OKLAHOMA GEOLOGICAL SURVEY
OPEN-FILE REPORT 3-2006

Asphalts, Asphaltites and Asphaltic Pyrobitumens in Oklahoma

("The Goodrich File")

by

Harold B. Goodrich
(employed by the USGS in 1943-1944 to do a study of the nature, distribution, and geology of asphalt and tar sand deposits of Oklahoma)

with additions by

Louise Jordan, Oklahoma Geological Survey, 1963-1964

This document has been xeroxed from notes kept on 3 x 5 index cards in a file begun by Harold Goodrich in 1943-1944 and added to by Louise Jordan in 1963-1964. His notes are typewritten; hers are handwritten. The notes include:

- bibliographic references to asphalts in general and asphalts in Oklahoma
- regional (NE, SE, SW, NW) locality data for Oklahoma
- locality data by county for 35 Oklahoma counties

See OFR 2-2006 and GM-8 for related information.

NEW

not on June 1964

list for OGS map

(1-23) COUNTY COMANCHE SEC 21-2N-10W
FIELD LAWTON DIST. Result OIL LOC C SW NW SW NE
OPER. D. L. GLENN
WELL# 6 FARM FULLERTON COMP 1-7-65

SPD 8-24-64, NO SURF CSG.
TD 946 RATHMAN 923, 4½" - 931' - 125SX;
PERF 12/907-12, 8/881-85, 20/846-56, 12/754-60
WTRFRAC 2# X 4.2 PERFS 754-912 (OA)
CONGLOMERATE IP PUMP 22 BO/24HRS, GVTY 34°,
PAY 754-912 (OA)
TD 946

CONGLOMERATE PROD.

ELEV —
ELECT LOG TOPS:

OIL SD	394
CONGL	750
CONGL	780
CONGL	820
CONGL	853
CONGL	879
CONGL	910
TD	946

COUNTY COMANCHE SEC 29-2N-10W
FIELD LAWTON DIST Result OIL LOC NE SW SE
OPER. D W BECK
WELL# 15 FARM BOWMAN COMP 1-21-65

GENE MINDERMAN
SPD 10-15-64
TD 979 - NO ELECT LOG 4½" - 968 - CMT;CIRC
PERF 3/944-50 12/952-56 21/957-64
SNDFRAC 3,000# X 3,000 OIL
CONGLOMERATE IP PUMP 10 BO + 4 BW/24HRS
GVTY 34
TD 797

CONGLOMERATE PROD

ELEV 1234 GR

CONGLOMERATE	819
CONGLOMERATE	920
TD	979

(1-25) COUNTY COMANCHE SEC 17-3N-10W
FIELD ~~FT. SILL~~ Result OIL LOC C SW NW NE SE
OPER. G & G WELL SERVICE
WELL# 1-A FARM KING COMP 1-7-65

COMPANY TOOLS
SPD 9-12-64, NO SURFACE CSG
TD 1057 RATHMAN, OIL SD 903, 4½" - 1006' - 135SX;
PERF 20/908-18
SANDFRAC 2.5# X 3.2 PERFS 908-18, REC LD, (OIL SD)
IP FLOW 168 BO/24HRS, TC FTP ? SITP 350# PAY
908-18
TD 1057

OIL SAND PROD.

ELEV —
NO TOPS CALLED
TD 1057

(1-26) COUNTY KIOWA SEC 15-6N-17W
FIELD KOMALTY DIST. Result OIL LOC NW NE NE
OPER. MID-AMERICA OIL COMPANY OF OKLAHOMA, INC.
WELL# 11-B FARM WEIGANDT COMP 1-7-65

OLAN TYSON (RT)
SPD 10-14-64 8-5/8" - 65' - 15SX;
TD 780 NO ELECT LOG 5½" - 762' - 30SX;
CONGLOMERATE IP PUMP 36½ BO/24HRS, GVTY 34
PAY 762-780 OH
TD 780

CONGLOMERATE PROD.

ELEV. ---
CONGLOMERATE 762
TD 780

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(4) COUNTY CARTER SEC 20-4S-1W
FIELD S. E. KELLER Result D&A LOC C SW SW SE
OPER. CALIFORNIA OIL COMPANY
WELL# 2 FARM J. L. PRICE UNIT COMP 12-22-64

T & O DRILLING COMPANY
SPD 6-27-64 9-5/8" - 35 - 2½ YDS;
CORE 482-502, REC NOT RELEASED
CORE 510-596, REC NOT RELEASED
CORE 618-638, REC NOT RELEASED
CORE 638-654, REC: 13' SD, W/SLI STN & ODOR
TD 710 ELECT LOG: SD, WO ORDERS
D&A
DRY AND ABANDONED

ELEV. ---
NO TOPS CALLED
TD 710

(12-143) COUNTY COMANCHE SEC 5-2N-10W
FIELD S. FT. SILL Result D&A LOC SW SW NW SE
OPER. W. E. STOUT
WELL# 2 FARM KIRKLAND COMP 12-17-64

M & S DRILLING COMPANY
SPD 5-16-64 NO SURFACE
TD 1098 RATHMAN LOG;
PERF 48/434-38 WTRFRAC 3.1# X 4.7
NO RECOVER LOAD.
TD 1098

ELEV. ---
ELECT LOG TOPS:
OIL SD 433
TD 1098

(12-144) COUNTY COMANCHE
FIELD S. FT. SILL Result OIL
OPER. W. E. STOUT
WELL# 3 FARM KIRKLAND "A"

SEC 5-2N-10W
LOC NE NE SW SW
COMP 12-17-64

M & S DRILLING COMPANY
SPD 8-28-64, NO SURFACE
TD 1053 RATHMAN LOG $4\frac{1}{2}$" - 600' - 60SX;
PERF 16/584-88, 68/570-87 SANDFRAC 5 X 5
OIL SAND IP PUMP 3 BO + 3 BSW/24HRS, GVTY 36
FROM PERFS 570-88 OA
TD 1053

OIL SAND PROD.

ELEV --
ELECT LOG TOPS:
OIL SAND 570
TD 1053

COUNTY COMANCHE
FIELD LAWTON DIST Result OIL
OPER. D W BECK
WELL# 15 FARM C C SHULL

SEC 29-2N-10W
LOC SE NW SW
COMP 1-21-65

GLEN MINDERMAN
OWDD: OTD 300' 7" - 300 - CMT; WAS BORDMAN
OIL COMPANY, D&A IN 1948
NEW INFO: RE-SPD 11-1-64 DD TO TD 967 NO LOGS
RUN; $4\frac{1}{2}$" 898 - CMT TO SURF
PERF 12/807-811 12/821-825
SANDFRAC 3,000# SD X 3,000 OIL
CONGLOMERATE IP PUMP 12 BO + 6 BW/24HRS GVTY
34 PERFS 807-25 OA
TD 967

CONGLOMERATE PROD

ELEV 1230 GR
CONGLOMERATE 804
TD 967

(11-28) COUNTY COMANCHE
FIELD LAWTON DIST. Result OIL
OPER. W H TATGE
WELL# 5 FARM SCHOOL LAND

SEC 17-2N-10W
LOC C W/2 SE SE
COMP 11-12-64

SPUD 6-16-64; NO SURF CSG
TD 906 - ELECT LOG 905; $4\frac{1}{2}$" - 904 - 140SAX;
PERF 18/851-60, 4/890-92
SF 3# X 5.7
CONGLOMERATE IP PUMP 35 BO/24 HRS, PERFS 851-892 OA

CONGLOMERATE PRODUCTION.

ELEV 1212DF
ELECT LOG
CONGL 851 +361
TD 906 +306

4

V

COUNTY STEPHENS
FIELD LOCO DIST. Result OIL
OPER. PARAMORE OIL COMPANY
WELL# 6 FARM JACKSON

SEC 17-3S-5W
LOC C NE SW SW NE
COMP 11-26-64

LINCO DRILLING CO. (RT)
SPD 7-15-64; 7" - 87' - 100SX;
TD 495 - NO LOG 2-7/8" 493' - 35SX;
PERF 20/460-65
LOCO SND - IP PUMP 2 BO + 2 BSW/24HRS, GVTY 21 (OIL WELL FROM WTR FLOOD)
PERF 460-65.
TD 495.

LOCO SAND PROD.

ELEV	---
LOCO SAND	460
TD	495

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

Seminole Co.
Conrad & Cook Inc. #1 Akers-Reed CNNNWSW 31-6N-8E
elev. ——
29 Grav.

Stevens
Coastal States Gas Prod. Co. #4 Dennis CSWSESW-32-2N-5W
elev. 1194 GR (Triple Completion)
19.8 grav. - Dorn. H.
27.5 grav - Markham

5

Carter Co.
Tepaco #9 Pennington R. 1-E C E/2 E/2 NE 16-1S-3W
elev. 996 DF
26 Grav.

Carter
Keith F Walker #9 Tolbert C SW SE NW NW 26-2S-2W
elev —
26 Grav.

Stephens Co.
W.L. Cornish & J.E. Kendrick #1 Fred Schiefer C SW NE 12-2S-5W
elev —
24 Grav.

Murry Co

Crowe Oil Co #GMC #1 Burnside SWSESE 24-1N-2E
elev, 1002 KB
19 Grav.

Murry Co

Jess Spring, Jr. #1 Ferguson CSWNESW-21-1N-2E
elev 915
20 Grav.

7

Northwest

(10-275) COUNTY CARTER

FIELD SHO-VEL-TUM Result OIL

OPER. MELTON OR EFFIE GRIFFIN

WELL# 9-B FARM CARRS

SEC 34-3S-2W

LOC C SE NW NE SE

COMP 10-28-65

BLONDELL DRLG (RT)
SPD 8-20-65 NO SURF CSG
TD 954 - E LOG: 7" - 928' - 150SX
PERF (OIL CITY SD) 32/888-96
OIL CITY SD - IP PUMP 2 BO/24HRS GVTY 23
(PAY 388-96)
TD 954

OIL CITY SAND PROD

ELEV

ELECT LOG TOPS:
OIL CITY SD 886
TD 927

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

COMANCHE
H. A. HACKATHORN — C SE NW SW SE — 16-2N-10W
4 SCHOOL LAND-ODEGARD — OIL — LAWTON DIST.
7-30-64

SPD 4-27-64; NO CORES OR TESTS; 4½" 1030;PERF 10/921-26; 2/943-44;FRAC;CONGLOMERATE-IP F/72 BO/24HRS 3/32"TC;TD 1047
TOPS; ELECT LOG; ELEV ---; CONGLOMERATE 876-84;891-98; 920-37;941-50;980-94;1013;TD 1047.

CONGLOMERATE PROD.

COMANCHE
D.L. GLENN — C SW SE NW NE — 21-2N-10W
4 JOE FULLERTON — OIL — LAWTON DIST.
6-25-64

SPD 4-16-64;4½" 980';PERF 10/938-43;FRAC; CONGLO-IP PUMP =/& F/65 BO/24HRS 3/4"TC TD 1030.
TOPS; ELECT LOG; ELEV ---; CONGLOMERATE 938;TD 1030.

CONGLOMERATE PROD.

COMANCHE — C NE NE NE SW — 27-2N-10W
MELVIN HUFFAKER — OIL — LAWTON DIST.
1 1ST CHURCH OF CHRIST SCIENTIST
7-30-64

SPD 5-20-64; 4½" 1200';PERF 16/997-1005;FRAC; CONGLOMERATE IP F/72 BO/24HRS 8/64"TC;TD 1200;
TOPS; ELECT LOG; ELEV ---; CONGLOMERATE 592-612;774-89;842-850; 909-914;995-1005;1058-70;1087-1113;1121;TD 1200.

CONGLOMERATE PROD.

STEPHENS
ELMON ROY OF ELMON OIL CO. SW NE SW SE — 12-1N-4W
4 HARRELL — OIL — WILDCAT
8-6-64

SPD 5-15-64; NO SURF CSG; 4½" 585'/PERF 20/556-64;PERMIAN IP PUMP 2 BO + 2 BSW/24HRS TD 585.
TOPS;ELECT LOG; ELEV ---; PERMIAN 470;PERMIAN 556;TD 585.

PERMIAN SAND PROD.

CARTER
LINCOLN ROCK CORPORATION   C SW SW SE NE 34-3S-2W
6 O'CONNOR   OIL   SHO-VEL-TUM
7-23-64

SPD 5-13-64;NO SURF CSG; 4½" 924';PERF 32/586-876;FRAC;
PERMIAN SD-IP PUMP 5 BOPD/24HRS TD 925.
TOPS: ELECT LOG; ELEV ---; PERMIAN SD 868;TD 925.

PERMIAN SAND PROD.

COMANCHE
DARRELL SMITH   C SE NW SW NW   32-2N-10W
1-A EAGLE   OIL   LAWTON DIST.
7-23-64

SPD 4-22-64;NO SURF CSG; 4½" 1018';PERF 6/872-78;2/850-52;
4/842-46;826-30;SWB 2 BOPH/NT;FRAC;LIMY SD-IP PUMP 2 BOPD/24
HRS TD 1021.
TOPS:ELECT LOG; ELEV ---; LIMY SAND 826;842;850;872;930;950;
TD 1021.

LIMEY SAND PROD.

Stephens   30-1N-5W
H.G. Gray #6 McManus   C NE SE NW SW 30-1N-5W
elev --   TD 1004
GRAV 26   Hoxbar

(10-201) COUNTY COMANCHE SEC 17-2N-10W
FIELD LAWTON DIST Result OIL LOC C SE SE SW SE
OPER L W MONZINGO
WELL # 12 FARM CAPSHAW-STATE COMP 10-21-65

ELEV

DC/GENE MENDERMAN DRLG (RT)
SPD 8-11-65 NO SURF CSG
TD 930 - RATHMAN 4½" - 920' - 120SX
PERF (CONGL) 6/905-908
CONGLOMERATE IP PUMP 8 BO/24HRS GVTY 24
(PAY 905-908)
TD 930

CONGLOMERATE PROD

This is doubtful
off set says 34°

ELECT LOG TOPS:

CONGLOMERATE	815
CONGLOMERATE	890
TD	930

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

Comanche

17-2N-10W
C SE SE NE SE
Also in Sec 21

W.G Craig 1 School Land
Perf. 881-87, 939-49'

IP 7 BOPD Grvty 35°

Stephens

12-1N-4W
SW NE SW SE

Elmon Oil Co
4 Harrel

IP 2 Bo + 2 BSW/day Grvty 22
pay 556-64' Permian ss
TD 585

COMANCHE
L. W. MONZINGO C SE NWSW SE 17-2N-10W
6 CAPSHAW-STATE OIL LAWTON
9-17-64

SPD 7-31-64; $4\frac{1}{2}$" 970; PERF 12/932-938;CONGLOMERATE- IP F/24 BO/24 HRS 10/64"CC; TD 1307.
TOPS; ELECT LOG; ELEV --- ; CONGLOMERATE 798;930;TD 1037.

CONGLOMERATE PROD.

COMANCHE
FRANK A. HOLLIS, ET AL NW SE NW 21-2N-10W
8 GLASGOW OIL LAWTON DIST.
10-8-64

SPD 6-8-64; NO SURF CSG; $4\frac{1}{2}$" 903';PERF 8/859-63;16/872-80; FRAC;PUMP 50 BO/24HRS;CONGLOMERATE IP PUMP 35 BO/24HRS; TD 905.
TOPS; ELECT LOG; ELEV ---; CONGLOMERATE 858; CONGLOMERATE 870; TD 905.

CONGLOMERATE POR.D

COMANCHE
MELVIN HUFFAKER C SE SE SE NW 27-2N-10W
1 R. B. PRICE OIL LAWTON DIST.
10-8-64

SPD 7-9-64; NO SURF CSG; $4\frac{1}{2}$" 1090'; PERF 12/980-86;970-76; FRAC; GRANITE WAS-IP F/55 BO/24HRS 8/64"TC; TD 1090.
TOPS;ELECT LOG; ELEV ---; CONGLOMERATE 862; GRANITE WASH 970 GRANITE WASH 980; TD 1090.

GRANITE WASH PROD.

COMANCHE
MELVIN HUFFAKER C NW NW NW SE 27-2N-10W
1 IRENE WILLIAMS OIL LAWTON DIST.
10-8-64

SPD 7-18-64; NO SURF CSG;$4\frac{1}{2}$" 1100';PERF 14/977-84;16/964-72 FRAC;GRANITE WASH-IP F/40 BO/24HFS 8/64"TC;TD 1100.
TOPS;ELECT LOG; ELEV ---; GRANITE WASH 964;977; TD 1100.

GRANITE WASH PROD.

Comanche 32-2N-10W
CSENW SWNW

Darrell Smith
1-A Eagle
1964

perf 872-78, 850-52, 842-46
826-30 IP PP2 BOPD
Gravity 28 826-878
lmy sd pord. TD1021

COMANCHE
L. W. MONZINGO
5 CAPSHAW-STATE
10-1-64

C SE SE NW SE 17-2N-10W
OIL LAWTON DIST.

SPD 5-31-64; NO SURF CSG; 4½" 971/PERF 12/926-32; FRAC;
CONGLOMERATE-IP F/20 BO/24HRS 10/64"TC, TD 981.
TOPS; ELECT LOG; ELEV ---; OIL SD 554; GAS SD 463; CONGLOMERATE 750;839;849;926;GRANITE WASH 963; TD 981.

CONGLOMERATE PROD.

Comanche 16-2N-10W
CNESWSW SW
Also #9 CSENW SWSW
12BO/day

Hackathorn
8 School Land - Ruth Irene
6-11-64

New
not on map 6/64

Oil sand 438 to 528 TD
Perf 464-70
IP F10 BO/24 ½"CC, FCP?
Gravity 28°

13

Kiowa
M. L. Hart
3 Ditmars
352-400 granite wash Gr. 38°
IP 8 BOPD.
7/64

(2-129)

CADDO Heavy
WILDCAT Result OIL
PHILIP WILSON ETAL
1 FARM RANDLETT MYERS

SEC 34-5N-12W
LOC C SE SW SE SE
COMP 2-10-66
ELEV

ART WALK DRLG (RT)
SPD 9-10- NO SURF CSG
TD 570 RATHMAN $4\frac{1}{2}$" - 312' - 50SX
PERF (OIL SD) 24/250-56 40/178-88 24/140-46
SWB ... FRAC PERF 140-256
OIL SD ... 50/24HRS GVTY 26 (PAY 140-256 OA)
TD 570
OIL SAND PROD

ELECT LOG TOPS:

OIL SD	140
OIL SD	178
OIL SD	250
TD	570

OKLAHOMA COMPLETIONS
... COMM... SEARCH OIL REPORTS ... EXCHANGE BLDG. OKLA. CITY

KIOWA
M. L. HART
3 DITMARS
7-16-64

(4)
SE SE SW SE
OIL

18-6N-16W
KOMALTY DIST.

SPD 6-1-64; 7" 61; $5\frac{1}{2}$" 352; GRANITE WASH-IP PUMP 8 BOPD/24 HRS
TD 400';
TOPS; ELEV ---; LIME 280; GRANITE WASH 365; TD 400'.

GRANITE WASH PROD.

