings. A 0.3-foot band of finely laminated medium to dark brownish-gray (10YR 5/2-2/2) oil shale at 1781.7-1782.0 feet.
1787.5	1789.5	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2-3/3). Very faint, fine, smooth to distorted and rare slightly contorted laminations. Very regular to slightly irregular, medium to very thin shaly and rare papery parting; hackly fracture; elastic and tough. Very rare, very fine vitreous black organic streaks. Very rare patches of fine buff specks on parting surfaces (1787.7 feet).
1789.5	1790.2	Oil shale, medium: medium to dark brownish-gray (10YR 4/3-3/2, rare 2/2 and 5/3). Fine smooth to irregular and distorted laminations; very rare poorly formed loop structures (one at 1790.1 feet has small irregular gray crystalline lens inside loop). Very regular to irregular, medium to thin shaly parting; hackly fracture; elastic and tough. Very rare olive-green (fine pyrite) and black (organic) plant fossils (?) on parting surfaces. Rare thin to fine buff tuff stringers and lenses.
1790.2	1790.6	Oil shale, very rich: brownish-black and some dark brownish-gray (10YR 1/2, some 2/2), rare resinous luster. <u>Very</u> faint, very fine smooth laminations. Very regular to slightly irregular, thick to very thin shaly and rare papery parting; hackly fracture; slightly elastic.
1790.6	1791.0	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2; almost neutral). Faint smooth to slightly distorted and rare displaced laminations. Very regular thick to thin shaly parting; very slight hackly fracture. Common very fine buff to gray specks on some parting surfaces.
		Sample of shale with buff to gray specks on some parting surfaces from 1791.0 feet:
		X-ray - quartz, illite; some pyrite, feldspar, analcite.
1791.0	1801.0	Missing.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1809.2	1810.8	Oil shale, rich: dark brown and dark to rare medium brownish-gray (10YR 3/4 and 3/2-2/2, rare 4/2-5/2). <u>Very</u> faint distorted to smooth streaked bedding and rare laminations. Very irregular thick to medium parting; very irregular fracture. Rare dense brown dolomite streaks and lenses with pyrite. Some dark olive-green silty patches on parting surfaces.
1810.8	1813.7	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2; some almost neutral), very rare resinous luster. Faint to very faint, smooth to irregular and slightly distorted laminations. Regular to irregular, medium to thin shaly and some papery parting; hackly to irregular fracture. An irregular 1-inch band of dark gray silty material with thin buff crystalline stringers at top (buff stringers consist of fine matted needles or fibers). Sample of dark gray silty band with buff crystalline stringers from 1810.8 feet: X-ray - dawsonite, pyrite, feldspar; some quartz.
1813.7	1815.1	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/3), common resinous to waxy luster. <u>Very</u> faint smooth to irregular and distorted laminations; rare displaced laminae and loop structures. Very regular and some irregular, medium shaly to papery parting; hackly fracture; some are very elastic and tough. A very irregular thin stringer of brown to buff oil-stained tuff at 1814.4 feet. Sample of oil-stained tuff stringer from 1814.4 feet: X-ray - analcite, feldspar, dawsonite, quartz.
1815.1	1816.8	Oil shale, rich: dark brownish-gray (10YR 3/2-2/2). <u>Very</u> faint smooth to slightly distorted laminations and streaked bedding. Regular to slightly irregular, thick to thin shaly parting; irregular to slightly hackly fracture. Some thin laminae and irregular stringers of brown prismatic calcite. Rare very small dark brown to black resinous lenses.
1816.8	1817.8	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2), rare resinous luster. Very faint smooth to slightly distorted laminations and streaked bedding. Very regular to slightly irregular, thick to very thin shaly parting; hackly fracture. Very common thin stringers to fine streaks of brown prismatic calcite at 1817.0 to 1817.4 feet.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1821.7	1822.3	Oil shale, rich or medium: dark brownish-gray (10YR 2/2-3/2). Very faint slightly irregular and distorted laminations. Regular to slightly irregular, thick to thin shaly parting; hackly fracture; some very elastic and tough. Some thin brownish-black resinous chert lenses and stringers.
1822.3	1823.5	Oil shale, rich, or very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2), some resinous to waxy luster. <u>Very</u> faint irregular and distorted to smooth laminations. Very regular to slightly irregular, thick to very thin shaly parting; some hackly fracture; very elastic and tough. Some thin dark brown resinous chert stringers. Very rare fine pyrite stringers. Very rare black fossil fragments on parting surfaces.
1823.5	1824.8	Oil shale, medium: dark and rare medium brownish-gray (10YR 3/2-2/2, rare 4/2), some very fine resinous to waxy streaks. Very faint distorted to smooth streaked bedding and rare laminations. Very regular to irregular, thick to very thin shaly parting; some hackly fracture; some elastic and tough. Some dark greenish-gray silty pyrite patches on parting surfaces.
1824.8	1825.5	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/3), common resinous to waxy luster. Faint irregular distorted laminations; some loop structures. Regular to irregular, thick shaly to papery parting; hackly fracture; very elastic and tough. Very rare small massive pyrite lenses.