South west

CARTER
ROCKET OIL COMPANY	NE SW NW NW	19-1S-3W
23 DIXON	OIL	SHO-VEL-TUM
9-17-64

SPD 7-17-64; 8-5/8" 140'; 4½" 1497; PERF 40/1424-1434; SWB 12 BO/4 HRS NAT; PONTOTOC IP PUMP 25 BO/24 HRS TD 1500. TOPS: ELECT LOG; ELEV 979; PONTOTOC 1212;1288;1365; 1420;1466;TD 1500.

PONTOTOC PROD.

JEFFERSON
LONDON GAS COMPANY	C SE SE NE NE	22-3S-5W
16 FEATHERSTON	OIL	LOCO DIST.
9-17-64

SPD 5-15-64; 4½" 277'; PERF 12/160-164;16/223-227;241-245 24/168-174;12/229-232;FRAC;PUMP 1 BO + 1/2 BW/24 HRS; TD 998. TOPS: ELECT LOG; ELEV 869; SHALLOW LOCO SD 160;223; TD 998.

SHALLOW LOCO SAND PROD.

CARTER
ROCKET OIL COMPANY
41 JORDAN
7-9-64

SW SE NW NW
OIL

19-1S-3W
SHO-VEL-TUM

SPD 6-5-64; 8-5/8" 31; 4½" 1523; PERF 24/1498-1504; F/EST 5,000,000 CFGPD; PERF 30/1458-68; 1434-44; SWB 7 BOPH; PONTOTOC
IP PUMP 60 BO/24 HRS TD 1525.
TOPS; ELECT LOG; ELEV 961; PONTOTOC 1080; 1212; 1276; 1434; 1458; 1498; TD 1525.

PONTOTOC PROD.

CARTER
ROCKET OIL COMPANY
40 JORDAN
7-9-64

NE NE SW NW
OIL

19-1S-3W
SHO-VEL-TUM

SPD 6-1-64; NO SURF CSG; NO CORES OR TESTS; 4½" 1509'; PERF 20/1477-82; 46/1433-56; F/NAT 75 BO/24 HRS; PONTOTOC-IP PUMP 70 BO/24 HRS TD 1510.
TOPS; ELECT LOG; ELEV 967; PONTOTOC 1374; 1430; 1476; TD 1510.

PONTOTOC PROD.

19-1S-3W
SWSE NW NW

Rocket Oil Co
41 Jordan

Pay 1434-1468 P60BD gravity 29
Sho-vel-tum

7/9/64

Stephens Co 3-1S-5W

Skelly #10 Bruce Ridley CSENESW -3-1S-5W

elev. 1060

Perf. Tussy (Parks sd) 2617-25

Grav. 27.4

Stephens. 22-1S-5W

NWSWSE MW

Loco area Fog Masters 4 O'Bannon

Perf 196-204 404-12, 514-520

616-630

~~Perf~~ 196-630 Grav 26° Permian sd

CarterCo 20-2S-2W

CSENWNEE

Grant, 28° 6/1965

Jack L Norwood

#3 Baker

Cong 1516 -537 perf 1516-28

~~Bokersd~~ 2136 -1157 perf 2136-46

Carter 21-2S-2W

Dillingham Oil Corp. #5 Noble C NWSWNWNW

21-2S-2W

elev. NA

27 Grav.

Carter 26-2S-2W

NESWNW

Keith Walker

5 Tolbert

1964

Hoxbar IP 28 BOPD Gravity 27

perf 1108-1138

TD 1500

CARTER
KEITH F. WALKER — NE SW NW — 26-2S-2W
5 TOLBERT — OIL — SHO-VEL-TUM
8-6-64

SPD 6-7-64; 9-5/8" 30'; 4½" 1217; PERF 120/1108-1138; FRAC;
HOXBAR-IP PUMP 28 BOPD/24HRS TD 1500.
TOPS: ELECT LOG; ELEV ---; HOXBAR SAND 1104. TD 1500/HOX PROD.

COMANCHE
L. W. MONZINGO
7 CAPSHAW-STATE — C NE SE NW SE — 17-2N-10W
9-17-64 — OIL — LAWTON DIST.

SPD 7-16-64; 4½" 466'; PERF 16/424-432; OIL SAND-IP PUMP 1½
BO/24HRS TD 468.
TOPS: ELECT LOG; ELEV ---; OIL SAND 418; TD 468.

OIL SAND PROD.

26-2S-2W
C SE SE SE
Sho-Vel-tum

Kingery
2 Snuck - Sh[illegible]

Perf. 1105-1210 - Perm sd.
IP 41 pump. Gravity 23.9

at #1 CNWSESE
perf. 660-942 IP 60 BOPD
Gravity 23.9

(2-9) COUNTY STEPHENS Heavy SEC 12-2S-5W
FIELD SHO-VEL-TUM Result OIL LOC C NE NW NW NW
OPER. HEWITT & CHAPMAN
WELL# 5 FARM J W WILSON COMP 2-3-66

COMPANY TOOLS SPD 11-8-65 NO SURF CSG TD 733 NO ELECT LOGS 5½" - 479' - 15SX PERF (OIL SD) 24/416-22 OIL SD IP P/1 BO + 2 BSW/24HRS GVTY 24 (PERFS 416-22) TD 733 OIL SAND PROD	ELEV OIL SD 398 TD 733

(10-274) COUNTY
FIELD SHO-VEL-TUM Result OIL LOC C NE SW NW NW
OPER. MILROY OIL CO
WELL# 35 FARM A N HARLEY COMP 10-28-65

DC/HOWELL FORE DRLG (RT) SPD 7-10-65 NO SURF CSG NO CORES OR TESTS TD 576 SCHL 576 4½" - 568' - 75SX PERF (PERMIAN SD) 28/439.5-466.5 40/378-88 SDFRAC 12.5 X 6.8 PERMIAN IP PUMP 4 BO/24HRS GVTY 24 (PAY 378-466½ OA) TD 576 PERMIAN PROD	ELEV 1067 GR. ELECT LOG TOPS: PERMIAN SD 101 PERMIAN SD 135 PERMIAN SD 236 PERMIAN SD 252 PERMIAN SD 381 PERMIAN SD 439 PERMIAN SD 522 TD 576

(11-169) COUNTY STEPHENS Heavy SEC 9-1S-5W
FIELD SHO-VEL-TUM Result OIL LOC SW SE NE SE
OPER. HARDALE DRLG CO
WELL# 1 FARM REVIERE "B" COMP 11-18-65

DC/CO TOOLS
SPD 7-29-65
TD 1520 SCHL 1520 4½" - 1221' - 325SX
PERF (PONT SD) 40/1101-1111 112/944-972
PONT IP PUMP 16 BO + 4 BSW/24HRS GVTY 26
(PAY 944-1111 OA)
TD 1520

PONTOTOC PROD

ELEV
ELECT LOG TOPS:

PONT SD	422
PONT SD	960
PONT SD	1100
TD	1520

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

(12-116) COUNTY STEPHENS Heavy SEC 5-2S-4W
FIELD SHO-VEL-TUM Result OIL LOC C SW SW SE
OPER. SIGNET DRLG CO
WELL# 1 FARM VAN POSSEN COMP 12-9-65

SPD 11-1-65 NO SURF CSG
TD 506 ROTHMAN 506 4½" - 505' - 30SX
PERF (OIL SD) 40/450-460 250 MCA
OIL SD IP P/24 BO/24HRS GVTY 24 (PERFS 450-460)
TD 506

OIL SAND PROD

ELEV
ELECT LOG TOPS:

OIL SD	405
TD	506

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

(10-275) COUNTY CARTER SEC 34-3S-2W

FIELD SHO-VEL-TUM Result OIL LOC C SE NW NE SE

OPER. MELTON OR EFFIE GRIFFIN

WELL# 9-B FARM CARRS COMP 10-28-65

BLONDELL DRLG (RT)
SPD 8-20-65 NO SURF CSG
TD 954 - E LOG: 7" - 928' - 150SX
PERF (OIL CITY SD) 32/888-96
OIL CITY SD - IP PUMP 2 BO/24HRS GVTY 23
(PAY 388-96)
TD 954

OIL CITY SAND PROD

ELEV

ELECT LOG TOPS:

OIL CITY SD 886
TD 927

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

Northeast

(11-299) COUNTY GARVIN Heavy SEC 26-3N-2E
FIELD NE NAHOLA Result OIL LOC NW SE NE
OPER. KINGERY DRLG
WELL# 1 FARM ELDRIDGE COMP 11-26-65

DC/CO TOOLS
SPD 8-23-65 10-3/4" - 56' - 65SX
TD 2565 - E LOG 5½" - 2561 - 175SX
PERF (2ND BROM) 24/2522-28
(MC KIN) 16/2216-20 PKR @ 2463
MC KINNEY IP F/50 BO/24HRS 20/64"CC FCP ?
GVTY 32 (PAY 2216-20)
2ND BROM IP F/120 BO/24HRS 20/64"TC FTP ?
GVTY 30 (PAY 2522-28)
TD 2565

MCKINNEY & 2ND BROMIDE PROD
"DUAL COMPLETION"

ELEV 1015 DF

ELECT LOG TOPS:

MC KINNEY SD	2216	-1201
2ND BROM	2522	-1507
TD	2565	-1550

OKLAHOMA COMPLETIONS
RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG., OKLA. CITY

(11-299) COUNTY GARVIN Heavy SEC 26-3N-2E
FIELD NE NAHOLA Result OIL LOC NE SW NE
OPER. KINGERY DRLG
WELL# 2 FARM ELDRIDGE COMP 11-26-65

DC/CO TOOLS
SPD 9-1-65 10-3/4" - 60' - 70SX
TD 2568 - E LOG 5½" - 2568' - 225SX
PERF (MC KINNEY-BURNS) 25/2273-78 SF 8 X 8
PERF (2ND BROM) 40/2528-38 TBG & PKR @ 2295
MC KINNEY-BURNS IP F/30 BO/24HRS 1/2"CC FCP ?
GVTY 32 (PAY 2273-78)
2ND BROM IP F/60 BO/24HRS 1/4"TC FTP ? GVTY 30
(PAY 2528-38)
TD 2568

MC KINNEY-BURNS & 2ND BROMIDE PROD
"DUAL COMPLETION"

ELEV 1015 DF

ELECT LOG TOPS:

MC KINNEY-BURNS	2272	-1257
2ND BROM	2522	-1507
TD	2568	-1553

OKLAHOMA COMPLETIONS
RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG. OKLA. CITY

MUSKOGEE
INTER-CONTINENT OIL CORP.
2 MEREDITH NE SE 5-14N-18E
9-24-64 OIL MUSKOGEE

SPD 7-20-64; 8-5/8" 60';4½" 1400'; PERF 24/1254-66;12/1280-86;2/1297-98;6/1300-03;4/1305-07;FRAC; STRAY & MUSK-IP PUMP 14 BO/24HRS TD 1400.
TOPS; ELECT LOG; ELEV ---;STRAY 1252; MUSKOGEE 1276;
TD 1400.

MUSKOGEE & STRAY SAND PROD.

Hughes

8-1N-9E
SWNENW
~~Hedonville~~

~~9/1964 Oliphant / Jarrett~~

~~Calvin 952-968'~~

~~IP 72 BO + 28 BSW~~

Gravity 28°

MUSKOGEE

JOHN K. GILL, ET AL	SE NW SW	9-14N-18E
6-A SEIBOLD	OIL	MUSKOGEE
9-24-64		

SPD 3-1-63; 10-3/4" 100'; 7" 1346; 4½" 1847; JET 1717; 1721;1731;1734;1794 & 1797; 1806;1808;1815;1820;1822; FRAC; STRAY, MUSKOGEE & TIMBER RIDGE-IP PUMP 20 BO/24 HRS; TD 1850.

TOPS; ELECT LOG; ELEV ---; STRAY SD 1708; MUSKOGEE 1742; TIMBER RIDGE 1803; TD 1850.

STRAY, MUSKOGEE & TIMBER RIDGE PROD.
"COMMINGLED"

OKMULGEE

HUGH NEUMEYER	SE NW SW NW	19-14N-15E
2 FLECHS	OIL	BALD HILL
7-9-64		

SPD 4-1-64; 8-5/8" 35'; 5½" LNR 1050-1177/NOT CMTD; FRAC; PUMP 12 BO/24 HRS; BOOCH-IP PUMP 10 BO/24 HRS(OH 1177-1193) TD 1193.

TOPS; ELECT LOG; ELEV ---; BOOCH SD 1175; TD 1193.

BOOCH PROD.

OKMULGEE

GRIMM ENTERPRISES	NW NW SE NW	33-15N-14E
1 LAMONS	OIL	BALD HILL
9-24-64		

OWPB;OTD 1649;OPB 1643; 8¼" 60'/NOT CMTD;6-5/8" 1020/NOT CMTD; 5½" 1624/PUMP 11 BO/24 HRS; NEW INFO;RE-SPD 3-28-63; PERF 20/ 1500-10;FRAC; STRAY SD-IP. PUMP 10 BO/24 HRS TD 1649.

TOPS; ELECT LOG; ELEV ---; STRAY SD 1498; TD 1649.

STRAY SAND PROD.

SE 21 - 1N - 3E

Dried for water 1964

Low gravity 305 Hoxbar?

2 Higher ~~305~~ 319

TD 306

Sheep Creek Pontotoc Co 5-1N-7E SWSESW

IPP: 52 BO + 224 BWPd from Atoka perf. @ 531-612 Aug 11, 1964

Garvin Co. 33-4N-3E NENE SW

Halliburton 1 Dansky

Elev. 1155

perf. 2321-28, Dykeman sd

IP P 2 BO + 3 B SW /24

Gr. 25°

Pontotoc Co. 20-4N-7E
CSW SW

1965 886 DF
McMillin + Johnson Oil Co
#16 Britt
perf @ 1499-1504 29° Gr.

Muskogee 27-16N-15E
CSESESW SE

Bob Shanks et al
7 Lancaster
3-4-65
Oil sd 179-200'
TD 203
IP pump 3 BOPD Gravity 38°

Osage Co 10-21N-8E
SENESW
Tyler
16 Osage

524-531,5
IPP 10 BO - no wtr 24 hrs.

7/64

Osage Co

C M Taylor
#17 Osage

10-21N-8E
SENESW
Osage City fld

Torpedo sd 324 (-411)
to TD 342

5½ @ 300'

OSAGE
C. H. TAYLOR
17 OSAGE
7-23-64

SE NE SW
OIL

10-21N-8E
OSAGE CITY

SPD 6-24-64;7" 100';5½" 300';TD 342.
TOPS: ELEV 735; TORPEDO 324;TD 342.

TORPEDO PROD.

OSAGE
FLORENCE ELLIOTT
34 OSAGE
7-16-64

NW SE NE
OIL

2-21N-9E
E OSAGE CITY DIST

SPD 5-16-64; 5½" 1492; PERF 16/1488-1492;SWB 5 BOPD;PERF 48/
730-742;FRAC;AVANT & L/CLEVE-COMMINGLED-IP PUMP 10 BO + 20
BSW/24 HRS TD 1494.
TOPS;ELECT LOG; ELEV 954; AVANT 730;HOG 1030;LAY 1043;CHBD
1322; JONES 1348; U/CLEVE 1379; L/CLEVE 1488; TD 1494.

AVANT & LOWER CLEVELAND PROD.

OSAGE
FLORENCE ELLIOTT
25 OSAGE
7-16-64

C SW NE NE "TWIN"
OIL

2-21N-9E
E OSAGE CITY

OWODROTD 1381;NO PIPE SET; D&A 5-13-57;NEW INFO:RE-SPD 5-20-64
7" 1485;PERF 60/714-724;PERF 45/1473-1477½;FRAC;AVANT F/EST 500
BSW/24 HRS ;LOWER CLEVE-IP PUMP 10 BO + 5 BSW/24 HRS (PERFS 1473-
1477½)TD 1485.
TOPS;ELEV 942; AVANT 713; CHBD 1303; U/CLEVE 1362; L/CLEVE 1473
TD 1485.

LOWER CLEVELAND PROD.

OSAGE
C.H. TYLER
16 OSAGE
7-16-64

SE NE SW
OIL

10-21N-8E
OSAGE CITY

SPD 5-25-64; 7" 345/NOT CMTD; 5½" 524; SWB SO; BUZZARD-IP PUMP
10 BO + NO WTR/24 HRS NAT; T(OH 524-531½) TD 531½.
TOPS; ELEV 735; BUZZARD SD 526; TD 531½.

BUZZARD SAND PROD.

8-23N-17E

Prod. at 300' Bartlesville

J. J. Poberton
Bx 873
Shawnee, Okla.

~~not on map 7/1/64~~

Craig Co., Okla. 12-25N-21E
?SW SW SE

Water well with film of oil
noted during drought while well was
pumped for 6 months on pipe
& inside casing
J. B. Weedin 4/12/65 + 22/65
2801 Joplin St.
Joplin, Mo.

OSAGE
FINANCE OIL COMPANY
16 OSAGE
7-16-64

SW SE SW
OIL

35-26N-9E
PAWHUSKA

SPD 5-21-64; 10-3/4" 375/NOT CMTD; 8-5/8" 700'; 7" 1230
NOT CMTD;PULLED 10-3/4" & 8-5/8" CSG;BIG LM F/35 BO/24 HRS OPN
7"CSG;BIG LM-IP F/35 BO/24 HRS OPN 7"CSG TD 1532.
TOPS;ELEV 845; BIG LIME 1520; TD 1532.

BIG LIME PROD.

OSAGE
ROY ENDICOTT
1 OSAGE
7-16-64

C NE NE SW
OIL

4-27N-11E
DOMES-POND CREEK

SPD 5-6-64; 7" 19'; 4½" 1204; PERF 116/1136-1186;FRAC; WAYSIDE
IP PUMP 4 BO + 80 BSW/24 HRS TD 1204.
TOPS;ELECT LOG; ELEV 934; CHBD 1099; LENAPAH 1122; WAYSIDE 1136
TD 1024.

WAYSIDE PROD.

OSAGE
F. G. SCANDRETT, ET AL
6 OSAGE
9-17-64

C NE NW SW
OIL

25-27N-11E
DOMES-POND CREEK

SPD 5- 10-64; 10-3/4" 6-5/8" 618;4½" 997;7" 26';FRAC;
WAYSIDE IP PUMP 10 BO + TR. WTR/24 HRS TD 1021.
TOPS; ELEV 915; WAYSIDE 997; TD 1021.

WAYSIDE PROD.

SOUTHEAST

Carter Co.

29-32, 3S-1E
5-4S-1E

Magness Petrol Co. - steam injection
has operations - steam injection Gravity 11-14.6°?
350 to 800'

In Hoxbar, dip 45°
Overlain by Permian 10°

Will do steam process
10 mill. bbls.

(11-83) COUNTY CARTER Heavy SEC 30-3S-1E
FIELD NW DEESE Result OIL LOC C SE SE NE SE
OPER. JIM BACHMAN
WELL# 1 FARM WELCH-BENNETT COMP 11-11-65

PETE LAWRENCE DRLG
SPD 7-26-65 NO SURF CSG
TD 581 - ELECT LOG - $5\frac{1}{2}$" - 581' - 105SX
PERF (HOXBAR) 48/420-440 40/558-572 12/575-578
OIL FRAC 100 BBLS OIL @ 250 DEGREES (NO SD)
HOXBAR IP PUMP 2 BO/24HRS GVTY 16 (PERFS 420-578 OA)
TD 581

HOXBAR PROD

ELEV 805 GR

ELECT LOG TOPS:

HOXBAR SD	420
HOXBAR SD	558
HOXBAR SD	575
TD	581

OKLAHOMA COMPLETIONS

RESEARCH OIL REPORTS
321 COMMERCE EXCHANGE BLDG. OKLA CITY

Bryan Co. SE1/4 31-4S-12E
Asphalt

Along Cowper Creeks in Antlers sd
1 mile N of N-A ranch line house

Larry Olson MS thesis

31

Bryan Co 33-5S-12E
Atoka

10' W of bridge of bridge over
Clear Boggy Creek on south
bank, 2 miles N of Matoy

Larry Olson's MS thesis

Bryan Gas disc. 33-6S-7E

Texaco
1 HS Elliott

perf Cret sd. 798-81
F 301,00 CFG + 8 BW/24
Gas. discovery

B Cret/Atoka 890 -231

TD dev.

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Pontotoc Gets Oil Discovery

Continental Oil Co. completed its No. 1 Stratler in SW SE SW of 5-1n-7e, about 1½ miles southeast of the West Sheep Creek field in Pontotoc County.

Perforated intervals in the Atoka from 546 to 548 feet pumped a final test of 52 barrels of 26-degree gravity oil and 224 barrels of water a day.

Continental drilled the wildcat to 800 feet and set 5½-inch casing at 701 feet.

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32

Bryan Co 33-6S-7E
C SE NE

798-816 IPF 301,00 CFG PD + 8 BWPD from Cretaceous perfs.
Completed 27-VII-64
Named W. Mead field.

Marshall. 1-8S-5E
C NW SW NE NE

1965

Trinity sd 536-540
IP 4 BO + 6 BW/24 Grty 26.8

MARSHALL
BUNCH & BARKLEY SE SW NW NW 25-7S-5E
12 COX OIL ISOM SPRINGS
10-1-64

SPD 8-10-64; NO SURFACE CSG; 7" 340'; WALNUT SND-IP PUMP
4 BO NO WTR/24HRS TD 352.
TOPS: ELEV ---; WALNUT SD 339.

WALNUT SAND PROD

Marshall Co. 25-7S-5E

Bunch + Barkley #1 3 Cox
10-1-64
Walnut sd. perf 346-356
IP pump 3 BO + 10 BFW/12 hrs
Gravity 27°
TD 383

Love Co 28-7S-30E
NWSWNW
SW. Enville

J.O. Martin
1 Askew
1965
Oil sd perf 563-67
swabbed, 1 BO + 300 BSW/24
TD 1100 D+A

Stephens Co 14-2S-4W
CNESESWNE
Sho-vel-tum

Permian sd perf 144/388-424
TD 447

IP 10 BO/24 gravity 23°

F.U. Eby #6 Jameson

Stephens

17-2S-4W
CNWNE NENW

Davenport 2 Moore
IP 2 BOPD Gty 26 perf. 658-666
Pontotoc

Check 17-3S-5W
CNESWSWNE

1965

Frcosd per 460-65 21°
IP 2 BO + 2 BSWPD

38

General references to
Asphalt

OKLAHOMA ASPHALT

Classification of "By Product", or asphalt a refined product from crude oil. These to add to production.

Year	Oil Asphalt	Value
1902	20,826	303,249
1903	46,187	522,164
1904	44,405	459,135
1905	52,369	452,911
1906	64,997	615,406
1907	137,948	1,898,108
1908	119,817	1,540,396
1909	129,594	1,565,427
1910	161,187	2,225,833
1911	277,192	3,173,859
1912	254,344	3,765,506
1913	436,586	4,531,657
1914	360,683	3,016,969
1915	664,503	4,715,583
1916	683,334	6,178,851
1917	701,809	7,734,691
1918	604,728	8,796,541
1919	614,692	8,727,372
1920	700,496	11,985,457
1921	624,220	9,048,221
1922	805,145	10,385,925
1923	995,654	13,060,174
1924	1,158,456	14,305,007
1925	1,206,700	15,305,760
1926	1,245,160	15,452,940
1927	1,304,522	19,019,150
1928	1,321,544	22,060,312

Year	Oil Asphalt	Value
1929	1,582,997	17,103,900
1930	1,403,552	17,895,560
1931	1,274,744	10,855,688
1932	1,062,816	8,591,564
1933	1,192,707	10,675,280
1934	1,444,846	13,073,765
1935	1,801,778	16,141,162
1936	2,327,367	22,355,127
1937	2,804,121	25,478,565
1938	3,068,631	25,948,928
1939	4,636,900	28,172,396
1940	5,346,700	32,534,900

These figures the first time n
need rechecking.

GENERAL.

O.C. Veatch. Graphite in Vein Quartz. Science, 33, (Jan. 6, 1911) P. 38

Graphite was found in massive vein quartz in Troup Co., Georgia. It is of inorganic origin. Small flakes occur in irregular bunches. Under the microscope minute black crystals were noted but the color disappeared upon ignition. This graphite is 2 to 3% of the quartz as exposed. Whether the quartz was deposited from aqueous or aqueo-igneous the carbon must have been held in solution graphite deposited simultaneously with the quartz. Crystalline quartz is evidence of not directly of organic origin is derived from metamorphism of carbonaceous matter. Perhaps the most suggestive theory of the origin of graphite is that it was derived from CO2 or a hydrocarbon vapor held in solution in the siliceous solution.

The presence of CO_2 in quartz crystals is well known. See the quoted by Broadhead, of gas CO_2 98.33%

ASPHALT GENERAL.

E. G. Woodruff, "Natural Asphalt in Use Long before Refined From Crude Oil", Oil & Gas Journal, Mar. 28, 1935, P. 32.

Defines and describes the general usage of Gilsonite of Utah, Pitch Lake asphalt of Trinidad, etc.

A general opinion that asphalt is a residue from an asphalt base crude oil. Probably most of it came this way but there is evidence in some places of its depositio originally as asphalt. If this is true an asphalt deposi does not mean an oil field near at hand. However, becaus of oil seeps in Penn., Drake's well. Paola Kan. and its seepages led to the Mid-Continent; in California and the Star Oil Co., in 1876, drilled into brea; gas seeps at Spindletop induced Captain Lucas to drill. The same story in Mexico, Venezuela, Rumania, etc. There were

failures, due to prior exhaustion.

Asphaltic oils leave abundance of oil where they escape; paraffine oils do not In light oil regions are few surface shows. (Here the author makes possibly misleading statement that there is no seep along the Bartlesville sand outcrop. This may be partly true but see the Cherokee shale seepages though E. Kans., W. Mo., Ark., and N.E. Okla.) But the heavier oils of Healdton have left abundant residue(??)

(The author's history does not go back far enough when he writes of 500 B.C. Abraham cites 5000 B.C.

Statistically U.S. Min. Res. is quoted; 30% of the asphalt used is mined; 70% comes from ref.neries.

P. 49. Oklahoma has a greater number of asphalt deposits and they are distributed over a greater area tha any other region in the world. (Compare this with Barton and his conservative view on importance of seepages in the Mid-Continent) There are 70 known occurrences of asphalt in the S. part of Oklahoma.

(This is made a part of the carrd record as it expresses the personal opinions of one who has studied asphalts in other regions. In part his opinions are not accurate or correct.

ASPHALT GENERAL

E. G. Woodruff, Report on Asphalt Deposits of Oklahoma. E.R.A. of Oklahoma, Dec. 1934, p. 17-22.

APPENDIX.

Tests for Asphalt and Allied Substances.

A-Physical Characteristics.

1- Color of the Mass.

2- Homogeneity.

(a) Homogeneity to the eye at 77 Deg. F.

(1) Soft materials.

(2) Hard and brittle.

(3) Dull indicates - (a) presence mineral matter, (b) Free carbon, (c) Imperfect blending bituminous constituent

(b) Homogeneity under microscope.

(c) Homogeneity when melted.

3- Appearance of surface aged indoors one week.

4- Fracture.

5- Luster

6- Streak on porcelain.

7 Specific Gravity

Methods of test.

(a) Hydrometer

(b) Westphal balance

(c) Specific gravity bottle

(d) Pyknometer.

(e) Analytical balance.

8- Viscosity.

Methods of tests.

(a) Engler.

(b) Hutchinson's tar tester

(c) Hubbard's consitency tester.

(d) Float test.
(e) Scutte consistency tester

9- Hardness or consistency.
Methods of tests.
(a) Moh's hardness scale.
(b) Needle penetrometer.
(c) Consistometer
(d) Susceptibility factor

10- Ductility.
(a) Dow ductility test.
(b) Abrams' ductility test.

11- Tessile strength.

12- Adhesiveness.
Methods of test.
(a) Brown adhesive test.
(b) Osborne adhesive test.

C- Thermal tests.

13- Breaking point.

14- Twist point.

15- Fusing point.
Methods of test.
(a) Kramer Sarnow method.
(b) Ring and ball method,
(c) Cube method.
(d) Compression method.
(e) Melting point of petroleum.
(f) Melting point of paraffine wax.

16- Volatile matter.

17- Flash point.
Methods of test.
(a) Ponsky-Martins closed tester.
(b) Cleveland open tester.
(c) Tagliabue closed tester.

18- Burning point.

19- Fixed carbon.

20- Distillation test.
Method of tests.
(a) Flask method
(b) Evaporation test.

D- Solubility tests.

21- Soluble and insoluble in carbon disulphide
Tests may be:
(a) Insoluble matter to be further examin
(b) " " not" " " "

22- Carbenes.

23- Soluble in 88 Deg. petroleum naphtha.

24- Insoluble in Benzol (Freecarbon).

E- Chemical tests.

25- Water.

Methods of tests.

(a) Substances distilling at low temp.

(b) Substances distilling at high temp

26- Carbon and 27- Hydrogen.

27- Sulphur

28- Nitrogen.

29- Oxygen (in non-mineral matter)

30- Tar acids.

31- Naphthalene in tars.

32- Solid paraffines.

33- Saturated and unsaturated hydrocarbons.

Methods of tests.

(a) Solubility in concent. sulphuric acid.

GENERAL ASPHALT.

Native rock asphalt statistics production un U.S. taken from U.S.G. Min. Res. and U.S. Bur, Mines, Yearbooks. See table.

1882 U.S. Min. Res. P. 605. Bitumen being mined in Cal. and Grahamite was found in W. Va. Some in Colorado. Most of the recorded 3,000 tons from Santa Barbara, Cal. Price of Trinidad $14 per ton. Some 10,000 tons of asphalt were used in paving Washington.

P. 609. Ozocerite was discovered in Utah in 1877. Contained much white wax.

1883 and 1884. Min. Res. Price of asphalt at San Francisco $9.50-$13 per ton.

P. 938. "The Asphaltum Deposits of California" by E.W. Hilgard. In Santa Barbara County "The mineral occurs under conditions pointing to distillation by subterranean heat as the chief factor in consolidation."

"There is nowhere any appearance of stratification--but it seems that the whole had been injected from below as an almost uniform, soft, doughy mass."

1885. Production constant at 3000 tons, value $10,500.

1886. Production native asphalt raised to 3,500 tons, value, $14,000.

1887. Production 4,000 tons, Value $16,000

1888. Refers to river deposits and gilsonite and elaterite. Describes Utah in detail. California prod. liquid asphaltum 4.6 million gallons for paint, varnish, etc.

The first discovery of bituminous rock was at Santa Cruz in 1868 by accident. Man setn to get

ASPHALT GENERAL

George Sell, "Statistics of Petroleum and Allied Substa-
nces of Petroleum (1938) Table 14, p. 29.

Science

Natural Asphalt and Asphalt Rock, In tons.

Year	U.S. Prod.
1901	56,372
1902	75,~~658~~ 568
1903	49,170
1904	57,295
1905	65,090
1906	65,233
1907	76,707
1908	70,148
1909	88,447
1910	88,297
1911	77,745
1912	84,970
1913	82,682
1914	71,329
1915	67,635
1916	87,925
1917	72,861
1918	53,602
1919	78,822
<1920	177,231
1921	264,653
1922	292,668
1923	357,360
1924	502,137
1925	522, 212
1926	638,584

Year	U. S. Prod.
1927	749,179
1928	721,338
1929	717,916
1930	627,510
1931	421,719
1932	303,588
1933	279,634
1934	393,618
1935	310,375

(These figure to be checked with Min. Res. Year Book. Note the great increase in 1920. Why?

ASPHALT GENERAL.

Memo. of a few organizations interested in Asphalt

Allied Material Corp. Cotton Exchange Bldg. Oklahoma City
Anderson-Prichard Oil Co. Ramsey Tower, Oklahoma City.
Barber Asphalt Corp. Barber (Perth Amboy) N.J.
Bell Oil & Gas Co. Tulsa
Ben Franklin Ref. Co. Ardmore!
Gilson Asphaltum Co. Barber, N. J. (See Barber Co.)
Southern Rock Asphalt Co. Oklahoma City (R.D. Farmer)
Ada Rock ASphalt Co. Ada, Oklahoma (C.R. Tipton?)

In 1921 U.S. Min. Res. names of the following:
   Continental Asphalt & Petroleum Co. Okla. City.
   Fort Smith Asphalt Co. Ft. Smith, Ark.
   J. O. Tiptons Ada, Okla. (See C. R. Tipton above)

(b) Sulphonation residue.
(c) Dimethyl suphate test.
(d) Formolite reaction.
(e) Degree of morcuration.

34- Colloidal capacity.
   Method of tests.
   (a) Clay dispersion.
   (b) Elutriation test of sediments.

35- Molecular weight.

36- Unsaponifiable & saponifiable constituents.
   Methods of tests.
   (a) Free acids.
   (b) Lactones and anhydrides.
   (c) Neutral fats.
   (d) Saponification value.
   (e) Separation of Unsap. and Sap. constituents.
   (f) Examination of saponifiable constituents.
   (g) Glycerol.

37- Asphaltic constituents.
   Methods of tests.
   (a) Free asphaltous acids.
   (b) Asphaltous acid anhydrides.
   (c) Asphaltenes.
   (d) Asphaltic resins.
   (e) Oily constituents.

38- Diazo reaction.

39- Anthraquinone reaction.

40- Lbermann-Storch reaction.

P. 922. Asphalt from petroleum (Mabery and F.H. Byerley) sûcceeded in obtaining as residue various grades of asphalt instead of the usual coke by a modification of the final process of distilling the heavier fractions of petroleum. Current of air through pipes into the liquid, the decomposing action of minimized by lowering the rate of distillation. Temperature is first raided to, 450 F; then to 650 F. The distillates divided into two parts both of which are refined for burning oils.

Four products are formed- liquid asphalt, roofing asphalt, paving asphalt, and varnish asphalt; the carbon content varying from 86.22-87.44%, sulphur present 0.3-0.4%, Hydrogen 10.90-9.30, Oxygen 1.9 to 2.40%.

In Oklahoma Territory G. F. Devereaux of the Okla.

Oil and Asphalt Co. reports large bituminous deposits but not developed account of business depression for the past few years.

1897. E. W. Parker. New mines opened in Oklahoma. and Indian Territory added 280 tons production which is included in Texas figures. Productive States Cal. Colo. Tex. Utah, Okla.

P. 194. Indian Territory, Chickasaw Nation. See Oklahoma cards.

to use for flux for harder asphalts. This is extracted by mechanical means from the sands which it saturates. It is not petroleum, but a liquid asphalt. Obtained East of Sta. Barbara. After it is separated consists of more than 98% bitumen making a perfect solvent for the harder asphalts, and this is superior to the petroleum residuum.

1894. E. W. Parker, U.S.G.S. 16th. Ann. Rep't. Asphaltum P. 430 Gross Prod 60,570 Short tons Value $353,400.

Varieties. Describes pure asphaltum and Ls. & S.S. which is impregnated with bitumen.

<u>Occurrences</u>. Particularly mentions Picken Co. Okla. and Montague Co. Tex. Also speaks of "Lithocarbon of Uvalde, Tes.

Production. Increased production due to activity at the bituminous S.S. mines. No bituminous S. S. mines. No. bituminous Ls. was mined.

Table, Hard or gum asphalt 9,790, Value $195,800.
Bituminous rock 50,780 157,600

Productive States Cal, Tex., Ky,, Utah.

1895 E.W. Parker. U.S.G.S. 17th Ann. Rep't P. 751.

Productive States: Cal. Tex., Ky., Utah. The production figures do not include petroleum residue.

U.S. Gross production 68,163, Value $384,281

Refers to Eldridge's paper Part I,17th Ann.

1896 E.W. Parker. Aphaltum, 18th. Ann. Rep't U.S.G.S. P. 919. This year Indian Territory began with reported 12 tons production. This is included with Tex. Productive States Cal., Tex., Utah and Colo.

ASPHALT GENERAL

1891. U.S. Min. Res. E. W. Parker. P. 452. States productive asphalts, Cal. K'y., Utah, California bituminous S.S. companies have pooled their holdings. Difficulties of transportation hold output to a community proposition and sales are limited to competition with Trinidad product in the eastern market. "Lithocarbon" of t technical interest but still undeveloped.

1892. P. 699. Asphaltum is to include all hydrocarbons not belong to the paraffines, hard and liquid, from Cal., K'y., Utah, Texas (No present news of commercial operations of lithocarbon. Uses for asphalt;, street paving, varnishes, paints, insulators, roofing compounds japanning etc. Refers to S. F. Peckham 10th U.S. Census wh classified Cal. bitumen as 1-Do not contain paraffine, do form asphaltum. 2- Contain paraffine, do not form asphaltum (these are petroleums). 3- Those that form asphaltum and contain paraffine.

Hutton prescribes a formula for use of asphalt in paving material: sand, 80%; marble dust, 5%; cement, 15%. "Gum asphalt referred to (gilsonite, Utah)

1893. Asphalt main production comes from California, small amounts from Utah and Kentucky.

P. 627. Technology by Clifford Richardson. Deposi of asphalt in Ohio, W. Va., No. Carolina, Ga., Ala. Tex., Mo., Ky,.Tenn., N.M. Ariz., Wyo, Colo., Utah, Nev., Idaho, Mont., Wash., Cal., Oregon.,I.T.

In 1888 mining of asphalts had begun in Cal. and since then an increased use of asphalt in paving. The discovery in Cal. of a natural bitumen in liquid form redwood blocks and brought bituminous rock by mistake, and this was laid on blocks, as pavement. The next attāmpt in 1876. In 1884 bitumen was hhipped away for paving usage. Used in Los Angeles, San Diego, Santa Barbara, San Bernardino, San Francisoo.

1889 and 1890. During last two years procution on Pacific coast increased price declines.

E. W. Parker author. P. 477. Production limited to Ca ifornia, Kentucky, Utah; small production in Ohio. The latest is "lithocarbon" found W. of San Antonio, Texas. It serves as varnish for metal surface. A company to develop has bean formed, but not started. The deposit a limestone has not been appraised. Bituminous rock producęd in Kentucky.