1825.5	1826.0	Tuff and some rich oil shale: dark brownish-gray and rare brownish-black (10YR 2/2, some 3/2-3/3, rare 1/2), earthy to dense crystalline, bitumen impregnated. Very irregular and contorted stringers. Irregular parting and fracture. Dark brownish-gray to brownish-black contorted oil shale above and below; some interfingering stringers at top. Some fine very light buff chalky stringers in tuff. (Pieces of contorted shale at base fit together like "curly bed" with some glossy parting surfaces and olive-green silty crusts.) Sample of dark brownish-gray and buff tuff from 1825.6-1825.9 feet: X-ray - analcite, mixed layer clay; some feldspar, quartz
1826.0	1826.9	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-3/2, rare 2/2). Very faint irregular, slightly distorted and displaced laminations. Smoothly curved to regular flat, medium to thin parting; very coarse hackly fracture. Rare crystalline pyrite streaks. Some olive-green coatings on parting surfaces. Uneven sample split.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1835.2	1836.8	Oil shale, very rich to rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), some resinous to waxy luster. <u>Very</u> faint slightly irregular and distorted to smooth laminations; some loop structure near top. Regular to slightly irregular, papery to thin shaly parting; hackly fracture; very elastic and tough. Very rare diagonal shear surfaces with resinous luster. Very rare fine brown dolomite stringers.
1836.8	1838.0	Oil shale, rich or very rich: dark brownish-gray to brownish-black (10YR 3/2-1/2), some resinous luster. Faint to <u>very</u> faint, irregular and distorted to fairly smooth laminations; some loop structures. Regular to slightly irregular, thick to thin shaly parting; some hackly fracture. A 0.1-foot dark brownish-gray dolomite band at base.
1838.0	1838.9	Oil shale, very rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), common resinous to waxy luster. Irregular distorted to smooth laminations; common loop structures near top. Slightly irregular to very regular, papery to medium shaly parting; hackly fracture; elastic and tough. Very rare olive-gray silty pyrite crusts on parting surfaces. Rare glossy shear surfaces with slickensides.
1838.9	1839.9	Oil shale, medium, tuffaceous (?): dark brown to dark brownish-gray (10YR 3/4-3/2, rare 2/2), rare resinous to waxy luster. Very irregular and distorted streaked bedding. Irregular parting and fracture; elastic and tough. Rare fine tan to buff specks and streaks. Some olive-gray silty pyrite crusts on parting surfaces and irregular fractures. A large very irregular dark brown, spongy to dense crystalline lens at 1839.4 feet. Sample of dark brown lens from 1839.4 feet: X-ray - quartz; some pyrite.
1839.9	1842.3	Oil shale, medium: dark brownish-gray (10YR 3/2-2/2; some almost neutral). <u>Very</u> faint smooth laminations and streaked bedding. Very regular to slightly irregular, papery to medium shaly parting; hackly fracture; some very elastic and tough. Some fine brown crystalline calcite (?) streaks at 1840.4 to 1840.6 feet. <u>Very</u> rare ostracode (?) fragments and small vertebrate fossils.
1842.3	1845.0	Oil shale and silicic marlstone: medium to dark brownish-gray oil shale (10YR 4/2-2/2; almost neutral) with some to very common laminae and rare thick bands of medium to light gray silicic marlstone (4-5.5N). Smooth to slightly irregular and distorted laminations and rare bands.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1852.2	1853.0	Oil shale, lean: medium to dark brownish gray (10YR 4/2-3/2). Irregular distorted and some contorted and displaced laminations. Irregular medium to thick parting; irregular fracture. Common black fossil fragments (some fish ribs?) and rare small black organic lenses. Uneven sample split.
1853.0	1854.0	Missing.
	Core 22	
1854.0	1855.6	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2), some resinous to waxy luster. Very faint slightly irregular and distorted to smooth laminations. Irregular to very regular, medium to thin shaly parting; hackly to irregular fracture. Rare large lenses (up to 1- x 3/4-inch) of resinous black organic material. Rare very irregular pyrite stringers and lenses. Some yellowish-buff earthy lenses and stringers at 1855.4 feet. Sample of shale with yellowish-buff stringers from 1855.4 feet: X-ray - mixed layer clay; some ferroan, analcite, dawsonite.
1855.6	1857.7	Oil shale, rich to medium: dark to rare medium brownish-gray (10YR 2/2-3/2, rare 4/2). Very faint to faint, smooth to slightly distorted laminations. Irregular to regular, thick to thin shaly parting; coarse hackly to irregular fracture. Rare small black organic lenses.
1857.7	1858.2	Oil shale, rich to medium: dark brownish-gray to brownish-black (10YR 2/2-1/2). Very faint smooth laminations. Slightly irregular to very regular, medium to thin shaly parting; coarse hackly fracture. Rare very fine black fossil (?) fragments on parting surfaces. Rare black organic lenses.