ASPHALT GENERAL

1900 E. W. Parker. Theproduction this year less than for several years. The maximum was in 1892.

1901. Production increased over 1900. Joseph Struthers author.

1902. J. Struthers. Table of Production. P. 659. Prior to this year the classification of production was different. In 1902 "By product from oil" comes in aād so each year hereafter the figures are gross total, from which is deductible, thus:

Gross	105,458	Short tons,	Value	$755,048
Less	20,826	" "	Less	303,249
Net	84,632	" "		$451,799

1903 J. Struthers. Bituminous S.S. produced in Cal. Ky., Ind. Terr. and Ark.

Gross	101,255	tons	Value Gross	$1,005,446
Less	46, 187	"	Less	522,164
Net	55,068	"		483,282
Indian Terr.	5,107	Tons	Value	28,150

See also Oklahoma cards)

U.S. Min. Res. ASPHALT GENERAL.

1904. E. O. Hovey. States productive; Ky., Ind. Terr (Okla) Ark., Mo., Utah.

Gross	81,572	Value	$903,741
Less	36, 030	Less	376,135
Net	45,542	Net	527,606
Indian Terr'y	6,457		$ 37,516 (Oklahoma)

1905. E. O. Hovey, P. 1161-1162. Describes occurrence; process of slow distillation of crude oil to manufacture asphaltum. Its uses are described; varnishes, roofing and oil-asphaltum in the latter. State producing asphalt are Cal. Ky., Ind.Terr.(Okla),Ark Utah.

Gross prod.	115,267	Gross value	$758,153
Less	50,169	Less	430,911
Net	65,098		$327,242

Indian Terry. (Okla) 2,936 Tons Value $27,790

California refineries have begun manufacture on a large scale of a liquid asphaltum from certain oils of asphaltum base. See "L" grade oil or "road oil"

1906. J.A. Taff, P. 1131. Oil asphalt refined from crude on the Pacific and Gulf coasts. Describes occurrences in Texas and Indian Territory (Okla) and mentions the grahamite near Loco, and in the Choctaw, also near Page. He compares the last with the grahamite of Ritchie Co. W.Va. He includes "road oil", or refined product of crude, among the used products. The productive States are: Cal.,Ky., I.T., Utah, Ark., Tex. Ga.

Prod.Gross	138,059	Gross Value	$1,289,340
Less	62,454	Less	591,248
Net	75,605		690,092
Ind. Terr (Okla)	2,690		$ 18,461

1907. J.A. Taff. In describing occurrences says extensive deposits in Oklahoma. (This was Statehood year in November) Author notes Stephens, Carter and Jefferson counties in the Permian. Mentions near Loco and Asphaltum. Asphaltic sands near Woodford and Ardmore, Buckhorn, Fitzhugh. Ordovician bituminous SS and Ls. of Murray Co.

He describes

"Asphaltic sands of Cretaceous age occur near (Cal. Tex., Wyo.)

Wolf Creek, Pike Co., Ark. Bituminous S.S. Carboniferous Higginsville, Lafayetta Co., Oil asphalt in crudes of Cal. Tex. Kan. and Okla. certain crudes, sometimes as much as 35% of oil asphalt. Grahamite is mentioned in W. Pushmataha and E. Atoka, in vertical veins in the carboniferous. Refers to near Loco and in Page, LeFlore Co. "It is reported that these are too highly metamorphosed to be of commercial use. Productive States are: Cal., Utah, Okla. Ky., Tex.
Table, P. 728.

Prod	Gross	223,861 Tons	Gross Value	$2,826,489
	Less	136, 204	Less	1,881,540
	Net	87,657		944,949

Oklahoma (Ind. Terr) 5,038 Tons Value 20,770

1908. J.A. Taff. Natural bitumen not of sufficient quantity at present for exploitation in Sta. Barbara, Cal. or in Oklahoma, but author describes varieties grahamite, albertite and the refining of oil asphalt. Productive States are Cal., Utah, Okla., Tex., Ky.

Gross Prod.	198,382 Tons	Gross Value	$2,057,881
Less	115,281		1,491,616
Net	83,101		566,265
Oklahoma	2,402		$ 23,820

1909. D.T. Day. Oil asphalt is increasing and more than a half of the 1908 and 1909 production consists of oil asphalt due to increased oil production of the asphaltic oils of Texas and California. Productive States: Cal. Utah. Okla, Ky., Tex.

Prod. 99,794 Tons Value $579,810 U.S.
Oklahoma Prod. 10,419 Value $48,130.
This includes W. Va.

1910. D.T. Day. Remarkable demand for road building and therefore for residue asphalt. See "Bitumens and their essential constituents for road construction and Maintenance", No. 93, U.S.Dep't Arg. Apr. 1911

Prod Gross	260,080	Value	$3,080,067
Less Oil	159, 424	Less	2,207,937
Net	100,656		872,130
Oklahoma	11,959		65,244

Prod. States: Cal,Utah, Okla,Ky,Tex.

1911. D.T.Day. Better roads movement caused increased production of total, but there was a decrease in Rock Asphalt production.

Gross Prod	360,004 tons	Value	3,825,751
Less Oil Asphalt	234,951		2,684,230
Net	125,053		1,144,521

Oklahoma, including Ill. & Ky.

Gross Prod	82,387	Value	420,931
Less refined oil	52,650		215,900
Net	29,737		105,031

Producing States: Cal., Utah, Okla (incl. Ill & Ky) Tex.

Apparently for the first time credit asphalt refined residue from crude petroleum. as and asphalt.

1912. D.T. Day referred to meeting of the Am. Soc. for T Testing material, which defined bitumens and asphalts.

Bitumens are mixture of native and pyrogenous hydrocarbons and their non-metallic derivatives, which may be gases, liquids, viscous liquids, or solids, and which are soluble in carbon disulphide.

Asphalts are solid or semisolid native bitumens, solid or semisolid native bitumens; solid or semi solid bitumens obtained by refining petroleums; or solid or semi solid compounds which are combinatio of the bitumens mentioned with petroleums or the derivatives thereof. These melt on the application of heat and consist of a mixture of hydrocarbons and their derivatives, of complex structure largely cyclic."

In 1912 61% of the asphalt used in paving is derived from petroleum.

Gross Prod.	449,510	Value	$4,620,731
Oil asphalt	333,213		3,534,077
Net	116,297		1,086,654
Oklahoma	65,717		341,373
Less	53,545		283,824
Net	12,172		57,549

Producing States: Cal., Utah, Okla (Incl. Ill & Ky) Texas.

1913. D.T.Day. Oil asphalt residuum is becoming more important and less interest in natural asphalt. Producing States: Cal.Ky., Okla, Tex. Utah, W.Va.

1914 History of Asphalt in America beginning in 1868.

1915. J.D. Northrop. Importance of asphalt steadily increasing, but the tendency is toward utilization of the product as refined from crude oil, except in regions remote from refineries in which the native rock supply holds its own.

1916. J. D. Northrop. In natural asphalt 15 companies are engaged in quarrying as against 14 in 1915. General business prosperity. Producing States: Cal., Ky., Utah, Okla., Tex. The Okla Production consisted of 2 properties in Pushmataha; 1 in Atoka; a and 2 in Pontotoc counties, of grahamite, See Jumbo discovery by Townsend in 1916, July.

1917. Asphalt production stimulated by War demands, but later retrenchment. Producing States: Cal. Ky., Okla. Tex. Utah. See Missouri.

1918. C.C. Osbon. Pub. in 1921. Municipal economy in ~~1918~~ 1918 but asphalt prospered. In Cal a decrease account of high price of oil from which refined.

1931. A. H. Redfield.

1932-1933 A. H. Redfield. U.S.Bur. Mines Minerals Yearbook.

1932. A. H. Redfield. Yearbook.
U.S.Production 340,019 Value $1,942,943.
Productive States Ala. Kan, Cal. N.M. Utah. No. figures are shown for Oklahoma separate production

1933. U.S. Production 313, 135 Value 1,705,310
Productive States as above and no separate figures for Oklahoma.

1934. A. H. Redfield. Oklahoma increase over 1933 in sales of rock asphalt.
U.S.Prod. 440,852 Value $2,365,750.
Grouped together Okla. Tex. and N.M.
Prod. 290,940 Tons Value $1,152,331

content is 6-10%. Productive States: Ala, Tex. Cal. Ky. Mo. Okla.

1927. G.R. Hopkins & A. B. Coons. Productive States: Ala, Okla. Cal. Ky, Tex. To the list of producers of native asphalt add: Western Paving Co., Petroleum Bldg. Oklahoma City.

1928. A. H. Redfield. Productive States: Ala. Okla., Cal. Ky, Mo. Tex. Utah.

1929. A. H. Redfield. Decreased production.

1930. A. H. Redfield. Gives the following addresses:
Asphalt Ass'n. 441 Lexington Av. N.Y.
Am, Ass'n Asph. Techn. N.Y.C.
Asphalt Paving Ass'n Engr. Bldg. Chicago.
Western Asphalt Ass'n.

1923. Productive States: Ky., Tex., Okla., Cal., Ala, Asphalt mainly used in paving, and author refers to establishment in 1919 of, The Asphalt Ass'n, 25 W. 43d St. N.Y. and 314 Wright Building, K.C., Mo.

1924. W. K. Cottrell. Ky, Tex. Utah, Okla., retained rank as producers. Ala. went ahead of Cal., and Mo. entered the list with small production. Okla. decreased in tonnage and value.

1925. G.R. Hopkins & A.B. Coons, Small increase in quantity and value. Productive States: Ala, Cal, Ky, Okla, Tex. Mo. Utah.

1926. G.R. Hopkins. An increase of 23% in volume and 7% in value. As used in paving there is no general rule as to uniform bitumen, but the average bitumer

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Productive States: Cal. Okla. Utah, Ky., Tex.
See Oklahoma card.

1919. K.W. Cottrell. An excess of 47% over 1918, but a decrease of value of native rock asphalt, 13% Productive States: Cal., Okla., Utah, Tex., Ill. Ky., Colo.

1920. W.K. Cottrell. An increase in national sales of 14%. Six operators report of biuminous rock more than double the amount of 1919.

1922. W.K. Cottrell. General increased production all over the U.S. Productive States: Cal, Okla., Utah, Colo, Tex., Ill, Ky.

1921. W.K. Cottrell. Increased production. See Okla. cards for named producers.

Grahamite Mine -2- (con't)

"The formations associated with asphaltic coal of this locality are SS. shales and clays which beds have been cut by a series of parallel fissures ranging from a few inches to several hundred feet apart -- Three well defined veins have been discovered and opened on this property, known as the Sanner claim, which is 90 acres in extent. The main vein has been traced for fully half a mile by shafts and test pits, and has a strike of 47 deg. E. of N. and a pitch of 80 to nearly 90 Deg. to the NW running parallel with it, at a distance of about 300' to the S., is a second vein, which has been traced for about ¼ mile, beginning with the extreme W. extension of the former vein. These two parallel veins are cut by another which has a strike of 45 deg. W. of N. The pitch of this vein is also 80-90 Deg. butiin this case to the W. It has been traced for a distance not to exceed 350' the contents pinching out to the N. and the S., although the fissure continues further. Development work on the cross vein showed the existence of still another vein running parallel with the first two and at a distance of 250' N. of the middle vein-------(The pitch of veins average 85 deg., but enlargements may range from vertical to 45 deg.)

The greater portion of the longest vein, designated as the main vein, is barren, or has only a few inches of asphaltic coal. The extreme E. portion of this vein has proven to be the most productive, and the vein as a whole is more productive than any other.

Four shafts have been sunk at $\frac{1}{2}$ mi. from the cross vein, at which point the vein has pinched out quite

abruptly -- its continuation is then uncertain from this point in E. Just W. of this squeeze or pinch-out occurs the most extensive part of the deposit, which extends for a distance of 800 to 1000' along the vein, and it is in this portion of the vein that the shafts are located. The first shaft is sunk at a point 85 feet from the termination of the vein, while the others are located at intervals of 150' to 300' apart. The shafts vary from 60' to 100' deep, some of which still continue in the deposit, while others have passed below what appears to be the workable limit. -- A careful examination of the vertical sections of the deposit, rendered possible by open stopes, shows a peculiar arrangement of the parts of the vein, and gives a decided impression of vertical folding along the line of the vein.

So pronounced is this effect that in several cases observed the enlargement of pockets, in the deposit, were connected only by a few inches of vein filling or necks, the adjacent ends of the pockets slightly overlapping as though having been acted upon by vertical compression. The condition of associated formations on both hanging and foot walls does not, however, bear out the idea of folding, but rather seems to point to the squeezing effect of lateral compression, as the agency which acting upon a viscous non-compressible material has produced the marked irregularities of vein content noted. The softness and weakness of the country material have rendered the irregularities more striking. The brooming of the shales and the broken condition of the harder Ls. and SS portions of the walls also corroborate the lateral compression theory---- Fissuring rather than faulting seems to be the condition

1938. A. H. Redfield.
U.S.Prod. 477,741 Tons Value $2,874,803
Tex. Okla. N.M. 206,443 " " 727,032

1939. A. H. Redfield.
U.S. Prod. 449,848 Tons Value $3,066,844
Tex. Okla. N.M.321,497 " " 684,808

1940. A. H. Redfield
U.S. Prod. 490,665 Tons Value $2,725,337
Tex. and Okla.282,250 " " 833,248

1935. A. H. Redfield. Asphalt used in road construction mainly. Lower prices in 1935.
U.S.Prod. 347, 392 Tons, Value $2,148,761
Okla. Tex. and N.M. grouped together:
Prod. 185,013 tons Value $726,801

1936. A. H. Redfield. U.S.Production 581,064 Tons
Value $3,260,895
Tex. Okla, N.M. Production 333,243
Value $1,245,442
The recovery in the asphalt industry exceeds the peaks of 1927 and 1929.

1937. A. H. Redfield. U.S. Prod. 485,384 Tons
Value $3,019,038
Tex. Okla. N.M. Prod. 265,895
Value $1,075,832

ASPHALT GENERAL

U.S. Bur. Min. Yearbook 1941. Only "confidential" copy issued P. 1183 Asphalt. Anaugmented demand for refining asphalt. The tonnage of bituminous rock sold had a greater proportional increase of 43%

Rock asphalt U.S.	1940 Sold	458,465	Tons	Val.	$1949166
	1941 "	654,692	"	"	2312227
Texas & Okla. Comb					
1940		282,250			$ 833248
1941		446,432			1197319

U.S. Prod. 1942 935,295 $3,367,279
Increase in value $3.53 to $3.60 ton native asphalt
Texas & Oklahoma combined.
1942 699,572 $2,018,822

Commercial Development. Large quarry pit 100' deep in ve vein 45-75' wide. Water-extraction plant erected but abandoned. Contains 12½% asphalt.

Miscellaneous. Above solely derived from Abraham, Table XVI, p. 160, without definite quarry locations. Some confusion between this and Item of Location No. 8 of Hutchison. All of these must later be verified. Further Abraham, p. 165 the following:

"Tests made with sand asphalt taken from the quarry in Carter County, Sec. 12 and N.½ Sec. 13, T3S, R1W, 18 Mi. NW of Ardmore indicated the following. The dry sand contained 12½% pure asphalt (fusing point R&S 65 and 69F By water extraction the following:

Sec. ~~13~~ 12, T3S, R1W.

(17)

Name of Property.
M. & A. Schneider Lease.
960 acres shown.

Location. Sec. 12 and N½ Sec. 13, T. 3S, R1W. NW. of Ardmore. In Carter County.

Material Described. Sand Asphalt.

Information Source. 12, p. 160. Also A, 3, p. 13.

General Geology. Vertical Fault between shale. The line shows outcrop traced by Tomlinson (See Map 1931) of asphaltic sand of Deese Fm.

	Bit. sol. in 62 Naphtha	0.7	3.4
	This is % of Tot. Bit.	0.7%	3.47
Carbenes	Bit. insol. in carbon tetracholride air temp.	68.7	55.0
	Bit. insol. in hot carbon tetracholride	48.6	1.3
	Bit. yields on ignition, Fixed carbon	~~35.3~~ 53.3	41.0

Ultimate composition.	Oklahoma	West Va.
Carbon	-----	86.56%
Hydrogen	----	8.68
Sulphur	-----	1.79
Diff.	----	2.97
		100.00

Added to the above:

Physical properties.

Hardness	Brittle	2
Odor	None	None
Softens	Intumesces	Intumesces
Penetration at 78	0	0

Chemical properties.

Loss at 325F,7Hrs.	+0.1%	----
Loss at 400F,7Hrs	+0.5	
Bit. So. in Cs2	94.1	97.8
Differance	0.2	0.1
Inorganic or Min.	5.1	2.1

Other analyses are given from various countries.

Glance Pitch. This was first reported in Barbados in 1750. The name Manjak was used to designate the grahamite of Trinidad. Following anlysis.

Glance Pitch (Manjak) from Barbados.

Physical properties.	Sp/ Grav. 78 F/78F. Original	1.0844
	Streak	Dk. brown
	Luster	Lustrous
	Stucrture	Uniform
	Fracture	Conchoidal
	Hardness	1.
	Softens	230 F.
	Flows	250 F.
	Penetration at 78 F.	0.
Chemical properties.	Bit. sol. in Cs2 air temp	99.22
	Difference	0.5
	Inorganic or mineral mat.	0.3
		100.0
Malthenes	Bit. sol. in 38 naphtha	26.9
	This is % of So. Bit.	27.0

	% sol. Bit. rem. by H2SO4	75.0
	Bit. So.. in 62 Naphtha	40.4
	This is % of Tot. Bit.	40.7
Carbenes.	Bitumen insol. in CsO4	1.2
	Bitumen yeilds on ignition	
	Fixed carbon	25.0

Glance Pitch is intermediate between Gilsonite and grahamite.

Asphalt General.

Professor W. Nash, "The nomenclature of Petroleum Products
The Science of Petroleum (1938) p. 7.

"Bitumens. Mixtures of hydrocarbons of natural or pyrogenous origin, or combinations of both, frequently accompanied by their non-metallic derivaties, which are completely soluble in carbon disulphide (A.S.T.H. Designation D 8-33)

Bituminous emulsion. A liquid product for application to road surface, in which a substantial amount of asphaltic bitumen, or other bituminous road-binder is suspended in finely divided condition in an aqueous medium by one or more suitable emulsifying agents.

Black oil. Oil with high asphaltic content.

Blown asphalt. Asphalt or asphaltic bitumen obtained by blowing air through petroleum residue or natural bituminous substances heated during the blowing process.

GENERAL.

S.J. Pirson, Measurement of Gas Leakage Applied to Oil Search, Oil & Gas Journal. Feb. 20, 1941, p. 21-32

This paper originally presented to the Petroleum Division A.I.M.M.E.

Geochemical prospecting is one of the oldest lines in the discovery of oil. Oil springs were followed up but a German patent was taken Dec. 28, 1921, for the first time to follow up the microscopic phase of surface showings. Soil analysis is quite recent.

To obviate the difficulties of measuring the rate of leakage the writer was forced to a new procedure- the geodynamic process introducing the time factor, to measure the escape of gases. Rate of pressure build up in a shallow bore hole is measured selectively for each of the gases leaking from an oil and gas accumulation. Knowing thepressure rise for a given time for each gas of a known volume, then the expression:

1- By volume of a given gas which diffuses at a given length of time.

2- By volume of a given gas at standard condition which diffuses per unit area in a given time.

3-By the number of molecules of a given gas which diffuses in a given time in the vessel or unit area.

Observations show these.

1- The maximum rate of leakage is directly above the axis of the source.

2- The depth of the source does not materially affect the value of the maximum.

3- The rate of leakage is symmetrical about the

vertical to the source and the slope of the curve representing the rate of leakage decreases directly with the depth of the source. The depth may be calculated by finding the distance from the peak at which the leakage is 0.4 of the observed maximum value.

4- Over a shallow sheet source, a flat top leakage curve, the width of that flat top being about equal to the width of the sheet.

5- As the depth of the sheet increases the flat top of the curve becomes less distinct.

Quantitative Interpretation.

Geodynamic survey results. A piezometric method was adopted after experimentation and this was applied successfully in 1942, just S. of the Bradford field.

The maximum rate of ethane leakage was 23 cu. mm. per 24 hours, per sq. ft. which equals roughly 8000 cu. ft. of ethane per sq. mile right above the field which is 8000 times the sensitivity of the instrument.

Conclusion. 1- The geodynamic observes directly the dynamic phenomenon of hydrocarbon gas leakage from a reservoir.

2- This method does not require the analysis of either soil, gas or samples. The measurements are purely physical.

3- This method should give no indication of leakage above granite rocks where oil or gas are not found.

4- Patterns of gas leakage observed above oil or gas accumulations should not remain permanently nor constant in intensity when they exist. Patterns should disappear if reservoir pressure diminished.

5- No correction necessary for the type of soil.

6- Gas leakage follows the mathematical theory of potantial which has been applied in other geophysical methods such as the electrical etc.,

7- The halo theory of leakage is not verified by this process since the maximum leakage is in the center of any structure. However, this may occur in Salt Dome structure.

8- Distinction ofgas, oil or condensate becomes possible before drilling.

9- Results of this process should show no randomness as they do not depend on soil characteristics.

10- Interpretation follows the application of well known mathematical principles and is straightforward without trial and error procedure.

11- The presence of a water horizon should not affect the leakage of gas.

12- The measurements are independent of organic matter in the soil.

GENERAL ASPHALT

H. B. Pullar Blown Asphalt, Science of Petroleum Vo. IV, (1938) P. 2700

F. X. Byerley, Pat applied for April 28, 1893 was essentially a distillation process. Treated residuum oil by heating to about 600 F. and sucking air through it by suction pump.

Feb. 21, 1898 C. K. Culmer's Pat. by which a residuum oil was charged chemically by forcing much air through the heated mass at comparatively low temperature, and below those of the Byerley method. This was the forerunner of the present methods. Both of these are unsatisfactory in making asphalt for paving, but are good in making paints etc.

It was not until 1908 after discovery of heavier crudes of asphalt base in Illinois and Kansas that the industry of air blown asphalt became important. These semi-asphaltic oils had better results. Then came better production from Texas and California crudes.

ASPHALT GENERAL.

Redfield, Asphalt, U.S.G.S. Min Res. (Yearbook) 1934. P. 217-218.

The following definitions.

Paving Asphalt. This asphalt or asphaltic cement, fluxed or unfluxed, reproduced for direct use in construction sheet asphalt, asphaltic concrete, asphalt macadam, and asphalt block pavement. Also for use as joint filler, in brick, block and monolithic pavement.

Roofing asphalt. Asphalt and asphaltic cement use in saturating coating and cementing felt or other fabric and in the manufacture of asphalt shingles.

Water proofing asphalt. Asphalt and asphalt cement used to waterproof and dampproof tunnels, foundations of buidlings, retaining walls, bridges, culverts, etc, and

for reconstructing built up roofs.

Briquetting asphalt. Asphalt and asphalt cement used to bind coal dust or make into briquets.

Mastic and mastic cake. Asphalt and asphalt cement for laying foot pavements and floors, waterproofing rail road bridges, Lining reservoirs, and tanks, capable of being poured and smoothed by hand trowelling.

Pipe coating. Asphalt and asphalt cements used to protect metal pipes from corrosion.

Molding Compounds. Asphalt used in the preparation of molding compositions such as ---boxes, chemical fittings, push buttons, knobs, handles, etc.

Miscellaneous Uses. Asphalt and asphalt cements used as dips, and in acid-resisting compounds, putty, saturated building paper, fiber bound and floor coverings and not included previously.

Flux. Liquid asphaltic material used in softening native asphalt or solid petroleum asphalt for paving, roofing, waterproofing, etc.

Cut back asphalts. Asphalts softened or liquefied by mixing them with petroleum distilate.

Emulsified asphalts and fluxes. Asphalt and flux is emulsified with water.

ASPHALT GENERAL.

A. H. Redfield, "Native Bitumens", Industrial Mineral and Rocks, A.I.M.E. (1937) PP. 527-531.

"Abraham defines bitumens as substances of variable color, hardness, and volatility; composed principally of saturated hyrocarbons substantially free from oxygenated bodies; sometimes associated with mineral matte: the non-mineral constituents being fusible and largely soluble in CS_2.

Gilsonite Since 1925 the value f.o.b. shipping point has been from $19.43 to $22.90 [illegible].

Wurtzilite "Kapak" is refined wurtzeilite asphalt. Value in 1935- $79.00

Grahamite, Glance Pitch. Sp. Gr. 1.15-1.20. Was mined in Pushmataha Co., Oklahoma, until 1924.

Ozokerite, Produced in Polish Galixia. It is a polymerization of a paraffine base petroleum.

Lake Asphalt of Trinidad described.

Bituminous rock One example is the Uvalde deposit, value $3.24 ton in 1935. The author quotes the Southern Rock Asphalt Co. as a main producer in Oklahoma.

Competition with petroleum asphalt. Native asphaltites have physical characteristics for special uses. Bituminous rock has the advantage of being available for immediate laying of material.

See bibliography of the trade with 24 items.

Grahamite.

Clifford Richardson. (Ref. No. 19) "Grahamite a Solid Native Bitumen", Jour. Am. Chem. Soc., 32, 1032, (1910). This refers to Fayette and Webb Counties, Texas, but also see pp 1032-1040, Tests and Tables.

History of Grahamite. First found in the early 1860's in Ritchie County, W. Va. it was named for Messrs Graham, by Henry Wurtz, because they were commercially interested. Early writings concerned themselves with the origin. and the relations of coal, asphalt, and albertite. In 1890 Wm. Blake found in Utah. He said Grahamite, albertit and asphaltum distinguished from each other. In 1899 Taff in error in stating that albertite is soluble in carbon disulphide which it is not. In 1901 Eldridge failed to recognize the characteristics of grahamite and gave the

name Impsonite, although later he recoggized Grahamite. in 1909 Taff and grahamites of S.E. Okla. Anderson is quoted thus. "The asphalt found here (in S.E. Nevada) would be commercially known as grahamite, but its characteristics show it to differ from the variety so known scientifically. A few tests show d a close relationship to the variety from Indian Territory which Eldridge describes as impsonite. But Anderson showed that he did not know that impsonite was grahamite . Taff and Redwood agree that all solid bitumens of Oklahoma are grahamites, per the W.Va. model type. Richardson gives as type example from Ritchie County, 25 miles a little N. of E. of Parkersburg, on McFarlan's Run near the S. Fork of Hughes River. The sample was taken from the vein at a time when the mine was originally worked, between 1865 and 1875.

Richardson (1910) p. 1037.

"The grahamite of Oklahoma was derived from oil of the type of the Mid-Continent Fields which contains large amount of paraffine hydrocarbons, although it is also asphaltic."

From non-paraffin oils are formed the asphalts gilsonite, glance pitch etc which differ among themselves and from grahamite, Native bitumens are soluble in carbon disulphide. If a substance is not thus soluble then it is a pyrobitumen, such as albertite- a long distance in metamorphism.

P. 1048. Richardson's definition of grahamite: a brittle, solid bitumen the result of metamorphism of petroleum; generally pure but at times associated with adventitious mineral matter. Because of fracturing subsequent to the entering of the fluid into opening, it is characterized by a schistose fracture. It does not melt but intumesces; is soluble in carbon disulphide and only to a small extent in light naphtha and yields a high percentage of residual coke on ignition out of contact with air.

See the LeGrand deposit of Stephens County Oklahoma: the pyrite crystals visible to the naked eye. See also minute fracture of the material already referred to.

Richardson defines: asphaltene is that portion of a bitumen soluble in carbon disulphide; but not in light naphtha. This he distinguishes from malthene which resembles natural maltha.

See previous card. Sampel 19, 399, of W. Va. grahamite taken in 1870. The test:

Fracture	Schistose.
Luster	Dull
Sp. Grav.	1.130
Loss at 100 Deg	0.4%
Bitumen	97.7
Inorganic matter	2.0
Sol. in 88 Deg. Naphtha	9.4
Sol. in 62 " "	10.7
Residual Coke	36.8
C	86.56
H	8.68
S	1.79 Diff 2.97

ASPHALT GENERAL.

Clifford Richardson. Nature and Origin of Asphalt, Barbe Asphalt Co. Oct. 1898.

This is quoted by Eldridge (1902) p. 297:

A definition. "The natural bitumen which is known as asphalt, is composed of saturated and unsaturated dicyclic or polycyvlic, alicyclic hydrocarbons, and their sulphur derivatives with a small amount of nitrogenous constituents. Asphalt may, therefore be defined as any hard bitumen, composed of such hydrocarbons and their derivatives which melts upon the application of heat to a viscous liquid; while a maltha or soft asphalt may be defined as a soft bitumen, consisting of alicyclic hydrocarbons, which on heating, or by other natural causes becomes converted into asphalt. The line between the two cannot be sharply drawn."

Further on Eldridge, P. 299 Richardson is quoted: "Asphalts are distinguished by the large amount of sulphur they contain, and it is to its presence that many of the important characterist~~i~~ics, and perhaps in part, th origin of this form of bitumen is due. The soft asphalts or malthas contain much less sulphur than the harder ones, or if the former are rich in sulphur, they are then in a transition stage and will eventually become hard. But a small portion of the constituents of a hard asphalt are volatile even in vacuo, but they can be separated by solvents into an oily portion, which is soft, or softens readily when heated, and a ahrder protion which does not melt by itself without decomposition, and is a brittle solid, but soluble in the oily or softer portion. The

harder and less soluble portion always con'ains the larger portion of the sulphur. It seems therefore that sulphur is the effectural hardening agent of many natural asphalts, in the same way that it is of artificial asphalts which are produced by heating a soft natural bitumen with sulphur."

ASPHALT GENERAL.

P. E. Spielmann, "Nomenclature of the Bitumens", Science of Petroleum, (1938)

Definitions:

<u>Bitumen</u>. Mixture of hydrocarbons of natural or pyrogenous origin or both, which can be gaseous, solid, liquid, semi-solid, and which are completely soluble in carbon disulphide.

<u>Asphaltic bitumen</u>. Naturally occurring bitumen or bitumen prepared from natural hydrocarbons, solid or viscoud, with low % of volatile properties, possessing characteristics, agglomerating properties, and substantially soluble in carbon disulphide. This is a foreign definition

The American is:

Asphalt. Black to dark brown solid, semi-solid, materials which liquify when heated, in which predominatin are bitumens all of which occur in solid or semi-solid for in nature or are obtained by refining petroleum, or which are combinations of the bitumens mentioned with each other or with petroleum or its derivatives. Tar bituminous product viscous resulting from destructive distillation of organic materials such as coal, oil, lignite, peat, or wood.

Pitch. A dark brown solid or semi-soldid, fusible and agglomerative residue after partial evaporation or fractional distillation of tar.

Asphaltite. A naturally occurring substance allied to asphaltic bitumen, soluble in carbon disulphide 40 to 100%, haveing a softening point (ring and ball) above 250 Deg. F.

Examples Oxy-asphaltite Grahamite
Thio-asphaltite Gilsonite Manjak

Albertite. A mixture of asphaltic bitumen with finely divided organic matter that is insoluble in carbon disulphide.

Petrolenes. Obeolescent, See Malthenes.

Malthenes. Soluble in carbon disulphide, carbon tetrachloride, and standard petroleum naphtha.

Asphaltenes. (hard asphalt) Soluble in carbon disulphide and carbon tetrachloride, but insoluble in standard petroleum naphtha.

Carbenes. Soluble in carbon disulphide, but insoluble in carbon tetrachloride.

****

Kerol. The component in kerotene that is soluble in pyridine, but insoluble in chloroform.

Asphaltum. (soft asphalt) Soluble in carbon disulphide, insoluble in a mixture of equal parts by volume of ethyl ether (Sp. Gr. 0.72) and ethyl alcohol. (96%)

In addition to the above J. E. Hackford (Minl & Met. 163, 1930) introduced the following:

Kerite. A natural bitumen composed appreciably or wholly of kerotene.

Examples	Oxy-kerite	Albertite	Elaterite
	Thio-kerite	Wurzilite	Impsonite

Kerotene. The component in kerite that is insoluble in carbon disulphide,

Kerole. The component in kerotene that is soluble in pyridine, but insoluble in chloroform.

Some of these terms are now understood internationally, but others are not yet fully accepted.

ASPHALT GENERAL

W.T. Thom, Jr. "Present Status of the Carbon Ratio Theory." "Problems Pet. Geol. A.A.P.G. (1934) P. 78.

"In 1928 C. L. Baker cited oil seepages which he considered threw doubt on the carbon ratio theory. Active seepages known both in highly deformed rocks and those subjected to considerable contact metamorphism, in Mexico, which have suffered dynamic and contact metamorphism. These throw doubt on th validity of the theory. Metamorphism and igneous intrusion may, under some circumstances change the original nature of the oil in a manner somewhat analogous to the change from lignite or bituminous coal to anthracite or graphite under similar conditions, but unless sufficient oxygen is present to bring about actual combustion of the oil or there is a free outlet

for its escape, it will not be destroyed."

ASPHALT GENERAL.

Parker D. Trask "Limestone as a Source of Oil.", A.A.P.G. Bull. Vol 12 (1928) P. 556:

A.P.I. Project 4 studied the limestone forming deposits of Florida Keys and the Gulf of Butabano in Cuba. T. W. Vaughan had suggested a large organic content for the Florida calcareous deposits. Samples taken were distilled as in the same manner as oil shales. The maximum yield from marine deposits were found to be 2.5 ga per ton. This from four different regions. The fact that 1% of the total weight of these sediments can become volatile and condense to a liquid oil is significant and such beds are potential future source beds.

The limy oozes in Florida Bay and Butabano Gulf, gave the above yield. Limestone may be source beds of oil. Limy oozes from Key West, far frmm Florida Bay, gave only a faint oil trace and cannot be regarded as potential future source beds.

P. D. Trask, Time vs. Temperature in petroleum generation. A.A.P.G. Bull. vol. 15 (1931) P. 83.

Discusses David White on time and temperature in generation of bitumen. Maier and Zimmerly had shown that conversion of organic matter to bitumen (soluble in carbon tetrachloride) was not solely dependent upon temeperature, but the lower the temperature the longer the time. They stated that no organic matter was converted by treating a sample 90 days at 100 C. but at that temperature it would take 8.4 X 10 to the 5th power (Trask corrects that to 10 to the 4th power) therefore 84,000 years. As the temperature falls the time factor lengthens. At 80 C. or 176 F., the time would be 2 million years, and

at 60 C. (or 140 F) it would be 67 million years. An example from Lake Maracaibo: sediment with about 5% organic matter had about 3% of that content converted to bitumen in 12 hours at 280 C.; about 9% in 12 hours at 309 C.; and about 13% in 2 hours at 339 C. Impossible to calculate the rate of conversion at depths to which the sediments would probably be interred during generation of petroleum.

By the author's studies it is shown that the bitumen or the part soluble in carbon tetrachloride or ether, is several times greater than in recent sediments of comparable organic content. This indicates that in the past deposits some of the organic matter has been converted to bitumen. "In fact it suggests that the formation of bitumen perhaps is an intermediate step in petroleum generation."

P.D. Trask "Proportion of Organic Matter converted into oil in Santa Fe Springs, Cal." A.A.P.G. Bull. Vo. 20. Nov. 3 (1936) p. 245.

All the oil in the Santa Fe field at time of discovery is equivalent to 0.053% of the weight of the prism of sediments from which the oil seems to have been derived. As the organic contents of these sediments at time of deposition is 3.0% of the weight of the sediment the yield would be 0.053/3.0 or 1.8% of the organic content of the sediments. This is the minimum production of oil by the organic matter. The actual quantity that was generated by the source beds presumably was large as some oil that was formed may have failed to reach the reservoir. When the possible sources of loss of oil such as retention by source beds or escape to the surface destruction by bacteria, trapping and absorption while migrating, are consiedred, the most probably yield of oil or organic constituents is of the order of magnitude of 4% although the yield may have been as high as 15%.

P. D. Trask, A.A.P.G. Bull. vol. 20 (1936) p. 1246. refers to Potonie who in 1932 investigated bituminous limestone microscopically and concluded the organic matter more likely primary than secondary. The authors regard bituminous limestone more closely allied to petroleum than the bitumen in shales. Therefore in some cases limestone may be good sources of petroleum.

(See Arbuckel limestone and seepages in Carter county, H.B.G.)

ASPHALT GENERAL.

Statistics of Native rock asphalt production, taken from U.S.G. and U.S. Bur. Mines, Mineral Resources and Mineral Year Books.

Year	Production Short tons	Value
1882	3,000	$ 10,500
1883	3,000	10,500
1884	3,000	10,500
1885	3,000	10,500
1886	3,500	14,000
1887	4,000	16,000
1888	50,451	187,500
1889	51,735	171,537
1890	40,841	190,416
1891	46,054	242,264
1892	87,680	445,375
1893	47,779	372,232
1894	60,570	353,400
1895	68,163	348,281
1896	80,503	577,563
1897	75,945	664,632
1898	76,337	675,649
1899	75,085	553,904
1900	54,389	415,958
1901	63,134	555,335
1902	84,632	461,799
1903	55,068	483,282
1904	64,167	420,701
1905	62,898	305,242
1906	73,062	674,934
1907	85,913	928,381

Year	Production	Value
1908	78,565	517,485
1909	79,061	572,846
1910	98,893	854,234
1911	87,074	817,250
1912	95,166	865,225
1913	92,604	750,713
1914	79,888	642,123
1915	75,751	526,490
1916	98,477	923,281
1917	81,604	773,424
1918	60,034	780,808
1919	88,281	682,989
1920	198,497	1,213,908
1921	296,412	1,985,583
1922	327,792	2,253,180
1923	400,235	2,385,631
1924	562,367	3,958,339
1925	584,850	4,148,400
1926	715,180	4,484,960
1927	839,040	5,605,850
1928	807,860	5,175,055
1929	804,027	5,470,493
1930	702,777	4,463,092
1931	503,383	2,930,451
1932	340,019	1,942,943
1933	313,135	1,705,310
1934	440,852	2,365,750

Year	Production	Value
1935	347,392	2,148,761
1936	581,064	3,260,895
1937	485,384	3,019,038
1938	477,741	2,874,802
1939	459,848	3,066,844
1940	490,665	2,725,337

(This should be checked vs. the Statictis of Sells in Science of Petroleum)

demand rapid or intermittent sedimentation. The study of the organic material in Tertiary or Recent deposits may fill in some of the gaps in the chemical history of petroleum."