1858.2	1861.2	Oil shale, medium and lean: dark brownish-gray (10YR 3/2-2/2; some slightly neutral) and some dark to medium olive-gray (2.5Y 3/2-4/2). Very faint smooth to slightly distorted laminations and streaked bedding. Very regular to some very irregular, thick to thin shaly parting; coarse to slight hackly fracture. Rare black fossil fragments on parting surfaces. Rare small black organic lenses. A 0.1-foot zone of dense medium to dark brownish-gray irregular distorted crystalline stringers at 1859.2 feet.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
1885.1	1886.3	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2, rare 5/2 and 2/2; some slight olive tint). Faint smooth to slightly irregular and distorted laminations. Regular to very irregular, thick to thin shaly parting; coarse hackly to very irregular fracture. Rare olive-green silty pyrite crusts on parting surfaces. Very badly broken up; uneven sample split.
1886.3	1887.3	Oil shale, lean to medium: dark and rare medium brownish-gray (10YR 3/2-2/2, rare 4/2). Faint to very faint, slightly irregular and distorted to smooth laminations. Irregular to very regular, thick to thin shaly parting; irregular to coarse hackly fracture. Some very glossy shear surfaces with slickensides.
1887.3	1888.8	Oil shale, rich: brownish-black to dark brownish-gray (10YR 1/2-2/2). <u>Very</u> faint smooth to irregular and distorted laminations. Regular to slightly irregular, thick to thin shaly parting; coarse hackly to irregular fracture. Some thick irregular brownish-black silty bands in lower half. Rare very glossy shear surfaces with slickensides. Very rare black fossil fragments on parting surfaces. Sample of thick brownish-black silty band from 1888.2 feet: X-ray - unidentified mineral; possibly analcite, quartz, ferroan.
1888.8	1891.0	Oil shale, medium: dark brownish-gray (10YR 2/2-3/2), silty crystalline texture. Smooth to slightly distorted streaked bedding and some laminations. Regular to irregular, thick to thin shaly and rare papery parting; hackly to irregular fracture; some elastic and tough. Rare small gray pyritic lenses and streaks.
1891.0	1893.6	Oil shale, medium or rich: dark brownish-gray and rare brownish-black (10YR 2/2, rare 1/2). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to regular thick shaly parting; irregular to hackly fracture. Some small to large dense dark brownish-gray lenses.
1893.6	1898.7	Oil shale, lean to very lean: dark brownish-gray (10YR 3/3-2/2; some almost neutral) and gray (4-5N). Faint distorted streaked bedding to massive. Very irregular fracture and parting. Badly broken up and mixed up; grab sampled. (Orange marker at 1893.6 feet?)
1898.7	1902.0	Missing.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Equity Oil Company's Sulphur Creek No. 10 well (Con.)

From	To	Description
Core 25		
2204.0	2205.0	Mudstone: light gray (6-7N) and some buff-white (10YR 8/2), very calcareous, massive. Very badly broken up into small irregular chunks; grab sampled.
2205.0	2207.6	Siltstone: medium to light gray (5.5-7N), calcareous, massive. Very irregular fracture.
2207.6	2208.6	Siltstone and mudstone: medium to light gray (4.5-6.5N), slightly calcareous. Very irregular distorted stringers to massive. Very irregular fracture; uneven sample split.
2208.6	2209.8	Siltstone and very fine sandstone: medium to light gray (5.5-6.5N), calcareous. Irregular distorted stringers to massive. Very irregular fracture.
2209.8	2212.5	Sandstone, very fine to fine grained: light to medium yellowish-brown (2.5Y 7/4-5/4), slightly calcareous, oil stained. Massive to some very faint streaked bedding. Irregular to fairly smooth fracture.
2212.5	2214.3	Siltstone: light to medium gray (6.5-5.5N), calcareous. Very faintly bedded to very irregular and distorted stringers. Very irregular fracture and some irregular parting.
2214.3	2214.9	Mudstone: light to dark gray (7-3.5N), slightly calcareous. Very irregular contorted stringers. Irregular to slightly hackly fracture.
2214.9	2216.4	Sandstone, very fine to medium grained: light yellowish-brown (2.5Y 7/4-6/4). Massive to some very fine inter-lacing black stringers and some dark angular shale inclusions.
2216.4	2217.2	Mudstone and siltstone: medium to light gray (4-6N), calcareous. Very faintly bedded to massive. Very irregular fracture. Badly broken up; uneven sample split.
2217.2	2221.5	Siltstone and very fine sandstone: light gray (7.5-6N), slightly calcareous. Very faint slightly distorted streaked bedding.
Bottom of sampled section		
2221.5	2231.0	Mudstone, siltstone and sandstone: light to medium gray (7-4N) and some light yellowish-brown (2.5Y 7/4-6/4). Massive to very irregular and distorted streaks and stringers. Very irregular fracture.
2231.0	2237.6	Mudstone: dark to medium gray (3.5-5.5N) and some light yellowish-gray (2.5Y 7/3). Distorted streaked bedding and some contorted and broken laminations. Some thick massive bands of yellowish-gray mudstone. (No oil in test tube.)
		Sample of yellowish-gray mudstone from 2233.5 feet: X-ray - siderite; some quartz, feldspar.

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