Further in the Summary, P. 298, "8. Asphalt is a primary product, not a derivative or oxidation of petroleum,"

B. T. Brooks, "The chemical evidence for low temperature history of petroleum", Jour. Inst. Pet. Tech. vol. 20 (1934) pp. 177-205.

Digested by P. D. Trask, A.A.P.G. vol. 20 (1936):

Distillation theories of the origin of oil are inadequate because distillates of organic matter are rich in unsaturated compounds and gases, are free of hydrogen and carbon monoxide. Crude oils contain heat unstable nitrogen and sulphur compounds which are destroyed at temperatures needed to produce oil by destructive distillation. Fuller's earth assists polymerization.

Pressure is of little importance.

B. T. Brooks, "Origin of Petroleum", A.A.P.G. Bull. vol. 15, No. 6, Summary P. 625: (1931)

All chemical and geological evidence indicate low temperature history of petroleum.

Composition of oil and gas precludes action of alpha radiation from radioactive minerals as agent in petroleum formation.

High pressure precluded by absence of hydrogen in natural gas.

Presence of benzene hydrocarbons accounted for by disproportionation reactions at low temperatures.

Property of (causing) polymerication possessed by different sedimentary rocks believed to account for gas oil and lubricant fractions of petroleum.

In discussion of this, P. 627, P. D. Trask:

"If petroleum is generated by polymerization of hydrocarbons it must occur after sediments consolidated,

because large quantities of several recent sediments having a large organic content indicate that they contain no measurable amount of liquid hydrocarbons.

-----some of the work done by A.P.I. Project 4 indicates that conversion of the organic matter to a form soluble in ether takes place at much lower temperatures than those required to generate oil by destructive distillation; it is not impossible that transformations of the organic matter, akin to distillation, may take place slowly at temperatures prevailing in the zone of petroleum formation."

Jefferson County.
(Geological)

John R. Bunn. Jefferson County, Oklahoma Geological Survey, Bull. 40-PP, 1930, p. 246: Under heading, Asphaltum Sandstone:

"The most important sand horizon from the standpoint of areal mapping is the Asphaltum sand. This sand is exposed in the vicinity of the town of Asphaltum and occurs thru parts of Twnps. 3 & 4 S, R's 4 & 5W. It marks the Healdton uplift showing up as a series of inliers along this major structural feature, with the overlying Claypool and Addinton formations occurring progressively on either side. In every instance an exposure of this sand zone of any extent along this structural trend is indicative of anticlinal structure. This sand zone is exposed over or around the Loco pool, the Hewitt pool and other undeveloped anticlinal features along the Healdton uplift.

The Asphaltum consists of a series of gray to buff, yellow, calcareous sandstones, generally massive, friable, and medium grained, but locally laminated, and thin bedded. The thickness of this bed ranges from 20'-50' and consists of one or more members, separated by intervening shale beds. A nodular Ls. stringer from 2" to 1' in thickness occurs uniformly 12 to 18' above the top of the sand thru parts of Tps. 3 and 4S, R's 4 and 5 W. This S.S. is saturated with asphalt, and several seeps of gas and heavy oil occur."

GENERAL ASPHALT.

XVI Charles G. Carlson. "Bitumen in Nonesuch Formation of Keweenawan Series of Northern Michigan". A.A.P.G. Bull. ~~No.~~ 16 (1932) P. 737.

"Abstract. In the upper peninsula of Michigan, in the S.W. part of Keweenaw Point bituminous matter is found in the Nonesuch Formation of Keweenanwan age. This formation consists largely of shale, the bituminous matter being found in the interbedded sand stones, where it is closely associated with native copper and chalcocite".

Mode of occurrence of the bitumen, Found as a cement in sandstone beds and in fractures and fissures relate to cross faulting. Disseminated, associated with native copper. It was present prior to the deposition of the copper. The maximum amount of bituminous cementing material is 2%.

See Herbert Abraham (1929) P. 195, in whose classifications the Nonesuch bitumen fits closely as asphaltic pyrobitumen.

The black shales of the Nonesuch(bituminous) are the probable source of bitumen which is not found in other than this formation. The bitumen is a metamorphosed product, high in fixed carbon, change due to slow oxidation and it is like asphaltites such as grahamite. The writer believes the bitumen was present as asphaltic material before the change.

albertite, grahamite and dikes of Argentine and Oklahoma.

Sidney Powers and F.G. Clapp. Nature and Origin of Oil, gas and bitumen in Igneous and metamorphic rock. A.A.P.G. Bull. vol. 16, No. 8, pp. 717-858. Symposium Aug. 1932.

Oil gas and residues of petroleum ranging from asphalt to graphite are found in igneous and metamorphic rocks---Seepages of oil connected with igneous intrusions led to the discovery of some of the largest oil fields in the world-for one instance, Mexico.

In summing up Powers says: "All of the petroliferous provinces in the world are marked by surface indications of petroleum such as seepages of oil or gas or deposits

ASPHALT GENERAL.

F. G. Clapp. "Fundamental Criteria for Oil Occurrence" A.A.P.G. Bull. Vol. 11, No. 7, July 1927, pp. 682-691.

"Surface indications. They may constitute the principal, and sometimes the only, indication of the presence of oil. Not essential since many field evince none. They are classified in Table II thus: 1-Oil seepages or oil springs. 2. Natural gas seepages or springs. 3-S.S. or Ls. impregnated with petroleum or bitumen. 4- Bituminous dikes. 5-Mud volcanoes. 6-Salt water or deposits. 7-Burnt clay. 8-Sulphur, hydrogen sulphide or gypsum.

Follows a classification of the relative value of each of these indication evidences. Treats of of bituminous matter, ordinarily as an asphalt asphalt, in some places as the solid bitumens, grahamite albertite, or thucolite".

Donald C. Barton. in Journ. Inst. Pet, Tech. vol. 13, pp. 331-348 (1927), discusses a paper by A. Beeby Thompson, with the title "The Significance of Surface oil Indication (Op. cit. pp. 603-634, vol. 12, 1926). He cites all discoveries and the reasons therefor, in the Mid-Cont. In describing Oklahoma he refers to Sidney Powers (O.G.S. 40B 1926) "Oil seepages, according to Powers had less to do with the oil development in Oklahoma than in almost any other part of the world; the oil seepages are practically confined to the outcrop of the Bartlesville sand in the adjacent portions of S.W. Missouri and to the outcrop of certain sandstones in southern Oklahoma. The Wheeler field was discovered because of the prolific seepages there."

In his conclusion Barton further refers to the alleged faintness of surface indications in major fields of Arkansas, Texas, Louisiana, Oklahoma. It is noted that Barton also dates the beginning of petroleum geology at about 1912. It seems to the present compiler that Barton takes a too modernistic idea of the past. As Powers has elsewhere pointed out Mid-Continent surface indications are not scarce locally.

GENERAL ASPHALT

Justus H. Cline. Possible Origin of Graphite in some ancient quartzites and schists in Virginia. A.A.P.G. vol. 16, No. 8 (1932) P. 736.

"Abstract. Graphite which occurs in the lower Paleozoic in the Appalachian Mountains is believed to represent the final stage of metamorphosed petroleum,

The wide distribution of the graphitic particles in the secondarily added silica, and the close relationship of these quartzites with graphitic sericitic schist and slates, strongly suggests that these quartzites may be fossil oil sands, and the slates and schists the metamorphosed equivalents of the mother shales."

ASPHALT GENERAL

S.E. Coomber, "Surface Indications of Oil", Science of Petroleum, Vol. 1 (1938) P. 291.

A summing up of items relating to subject of Asphalt.

Gas Shows. Principally Methane, to a lesser extent, Ethane, butane, etc, and sulphur compounds. CO2 is rare Discusses means of recognition of the gases.
(See Beeby Thompson, Oil Field Exploration and Development (1925) PP. 214-284)

Liquid shows. Usually heavy oil; a tendency toward oxidation and polymerization, so that oil hardens into solid matter. Mixed with twigs etc. makes a dense asphaltic carpet.

Solid shows. 1-Impregnations; 2-Solid asphalt accumulated at the surface; 3-Bitumens of deep seated origin; 4-Wax. The author cites deposits of Athabaska River, also Val de Travers (with 10% bitumen)

Deep seated bitumen is often pure and filling joints etc. as grahamite example in Oklahoma.

Grahamite has black streak, conchoidal to hackly, a high melting point, heavier than water, very soluble in carbon disulphide and chloroform, partly soluble in petroleum spirit, insoluble in alcohol. Occurs in veins and generally contains considerable mineral matter.

Albertite. Lustrous, black, conchoidal, infusible, insoluble in CS2, high % of fixed carbon, low in oxygen.

Indirect surface indications. Sulphur, salt water etc.

(Inserted here only because of a general interest) and for [illegible]

GENERAL ASPHALT.

Roy Cross, Handbook of petroleum, asphalt etc. (1928)

P. 80 Prices of asphalt products. 350 lb bbls. or 425 lb drums and in carload lots.
About 6 bbls to the ton and 4 to 5 drums; 200-300 gals. to the ton. Price per package as above $18 to $28; by bulk, $12 to $23.

Road oil, price per gal. $.0455-$0175.

P. 201. "If the residue contains much wax the crude is known as paraffine base oil, but if naphthaenes, or similar hydrocarbons, predominate it is an "asphaltic" base oil. Practically the asphalt is determined by the solubility of the solid hydrocarbons in pentane and by the gravity and viscosity of the residue.

P. 261. Discussing "batch distillation" the following:

"When asphalt is desired the residue from the gasoline and kerosine may be distilled by blowing superheated steam through it until the desired consistency is reached. Asphalt base oils or cracked paraffine base oils are necessary to make first class asphalt. Frequently, particularly for road oil, the stock remaining after cracking heavy gas oil is run down to a semi-solid or solid consistency. This gives a specially-valuable road oil on account of its high asphalt content, good hardening or drying properties, low visocity and excellent penetration."

P. 516. In discussing road oil manufacture:

"The essential principle of road oil distillation is that it shall distill at a low temperature of 600 F of slightly below. After this temperature has been reached, superheated steam is blown and this carries over the more volatile hydrocarbons at a temperature much below the actual boiling point. This removes waxes etc."

A method of blowing the oil at moderately high temperature, with air. Usually 300 cu. ft. of air per 1 bbl of oil. For delivering air to an asphalt blowing still with temperature at 400 F. and producimg about 250 bbls per day it is required to have 100 H.P. The action of air producesaa more viscous product which is less susceptible to temperature changes. This type is not sufficiently cementitious and ductile to be used for pavement, but is good for fluxing ductile asphalt..

Cross (1928) 2 GENERAL ASPHALT.

Asphalt of pavement a mixture of oil asphalt with dust, sand, gravel or rock, from 6% to 20%. Bitumen or asphalt is commonly applied to the pure asphalt material.

P. 523. Specifications for asphalt cement.

<u>Impurities</u>. water, etc.
<u>Spec. Grav</u>. over 1.000
<u>Fixed carbon</u>. includes free carbon.
<u>Solubility</u> in carbon bisulphide. A measure of purity.
<u>Solubility</u> in carbon tetrachloride, about the same as above. If more than 1½% difference between the two then the substance is shown to have been subjected to

overheating.

Melting point depends on the mixture of dust.

Flash point. measures the volatile hydrocarbons and the readiness to heat decomposition.

Penetration. expressed in degrees, each representing 1/10 mm. or 1/250". Needle 100 gm. at 77 F. in 5 seconds.

Loss by volatilization measures the light hydrocarbons present and the tendency of asphalt to oxidize with loss of ductility and penetration.

Ductility. is measure of the substance to expand and contract without breaking.

All tests should be based on a certain definite penetration regardless of temperature or at 32 F.

Viscosity is measure of ability to transmit plasticity or malleability.

P. 526. Quoted costs of Asphalt pavements in K.C. Mo.

Asphalt concrete with concrete base	$4.46	per	Sq.Yd
Sheet asphalt concrete base	4.76	"	" "
Asphalt macadam	2.30	"	"
Bitulithic	3.07	"	"
Asphalt concrete-rock base.	3.40	"	"

P. 686. Methods of analysis. Apparatus

Penetration. N.Y.T.L. Penetrometer.
Dow "
Humboldt "

ASPHALT GENERAL

Brooks (1936)

Trask & Hammar found practically no organic matter in the form of extractable oil, in sediments now forming

On P. 296, heading "Petroleum in Transition Stages"

"Entirely aside from chemical considerations geologist have stated that the organic source material from which petroleum has been formed must originally have been deposited in the sediments as solid or semi-solid material, the oil or gas now found being sealed by overlying impervious clays or shales. This is consistent with the findings of Trask, whose samples were collected at or near the surface of the sediments.--The findings c Trask, the solid mixtures of Coorongite and balchaschite formed from algae, the discoveries of Treibs, and the observations of Taylor all harmonize with the primary physical requirement postulated by geologists. It might be expected that protopetroleums in transition stages will be found in geologically recent strata in the form of solid or semisolid material.--Certainly asphalts are not oxidation products of petroleum, but rather their oxygen content has survived from the original source material. Treibs also supports this. Asphalts would appear to be either petroleum in transition or 'near petroleums' formed coincident with petroleum. I has often been suggested that the source material of petroleum has been laid down in estuarine sediments. The anaerobic conditions which Treibs requires and Taylor suggests, demand rapid or intermittent sedimentation. The study of the organic material in Tertiary or Recent deposits may fill in some of the gaps in the chemical history of petroleum."

oil shales and asphalts, and asphaltic petroleums, lignites, and canned coals showed only traces of porphyrins. This indicates that the source material of coal was very different from that of petroleum or that the prevailing biochemical conditions were very different.

The discovery of chlorophyll porphyrins in oil shales, asphalts and petroleums suggests that green algae may have contributed largely as source material for petroleums. (See Hackford 1932)---- We can no longer confine our speculations to fatty oils of fish, foraminifera, diatons etc.

Abraham (12, p. 44)

"1777. First exposition of Modern Theory of the Origin of Asphalt. In his 'Elements de Mineralogie' published in 1777, Le Sage (vol. II, P. 96) classified bitumen in the sequence: naphtha, petroleum, mineral pitch, maltha and asphalt, and regarded them all as originating from petroleum oil. This closely conforms to the modern views regarding the classification and origin of bitumen.

Herbert Abraham, Asphalts and Allied Substances, 4th ed. 1938. P. 243.

Grahamite

This asphaltite varies considerably in composition and physical properties, some deposits occurring fairly pure and others are associated with considerable mineral matter. In general it complies with the following:

(This compiler will abbreviate the author's statement to some extent)

Color in mass	Black
Fracture	Conchoidal to hackly
Luster	Very bright to dull
Streak on percelain	Black
Spec. Grav. at 77 F. Pure var	1.15-1.20

Hardness Moh's scale	2-3
Heating in flame	Decreptitates violent
Fusing point (K&S method)	350-600F.
Volatile at 500 F.	Less than 1%
Fixed carbon	30-55%
Soluble in CS2	45-100%
Non*Min insoluble in CS2	Less than 5%
Mineral matter	Variable
Carbenes	0-80%
Sol. in 88 Deg. Pet Naphtha	Tr-50%
etc. etc.	

In general grahamite is characterized by the following:

(1) High specific gravity
(2) Black streak.

Abraham 2

(3) High fusing point.
(4) High % of fixed carbon.
(5) Solubility of non-Mineral matter in CS2

A process has ben preposed for reducing the fusing point by heating the material either alone or with semi-asphaltic residual oil (12-14 B.) in a closed retort at 400 F. for 24 hrs under pressure of 50 lbs. This converts into a product similar to gilsonite."

F.W. Clarke. Data of Geochemistry, U.S.G.S. Bull. 770, 1924, p. 723; The ash of a grahamite from Page, Abraham (12,p. 270-271) Definition

Impsonite.

This represents the final stage in the matamorphosis of asphaltites and asphaltic pyrobitumens. It is characterized by:

(1) Infusibility and insolubility in CS2.
(2) Specific Gravity (1.10-1.25)
(3) High percentage of fixed carbon (50-85%)
(4) Comparatively small % of oxygen (less than 5%) which differentiates it from the non-asphaltic pyrobitumens.

The weathered asphaltites taken from the exposed portions of the vein, where they have been subjected for centuries to the action of the elements, closely resemble impsonite in their physical and chemical properties, and may therefore be classified as such.

Outcrops of grahamite are especially prone to metamorphose into impsonite."

Grahamite 2 cont.

Oklahoma, and analyzed by R.C. Wells in the laboratory of the U.S.G.S. contained 12.2% of V 205.

Further Clarke says, p. 737:

"Between the liquid petroleum and solid asphalt are numberless intermediate substances. Indeed there is no distinct break in the series continuity from natural gas to bituminous coal", See David White, Jour. Wash'n. Acad. Sci. vol. 5, 1915, p. 189.

See also Richardson on these cards.

Asphalt General.

E. Berl, Origin of Asphalt, Oil, Natural Gas and Bituminous Coal. Science, Vol. 80 (1934) pp. 227-28

Cellulose etc. yield at higher temperatures a plastic "proto product" containing various aliphatic etc. substances. Nitrogen and sulphur can be introduced into this proto product, which on incomplete hydrogenation or cracking gives an asphalt-like material. Asphalts and jets are intermediate stages of the transformation of the proto product into oil, and are not formed from hydrocarbons through the reaction with oxygen.

Humic acids yield proto products in coalification.
Lignic acids do not yield materials which can be changed to asphalt.

Fats and waxes do not yield hydrocarbons.
Carbohydrates form hydrocarbon gases on coalification.
Bituminous coal not produced from lignin.

Natural gas asphalt oils and bituminous.coals may by derived from the same substances-the carbohydrates formed by nature. The so-called theory that explains the origin of oil by the heat decomposition of fish, and the organic theory which assumes that bituminous coals are derivatives of lignin cannot be substantiated by experiments.

ASPHALT GENERAL.

J. B. Boussingault. Eldridge (1902) writes of history: on P. 299:

"Boussingault's investigation in 1837 into the composition of Asphalt has developed some results of especial interest. He took for his experiments the viscid bitumen of Pechelbronn, France, at a temperature of 230 C. in an oil bath he separated an oily liquid to which he gave the name "Petrolene" regarding it as the liquid constituent of bitumen, which mingled in varying quantities with a solid substance, "asphaltene" froms the bitumens of different degrees of fluidity. He describes asphaltene as brilliant black in color and luster, with a conchoidal fracture, and heavier than water. Toward a temperature of 300 C. it becomes soft and elastic."

ASPHALT GENERAL.

Benjamin T. Brooks. "Origins of Petroleums", A.A.P.G. Bull. Vol. 20, No. 3, March 1936, p. 288-289.

"Asphalts. All asphalts and all asphaltic petroleums examined contain chlorophyll porphyrins. Treibs considers that the clear asphalt-free oils had los their porhyrin content by absorption during filtration thru absorbent material. These results also show that chlorophyll-bearing plants (algae) existed as early as Devonian and probably as early as Silurian time. Due tc the rapidity with which these chlorophyll derivatives are decomposed by oxidation, Treibs considers that their presence in oil shales, asphalts, and asphaltic oils, indicates that in the original deposition of the organic material anaerobic conditions must have been brought about quickly, as by covering with sediment.

The same consideration definitely excludes the assumption that asphalts have been formed by the oxidation, by air or evaporation, of petroleum. As Treibs states,

'In oils of medium viscosity, with considerable asphalt content, one has a more original oil, while the thinner, lighter colored oils represent natural raffinnates"

He further suggests that one can expect that certain classes of substances will be found very little changed in petroleums and bitumens.

In the case of a Triassic oil shale from near Meride in Croatia, Treibs found 0.4% of porphyrins, corresponding with more than half as much as the chlorophyll content of dried green leaves. In contrast with the relatively high porphyrin content of

ASPHALT GENERAL

David T. Day, "Handbook of the Petroleum Industry." (1922) P. 524.

"Asphalt differs from petroleum oil by containing oxygen in addition to carbon and hydrogen. In many case the oxygen is partially, or even entirely, replaced by the allied mineral, sulphur. In either case the customary treatment of asphalt in petroleum is to remove it, by distillation out of the other oils and obtaining the asphalt as a large proportion of the residuum---It is only within the last few years that results have been accomplished in the breaking up of the asphalts into light petroleums by cracking processes."

P. 715. "Solvents are carbon bisulphide, petroleum naphthas, and carbon tetrachloride. The materials reported as Total Bitumen" are those soluble in carbon bisulphide. "Carbenes" are those soluble in CS_2, but insoluble in CCl_4. "Asphaltenes" are soluble in carbon bisulphide but insoluble in petroleum naphtha. "Petrolenes" are that portion that is soluble in naphtha ~~"Petrolenes" are that portion that is soluble in naptha.~~ With a low petrolene content the asphalt will be brittle if too high susceptible to temperature changes.

P. 798. Characteristics of asphalt. Standard tests.

Physical.- Consistency or penetration test.
Specific gravity.
Ductility.
Melting point.

Chemical. Solubility in CS_2
Solubility in CCl_4.
Volatilization test.
Flash point.
Fixed carbon or residual coke.

The author describes apparatus and methods of tests

ASPHALT GENERAL.

G. H. Eldridge "Oil Gas and Asphalt." U.S.G.S. Bull. 213
1902, p. 296-308. A reprint of previous Rep't.

Hydrocarbons

Gaseous		Marsh Gas
		Natural Gas
Fluid		Naphtha
		Petroleum
		Maltha
Viscous		Mineral Tar
		Brea
Bituminous		Chapapote
Elastic		Elaterite
		Wurtzilite
		Albertite
		Impsonite
Solid	Asphaltite	Grahamite
		Nigrite
		Gilsonite
		Lignite
	Coal	Bit. Coal
		Semi-Bit. Coal
		Anthracite
		Succinite
Resinous		Copalite
		Ambrite etc.
Cereous		Ozocerite
		Hatchettite
Crystalline		Fichtelite
		Hartite etc.

Bituminous Compound

Natural	Mixed with Ls. ("asphaltic Limestone")	Beyssel, ValdeTravers, Loban, Ill. Utah etc.
	Mixed with sil. & sand ("asphaltic sand")	Cal. K'y. Utah etc. "bituminous silica"
	Mixed with earthy matter	Trinidad, Cuba Cal Ut
	Bituminous schists	Cal. Can. K'y. Va. etc
	Fluid	Thick oils from distillation. "Residuum"
Artificial	Viscous	Gas Tar
		Pitch
	Solid	Refined Trinidad asphaltic earth.
		Mastic of asphaltite
		Gritted asphaltic mas
		Paving compounds

G.H. Eldridge. "Asphalt and Bituminous rock deposits." U.S.G.S. Bull. 213 (1902) P. 304-305.

This shorter quoted elsewhere in these cards as a reprint in part of Eldridge's contribution to XXI Ann. Rep. In conclusion on P. 304 under heading "Origin of Deposits":

"The origin of the hydrocarbons and the bituminous compounds may be traced, the writer believes to petroleum. This is a natural inference from chemical relations---for in the passage from petroleum to its derivatives the process may have stopped at any point, with a corresponding development of physical as well as chemical distinctions. But in the geological investigation of the asphaltites, bituminous sandstones, and related materials the view of their origin suggested by

chemistry has been reenforced. The asphaltic earths, and solid bitumens in part, are frequently associated with active petroleum springs, or are found in regions renowned as oil producing-The SS therefore can hardly be regarded other than as storyage reservoirs for the oil, thus received; the Ls. it is sometimes thought may have been the locus of origin as well as the storage.

The asphaltites and closely associated hydrocarbons -ozocerite for example-can hardly have been derived otherwise than by the draining of oil pools or strata richly saturated with oil."

The writer continues describing the gilsonite occurrences in veins etc. and: "The writer believes that the filling of the fissure could have been derived

from no other source (Underlying beds) The origin of the cracks is, of course, well understood. They occur in all formations and in all localities and are a concomitant feature of folding although perhaps at times developed from shrinkage.

The in filling of all reservoirs, whether fissures or sandstones, the investigator is struck with the almost inevitable slowness of the process and the vastness of the area of fine grained sediments that must have been drained to yield the supply absorbed-- After solidification was complete the crushing strains from the readjustment of the strata became manifest in the penicillate structure developed in the asphalt nest to the walls of the vein."

ASPHALT GENERAL.

G. H. Eldridge. "Oil, Gas and Asphalt", U.S.G.S. Bull. 213, (1902) p. 296-305.

This is introduced as a reprinted portion of Eldridge's previous publication on Asphalts etc. (XXI Ann Rep't)

Classification of Hydrocarbons.
by W. P. Blake (modified)

	!Marsh Gas
Gaseous	!Natural Gas
	!Naphtha
Fluid	!
	!Petroleum
	!Maltha
Viscous (malthite)	!Mineral Tar
	!Brea !Chapapote Elaterite

ASPHALT GENERAL.

Carleton Ellis, "Mastic Floor Tile", Ind. & Eng. Chem., Vol. 30, Jan. 1938, P. 20-23

About 12,000,000 lbs of asphalt tile are used in the U.S. yearly. Early plastic floor used a heavy asphalt solution with mineral filler trowelled smooth and allowed to harden by evaporation of the solution. Later separate tiles were introduced the binder being mixed with the fillers. When asphalt was used it was gnerally black but later colors were introduced. The ingredients were mixed at 200 C. The manufacturing processes are described, and specifications involving tests of Impact, flexures, curling, flammability, etc.

A bibliography of 10 trade items.

ASPHALT GENERAL.

Roy L. Ginter. Asphaltites, Asphaltic pyrobitumens and Non-Asphaltic-Pyrobitumens. Tulsa Geological Soc'y Digest, Jan. 21, 1935.

This was a discussion of paper on Natural Asphalt given on same date by E. G. Woodruff, thus in brief.

Table No. 1 gives Ginters ideas of the metamorphism of crude oil to asphalt and asphaltities and asphaltic pyrobitumens. "The evidence supports the Engler theory that asphalts are polymerised petroleum residues, brought about by oxidation, where in the oxygen serves as a catalytic agent.

TABLE NO 1-METAMORPHISM OF CRUDE OIL ASPHALTIC
AND MIXED BASE CRUDE
to
CRUDE ASPHALTS

to ASPHALTITES

ASPHALTITES

Property	Gilsonite	Glance-Pitch	Grahamite
Fracture	Conch	conch-hack	conch-hack
Streak	brown	black	black
f.p.	230-350 F.	230-350 F	530-604 F
F. Carbon.	10-20%	20-30%	53-55%
CS2	98% (Approx)	95% (Approx)	99% (Approx)
Carbon	0-.50%	0-1%	x
Flame	x	x	intum soft-spt
Occurrence	Utah only	Utah only	OklaTexWVa Col.

to

ASPHALTIC PYROBITUMENS.

Property	Wurtzilite	Albertite	Impsonite
Fracture	conch	conch	hack
Streak	light brown	dk,brn-black	black
f.p.	inf.	inf.	inf.
F.Carbon	5-25%	37-40%	75-82%
CS2	5-10%	3-6%	4-6%
Carbon	0-1.5%	x	x
Flame	Soft-burns	Spt-burns	decrep.
Occurrence	Utah only		OklaWvaTexCol Murray Co. Scott Co. Ark Eureka Co. Nev.

(After Hervert Abraham,3d)

Roy L. Ginter 2. ASPHALT GENERAL.

Table No. 2- METAMORPHISM OF PLANT RESIDUES

	(Non-Cellulose)			(High Cellulose)
	to		to	to
			PEAT	to Lignite
	to	to		to
	OIL SHALE	BOGHEAD COAL	CHANNEL COAL	Bituminous Coal
Fossil Type	not carbonized algae fungi	carbon algae fungi	carbonized algae fungi	carbonized angiosperms gymnosperms to ANTHRACITE COAL

On p. 19 Ginter sums up the above:

"The majority of solid bitumens of Okla.

are found in areas of structural deformation and occupy zones of fissures and veins associated with faulting. Similar field conditions are found in the Uinta basin of Utah where the glance-pitch and gilsonite are found in joints and where the country rock is brecciated even though very little vertical displacement exists."

The author gives various Oklahoma examples of metamorphism from weathering which are listed on these individual cards by regions.

P. 21 of above: Discussion of Tables No's 1 and 2.

Table No. 1 Asphalts are considered to be hydrocarbon matter of low fusion point (below 250 F.) and with properties similar to crude oil residues by distillation. Asphaltites are characterized by high fusion points and high solubilities in carbon disulfide.

The hydrocarbon wax Ozocerite in neither class.

Table No. 2 Channel coal may be the end product of either high cellulose or non-cellulose types of plants. High cellulose produce the bituminous coals if the peat decomposition is not sufficient to destroy the ligno-cellulose compounds. Otherwise the resistant tissues (chitin & cutin) are left behind to form cannel or boghead coals.

ASPHALT GENERAL.

J. E. Hackford, Chemistry of Conversion of Algae into bitumen and petroleum and of the Fucosite-petroleum cycle. Jour. Inst. Pet. Tech. vol. 18 (1938) pp. 74-173.

Parker D. Trask, A.A.P.G. 1936, refers to (p.1139) Treatment of algal material with alkali, water and acid gave oily substances resembling the hydrocarbons of petroleum. Similar treatment of petroleum and material from seepages gave products such as pentones, and tertiary amines, which were also recovered from seaweeds. There fore an hypothesis from algae is proposed. The paper is qualitative rather than quantitativ and does not necessarily follow as above.

ASPHALT GENERAL

J. E. Hackford. Nature of Coal. A.I.M.&M.E. Vol. LXV 1920, p. 217.

Definitions.

Bitumen. Natural organic substances, gaseous, solid or liquid, consisting of hydrocarbons and oxy- or thionic derivatives in mixture of same.

Diasphaltene. Portions soluble in ether or carbon disulphide, but insoluble in a mixture in equal parts of etherr and alcohol. Produced by oxidation or thionization of petroleum oils.

Asphaltenes. Portions of bitumen insoluble in ether or ether alcohol, but are soluble in carbon disulphide.

Asphaltites. Solid or semi-solid natural bitum

composed for the most part of asphaltenes or diasphaltenes. May contain some oil and wax. Among oxyasphaltites is grahamite; among thionasphaltites is gilsonite.

Kerotene. Those portions of bitumen insoluble in carbon disulphide produced by gentle heat from asphaltenes. (Kerotene means same as kerogen)

Kerols. Those portions of kerotenes that are soluble in chloroform as well as in pyridine.

Keroles. Those portions of bitumen that are soluble in pyridine, but insoluble in chloroform.

Kerites. Natural solid bitumens composed mainly of keratene. Of the natural examples Wurzilite is a thiokerite; albertite an oxykerite.

These deposits are generally mistaken for coal. See the albertite and Impsonite etc. So-called coals do not have cellulose residue which upon distillation can produce phenols as in the case of true coals. It is conceivable that a kerite produced from microscopic vegetal remains contain some cellulose, but not in sufficient quantity to act as a sponge - would yield phenols upon dry distillation; that would be another connecting link between coal and petroleum. Petroleum oils such as occur in Nature are clearly not derived from coal; but given a quantity of vegetal material petroleum may be produced under a given set of circumstances if no cellulose present, and coal will be formed if the vegetal matter contain sufficient cellulose to form a sponge.

86

ASPHALT GENERAL.

G.D. Hobson. "Biochemical Aspect of the Origin of Petroleum" Science of Petroleum, Vol I (1938)P.55.

Carbohydrate. Hackford (1932) holds pyrobitumen is a partially reduced carbohydrate which on further reduction yields oil. Fucosa, a polymer of fucose, is a constituent of the cell wall of marine algae. Acid hydrolysis analysis of Laminaria digitata extracts gave fucose which formed algarite (pure pyrobitumen) and a series of fatty acids which readily lost all or part of their oxygen to give hydrocarbons. --sulphonic esters broke down yielding sulphuric acid. This hastened the hydrolytic process and unstable tertiary amines decomposed to give oil. He has found tertiary amines in oil decomposition products of algae in natural oils and

seepages. Bitumens from seepages have been hydrolyzed to sugars, and sugars have been found in water accompanying oil. Trask reports pentones, pentosans, and glucose from Lake Maracaibo deposits. It is also ~~is~~ noteworthy that the prolonged boiling of sugars with dilute acids leads to the formation of a somewhat ill-defined substance known as humus hasemanite, coorongite and phlobophanes. Humus bodies are generally of an acid character, dissolving in alkalis to form brown solution.

See anaerobic dedomposition of cellulosic matter.

Benjamin T. Brooks, "The Chemical and Geochemical Aspect of the Origin of petroleum", Science of Petroleum, Vol. I (1938) p. 49-52.

Chlorophyll porphyrins. Low temperature. There must be some unknown catalytic agency. 1-low temperature; 2, Marine plant life; 3-Anaerobic conditions. Differences in composition probably relate to the differences in the original source materials or biochemical history.

Asphalt is a primary substance, not a derivative or oxidation product of oil. Fatty oils are the principal source material of petroleum. The author favors the view that lithification of sedimentaries is entirely due to compaction and deposition of cementing material from solution.

P. 52: "The findings of Trask, the solid mixture of coorongite, and balchaschite formed from algae, the discoveries of Treibs, and the observations of Taylor, all harmonize with the primary physical requirement postulated by geologists. Accordinly it might be expected that proteropetroleums survived from the original source material. Treibs findings are certainly strong supporting evidence. Asphalts would appear to be either petroleum in transition, or 'near petroleums' formed coincidently with petroleum"

W.A.I.M. Van der Gracht, "The Geographical Distribution of Petroleum," Science of Petroleum, Vol I (1938) p. 63:

"Only the accumulations of free hydrocarbons (oil, gases) and their oxidation products, such as asphalt, are considered, not the oil shales, boghead coals and others that only give off liquid oil and gas on heating."

Van der Gracht, Science of Petroleum (1938) p. 60:

"Oxidation must be assumed to include polymerization but the latter appears the major factor in the formation of asphalts--Asphaltic deposits and inspissated oils of a previous cycle of Migration may occur at or near old buried land surfaces along unconformities, and may be overlain by paraffin oils in younger strata. filled by a later cycle of continued, or renewed, migration of petroleum. (Oklahoma City and Lucien oil fields where these asphalts, grahamite, occur in the top of the Ordovician) There is no relation between asphaltic or paraffin oils and absolute depth-- only access of oxygen seems to count, but there is some indication of the influence of calcium salts in the formation of asphaltic products low in oxygen. B. T. Brooks & A. Treibs contest this, on account of the presence of chlorophyll porphryins in many asphalts, derivatives which are decomposed by oxidation. There are asphalts low in oxygen which may have another history."

ASPHALT GENERAL.

V.C.-Illing "The Migration of Oil", Science of Petroleum Vol. I (1938) P. 214.

Absorption. "Certain media, in particular some of the calcareous rocks, have important absorptive effects on oils, effects which are selective in their nature, and which automatically lead to the retention of certain parts of a crude oil during its passage through them. Clark (1934) is satisfied that no important oil movement had taken place though the Ls. that he had examined, because of the lack of absorbed asphalts within them---it can be shown that wet Ls. or sand has practically no absorptive effect and that even highly absorptive earths have their absorptive powers greatly reduced by the presence of small amounts of water."

Illing. "Significance of Surface Indications of Oil" Science of Petroleum, Vol I (1938) P. 294.

A seepage is a depleting leakage. The author classifies Kansas, north and south Oklahoma, as regions where there are small seepages when the oil-bearing rocks approach the surface but they are relatively insignificant, and are not usually in the zone of the prolific fields.

(This compiler does not agree with the conclusion, and believes that the comparison is justified. Surface showings are indeed frequent in parts, such as the south of Oklahoma. Further on P. 294, subject to some doubt the statement: "Oil shows are more common in the folded rocks of Tertiary age."

ASPHALT GENERAL

A.I.M.E. Year Book 1938. References to Ind. Min. 1937. Chap. XXXI, p. 527-532.

Native Bitumens. Abraham's definition. "Substances of variable color, hardness, and volatility; composed mainly of saturated carbons substantially free from oxygenated bodies, sometimes associated with mineral matter, the non-mineral constituents being friable and largely soluble in carbon disulphide."

Native asphaltites such as gilsonite, grahamite and glance pitch, with relatively high fusing point; and comparative insolubility in carbon disulphide; mineral waxes, such as ozokerite distinguished by high content of crystallizable paraffins; native asphalts containing mineral matter and absenceof crystallizable parraffins; bituminous residues from refining.

Gilsonite. Native asphaltite 98%-99.9% pure. Hardness 2. Sp. Gr. 1.01-1.10. Melting point 230-400 F. It is mined in Utah in vertical veins. The bitumen is distilled out of the underlying Green River shale. Used in varnish etc., values av. $20.91 Ton.

Wurtzilite (elaterite) a pyrobitumen. Hardness 2-3 Sp. Gr. 1.05-1.07. Infusible. In Uinta Basin, Utah.

Headted under pressure to 500-580 F. the vapors are condensed and returned to the still where they reduce the material to a substance soluble in carbon disulphide and moderately in 88 degree naphtha. This is known as 'Kapak' or wurtzilite asphalt used in rubber insulation etc. Av. price has declined from $90 in 1931 to $79 in 1935.

Grahamite or Glance Pitch. An Galicia, used for electrical insulation.

Lake Asphalt. Trinidad, marketed by Gen. Asphalt Co. Richardson believes thaat this is derived from heavy oil.

Bituminous rock. Localities are named, and among the Oklahoma producers See Southern Rock Asphalt Co. of Oklahoma City. See also a bibliography/

ASPHALT, GENERAL.

J.S. Jackson. Testing of Asphaltic Bitumens. Science of Petroleum Vol. II, p. 1438-1442, 1938.

Softening (melting) Point. I.P.T. Method A 20; A.S.T. M. 28-36 T. A brass ring and steel ball. Another method is the Kramer and Sarnow method (K & S). The formula for comparing the 2 methods:

R & B = 56/54 (K & S) 7.2 C $\pm$ 1C.

The temperature at which the bitumen has fallen thru a distance of 1 inch is recorded as the softening point, but this must take into account the climatic conditions surrounding the test.

Penetration. I,P,T, Method A 18; A.S.T.M.D. 5-25. The test consists of measuring the depth to which a weighted needle will sink under controlled conditions.

Bitumen is poured into a penetration tin and brought to 25 C. Immersed in water in a thermostatically controlled bath. Penetration is usually taken at 25 C. (77 F) with load of 100 G. acting for 5 secs. Other conditions of temperature and load may be used. The needle is closely specified, mounted in the penetrometer and weighted to 100 g.

The sample is placed under water in a transfer dish. The point of the needle to contact the surface of the bitumen and then allowed to fall for 5 seconds. The extent of penetration is recorded on a dial in hundredths of a centimeter. The bitumen has a penetration of 200 when the needle penetrates 20 mm into the sample at 25 C. during 5 seconds. Penetration softening point relation may be used for expressing susceptibility

Ductility. I.P.T. Meth. A 19; A.S.T.M.D. 113-35. The bitumen is fitted into standard moulds; mounted under water at 25 C. The sides are then detached and the moulds are stretched mechanically at the rate of 5 c.m. per minute until the bitumen is broken. The distance stretched is the ductility.

Loss of Heating. I.P.T. Meth. A 17; A.S.T.M.D. 6-33. Asphalt must not contain much matter that is volatile at average warming temperature. To determine a sample is heated for a period and the loss is recorded. The consistency test is then applied to the residue. The size of the container etc. are standardized. The sample is heated for 5 hours at 163 C.

Jackson, Testing ASPHALT GENERAL. 2

Viscosity. Determinations are carried on at one or more certain temperatures, such as 100C,125C, 150C, 175C, and 200C, with the Redwood or Engler viscosimeter. Measure the time to place at stated temperatures. In the case of Redwood II the time in seconds for 50 ml of bitumen to flow thru the jet is recorded as the viscocity. With the Engler apparatus the time in seconds for 200 ml to flow out is measured and this is divided by the time required for 200 ml of water at 20C to flow from the same instrument. The quotient gives the viscosity in Engler degrees.

Solubility. Asphaltic bitumen almost completely soluble in carbon disulphide. The test determines overheating or contamination also the percentage of bitumen in a mixture of mineral aggregate.

The presence of matter insoluble in carbon tetrachloride but soluble in carbon disulphide may not be due exclusively to overheating as has previously been assumed .

Standard I.P.T. methods are available.

A 13. Asphaltene (soft asphalt)
A 17. Loss on heating (volatility)
A 14. Water estimation.
For the estimation of wax there is no generally acceptable method.

Oil Content of Bitumen. 30 g. of asphaltic bitumen are dissolved by heating in 30 ml. of pure benzol in a 500 ml flask. Then add 400 ml of 60/80 aromatic free petroleum ether; stir, add 30 ml sulphuric acid of

---

exactly 100%. Shake 15 minutes (this causes partial sulphonation) The mixture settles out the acid sludge. Filter into a separating funnel. Wash the residual sludge with a total of 80 ml of petroleum ether. The solution in the separating funnel. Washed with in turn:

(1) 30/50 ml. of 50/50 water and denatured alcohol.
(2) 30/50 ml. of a similar mixture containing about 5 ml. of a 2.5% solution of caustic soda.
(3) 30/50 ml. of water/alcohol mixture as above.

The liquid remaining in separating funnel placed in a weighed flask and the solvent is distilled off. Cooled to 100 C in current of carbon dioxide; the oil remaining in.

Emulsions. A small paddle mixer. The apparatus equipped.

(a) small steam heated container of a definite known capacity from which a required amount of bitumen is run into the mixer.
(b) a suitable stirrer and baffle driven at a controlled speed by a notor.

Acid Value. 5-7 g. asphaltic bitumen is weighted in a 260 ml flask, warmed with 5 ml. of transformer oil until the flux is complete; 100 ml. ethyl alcohol is added. The mixture is boiled for ½ hour under a reflex condenser. This cooled and titrated with alcoholic solution of Alkali Blue 6 Bused as an indicator.

The acidity of the bitumen is expressed as an acid value, i.E. number of milligrams of postasium hydroxide require to neutralize the free acids in 1 g. of bitumen.

Oliensis Spot Test. In connection with detecting the overheating of asphaltic bitumens. The "spot test" depends on the formation of a dark spot from a dispersion of the bitumen in 5.1 times when a drop is placed c onfilter paper.

Frass Breaking Point Test. Measures the tendency to bedome brittle at low temperatures. See apparatus pictured on p. 1440. Not used in the U.S. or Great Britain.

Float Test. A.S.T.M.D. 139-27 measures the tendency to flow. L-shaped two limbs shorter limb is filled flush with asphalt bitumen at 75-100 C. above the melting point. Then placed with the filled limb vertical, where

the temperature can be maintained at suitable level. The flow of asphaltic bitumen from the filled into the empty limb is measured at time intervals.

Recovery of Bitumen. Principle of a method.

(a) Dry representative sampel of the Asphalt bitumen bound material with carbon bisulphide at room temperature; then solution decanted to remove the mineral aggregate etc.

(b) The asphalt bitumen is recovered from the solution by a regulated vacuum distillation with the aid of a current of carbon dioxide.

See description of the apparatus P. 1441.

ASPHALT GENERAL.

Kansas City Testing Laboratory, 1924.

Specifications for Asphaltic Cement.

Asphalt surface mixture, P. 478.

Impurities. No. Water. Homogeneous. Ash, if greater than 1% Spec. Grav. not less than 1.000 at 77. F. Fixed carbon, not greater than 18%.

Soluble in carbon bisulphide at least 99%, at air temperature, and ash free material.

Solubility in carbon tetracholride, at least 98.5% at air temperature, etc.

Melting point, greater than 128 Deg. F. and less than 160 F. (G.E.)

Flash Point, not less than 400F. closed test.

Penetration, needle 100 g. in 5 seconds, shall not penetrate more than 9, nor less than 5 mm.

For cement containing ahs 9.2 mm may be added for each 1% of ash for the true penetration.

Loss by volatilization, not to exceed 2 % and penetration after such loss (not) more than 50% of original.

Ductility, when pulled vertically or horizontally at 5 cm per minute in a bath, a cylinder of cement 1 cm in diameter at the temperature at which penetration is 5mm shall be elongated to not less than 10mm. before breaking.

Further tests K.C. Laboratory Bull 17,1924,p.474

Composition of Natural Asphalt.

Grahamite.

Bitumen	94.1%
Min, Matter	5.7%
Sp. Gr.	1.171
Fixed carbon	5.33
Melting Pt:	Cokes
Penetration	0
Free carbon	0.2
Sulphur(A.free)	2.0
Pet. ether	0.4
Tot.Carb. ash free	87.2
Hydrogen ash free	7.5
Nitrogen ash free	0.2

ASPHALT GENERAL

K.C.Testing Lab. 2 (1924)

Composition of Rock Asphalt

	Cass Co. Mo.	Buckhorn, Okla.
Bitumen	6.9	5.9
Passing 200 Mesh Sieve	20.0	9.0
80	21.0	8.4
50	17.0	9.0
40	6.0	9.9
30	6.5	15.0
20	5.1	8.8
10	7.5	8.0
4	10.0	26.0
Calcium carbonate	92.9	96.0

	Asphaltic S.S. Oklahoma	Higginsville, Mo.
Bitumen	9.2	7.9

Passing 200 Mesh Sieve	1.5	25.7
80	56.5	71.3
40	30.4	3.0
10	2.4	0.0
Calcium carbonate	0.0	0.0

Sheet asphalt pavement Specs. call for two courses thus:

Binders or Bottom Courses.

	Limits	Standard
Bitumen	5½-8	6.0%
Through 200 Mesh Sieve	7-12	8.0%
80	10-20	12.0
40	10-20	15.0
10	7-20	13.0
4	10-20	17.0
2	10-20	16.0
1	10-20	13.0

Thickness 1½" Density over 2.30

Top Course

Bitumen	9.75-11%	10.0%
Through 200 Mesh Sieve	12-18	13.0
80	20-34	23.0
40	20-40	27.5
10	12-35	26.5
4	0	0
2 & 1	0	0
Thickness 1½". Density over	2.17	

ASPHALT GENERAL.

Sidney D. Kirkpatrick, "Marketing the natural hydrocarbons" Eng. & Min. Jour. Press, Feb. 21, 1925., P. 329.

Of the little known minerals Gilsonite is of the most importance. Found near Watso and Dragon, Utah it occurs in perpendicular veins from 3" to maximum of 18' thickness and traceable for 8 miles. In ming considerable timbering is required. Mining is simple. Three kinds of gilsonite. The most valuable attribute is its chemical purity, black luster, and resistance to acids or alkalis. Used for marine paints, steel coatings etc. Roofing paper, floor coverings.

In 1918 U.S.G.S. reported values of $22 ton. In 1924 jet asphaltum was worth $36 ton, selects, $33, seconds $25.50.

Wurtzilite or elaterite of commerce. The U.S.G.S. considers this the trade name. Abraham (1918) says it is a different mineral. Sp. Gr. 1.05, found only in Uintah Co. Utah. It has been worked since 1912. In 1917-821 tons sold at $89 ton. Crude in 1923 was quoted at $120 f.o.b. Chicago. The insoluble, refractory mineral, refined elaterite is called "kapak". Elaterite paint is used as protective for galvanizing when subject to acid corrosion.

Grahamite & Manjak. Differs from gilsonite; is heavier, more mineral matter. Sp. Gr. 1:15 to 1.50; hardness 2-8. fuses above 250 F. Found in Ritchie Co. W.Va., in Colo., Fayette and Webb Co's Tex., Pushmataha, Atoka, and Stephens Co's, Oklahoma. Largest known vein 19'-25' wide and more than a mile long in Jackfork Valley, near Tuskahoma, Okla. reports: "The Oklahoma deposit has been worked extensively and many thousand tons have been removed."

Grahamite is used in roofing and varnishes.

Manjak, Sp. Gr. 1.10 is generally used in paints, protective pipe coverings.

Ozokerite and mineral waxes are substantially free of oxygenated bodies (in this differing from asphalts). Containing crystallizable paraffine hydrocarbons. Sp. Gr. .85-1.00. Melts low, at 140-200 F. In 1918 U.S.G.S. reported production 74,000 lbs, value $45,3991 Used for wax ornaments, dolls, candles, etc.

ASPHALT GENERAL.

H.G. Kugler. "Nature and Significance of sedimentary volcanism" Science of Petroleum (1938) P. 297.

Source rock and origin of petroleum. The author describes migration as of 3 kinds: a-primary, b-secondary, c-relief. Results are: dykes, breccias, blocks, and mud volcanoes.

Fissures miles long, hundreds of feet deep.

"Fissures filled with bitumen alone are described from various oil fields. The occurrence of hydrocarbon dyke; fissures filled with such minerals as ozokerite, or asphaltites, received early attention due to their economic value". (See Oklahoma deposits of grahamite)

Thrust movements- mud flow breccias. General conclustions. Activity of gas. As to subject of fissures the author quotes an early day opinion thus:

"In 1861 Andrews considred that anticlines contained oil because they were full of fissures."

ASPHALT GENERAL.

F.H. Lahee. Oil Seepages and Oil Production Associated with Volcanic Plugs in Mendoza Province, Argentina"

"Abstract. In the eastern foothills belt of the Andes Mountains in western Mendoza Province, a series of lower Tertiary and older strata has been folded and locally intruded by igneous plugs. Seepages of asphaltic oil and dikes or veins of rafaelite, are found associated with the faults and intrusive masses, in such a way as to indicate that these petroleum substances originated from a shale of upper Jurassic age, or from limestone of lower Cretaceous age, or from both. Near the igneous plug Cerro Alquitran, a considerable quantity of heavy oil has been obtained by drilling."

(This is about the same occurrence as named by DeGolyer in Mexico)

ASPHALT GENERAL.

J.S. Miller. "Native asphalts and Bitumens", Science of Petroleum (1938) Vol IV, pp 2710-2727.

(Digested at some length because authoritative)

Classification of bitumens (See also Abraham)

1- Petroleums-liquids, viscous liquids.
2- Native asphalts- solids or semi solid.
   A- Pure or nearly pure.
      Example-Bermudez Lake Asphalt.
   B- Associated with mineral matter.
      Examples:
      (a) Trinidad Lake Asphalt.
      (b) Iraq, Selenitza.
      (c) Rock asphalts of Europe and Am.
3- Asphaltites-Hard.
   A- Pure or nearly pure

97

(a) Gilsonite.
(b) Grahamite.
(c) Glance Pitch-Manjak.

See also pyrobitumens such as albertite.

Analysis of crude Bermudez Lake asphalt.

Water and gas volatilized at 100 C.	30.00%
Soluble in CS2	64.39
Mineral matter on ignition	2.08
Non-mineral matter, insoluble	3.53
	100,00

Weight per cu. ft. 65 Lbs. av.

Trinidad asphalt was discovered by Sir Walter Raleigh in 1595.

Analysis of Trinidad Lake Asphalt (crude)

Water and gas volatilized at 100 C	29.00
Soluble in Carbon disulphide	39.30
Mineral matter on ignition	27.20
Wat. of hydration and absorbed Bit.	4.50
	100.00

Weight per cu. ft. 75 Lbs. Av.

The author discusses various foreign occurrences, and then, on P. 2721:

Texas. A deposit in Uvalde is exploited as Uvalde Rock Asphalt. This is a conglomerate from 10% to 20% hard bitumen and a limestone containing fossils. Uvalde rock asphalt is mixed with softer bitumen and crushed non bituminous rock to produce a road paving material.

Other Texas rock asphalts are located:

County	Soluble in CS2	Nature of material insol. Cs2
Montague	5-11%	Sand and Ls.
Burnet	10	Limestone.

Oklahoma. The deposits in this state consist of asphaltic sands, asphaltic Ls., mixtures of the two, and occasionally shale. Following is list of deposits:

Deposit Location	Soluble in CS2	Nature of InsolCS2
Ralston	5.0	Sandstone
Buckhorn	11-12	Sandstone
"	4-13	Limestone
Brunswick	1-3	"
"	2-11	Sandstone
Sneider	11	"
Emet	10.4	"
Ravia	2.3-13.2	Limestone
Ardmore	9-12	Sandstone

Occurrences in Kentucky, Grayson county and elsewhere, are described.

Rock Asphalt. Uses in paving and as mastic. Specifications.

Gilsonite. Discovered about 1862 and named for S.H. Gilson, a prospector. Derived from rich oil shale. Analysis of Gilsonite:

Color	Black	Fixed Carbon	11-20%
Fracture	Conch-Hackly	Min,Matter less than	1.0%
Luster	Bright	Non-Min insol " "	1.00
Streak	Brown	Sol. in 86 Naph	10-60
Sp. Gr. at 60	1.03-1.09	Paraffine scale	Trace
Hardness	2	Sulphur less than	0.8%
Softening Pt.	250-500F.		

Grahamite. was discovered by J.P. Leslie in W. Va. in 1863 and was named for J.A. and J. S. Graham.

The deposits in Oklahoma were exploited for several years. Following analyses quoted from Richardson (1908)

Grahamite, Physical properties		Oklahoma	West Virgini
	Sp. Grav. OriginalyDry	1.171	1.137
	Streak	Balck	Black
	luster	Dull	Dull
	Sturcture	Uniform	Uniform
	Fracture	Hackly	Ireegular
	Chemical properties.		
Malthenes.Bit.Sol. in 88 Naphtha		0.4%	3.3%
	This is % of Tot.Bit.	0.4	3.37
	% Sol Bit removed by H2SO4	25.0	----
	% Tot. Bit saturated Hydrocarbons	6.32	----

Oil + Oil structures in Okla-Kans. Zinc-Lead field

George M. Fowler,

Bull a.a.p.g, Vol XVII p. 1436-45

Dec, 1933 =

Discusses mine seeps + tar springs briefly - + relation to structure.

Petroleum-impregnated rocks to 500 feet were used for Interstate Compact Com report
Deeper wells were not used but are included to show gravity of oil

L. Jordan
11/1963

Ref. to Asphalt in
Oklahoma
Sources of Infor.
numbered reference on locality cards.

1965

Heavy Crude Oil Reservoirs in US

US Bureau of Mines

IC 8263

Lists 99 fields with data on Okla

1

Sources of Information: Asphalts, Asphaltites, Oil or Gas see pages, found in Oklahoma

Number references on the cards indicate outstanding published matter relating to Oklahoma occurrences.

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2-George H. Eldridge, "Asphalt and Bituminous Rock Deposits", 22nd Ann. Rep't, U.S.G.S. Pt 1, 1901, pp. 262-320.

3-J.A.Taff, "Description of the Unleased Segregated Asphalt lands in the Chickasaw Nation, Indian Territory." U.S.Dep't of the Interior, Circ, No. 6, 1904 p. 7-13.

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7-L.C.Snider, "Rock Asphalts of Oklahoma and Their Use in Paving". Oklahoma Geological Survey, Circular No. 5, April, 1913, p. 22.

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10-N.E.Wolfard, "Roads and Highway Maintenance". Oklahoma Geological Survey, Circular No. 20, (1929)
11-E. G. Woodruff, "Asphalt Deposits of Oklahoma". Emergency Relief Administration of Oklahoma, Dec. 1934, p. 24.
12-Herbert Abraham, Asphalts and Allied Substances" 4th Ed. D. Van Nostrand Co. of N.Y., 1938, p. 149.
13-Various issues of the U.S.G.S. Mineral Resources and Year Book.
14-Carroll H. Wegemann, "The Loco Gas Field, Stephens and Jefferson Counties, Oklahoma". U.S.G.S. Bull. 621, pp. 31-42.
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17-Carroll H. Wegemann and Kenneth C. Heald, "The Healdton Oil Field, Carter County, Oklahoma", U.G.S.G?Bull. 621, 1915, pp. 13-30.
18-Paul G. Shelley, "Accelerated Weathering Properties of Oklahoma Asphalts." Oklahoma Geological Survey, Circular No. 19, October, 1929. 37PP.
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21-C.E.Siebenthal, "Origin of the zinc and lead Deposits of the Joplin Region." U.S.G.S. Bull. 606, 1915.
22-H.A.Ireland, "Mayes, Delaware and Ottawa Counties" O.G.S. Bull. 40NN, p. 490.
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29. Tomlinson, C.W. 1928, Oil and gas geology of Carter Co., Okla: Okla Geol. Survey Bull. 40-Z
30 Riggs, C.H. and others, 1953, Petroleum-engineering study of Healdton oil field, Carter County Okla: U.S. Bur. Mines R.I 4917

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33 Gouin, Frank, 1928, Geology of Comanche County in Oil + gas in Oklahoma: Okla. Geol. Survey Bull 40-DD

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35 Tomlinson, C.W., 1929, the Pennsylvanian System in the Ardmore basin: Okla Geol Survey, Bull 46, pt. 19
36 Bullard, F.M., and Redfield, J.S., 1930, Love and Marshall Counties in Oil and gas in Oklahoma: Okla. Geol. Survey, Bull 40-00

37a Davis, L.V. 1953, Oil possibilities near Idabel, McCurtain Co, Okla.: Okla Geol Survey, M.R. 23, p 13, 14. 4(a)

37b Davis, L.V., 1960, "Geology + ground-water resources of southern McCurtain County, Oklahoma: Okla. Geol. Survey, Bull. 86, p. 14

Sources of Information

Geological departments of Oil Companies, thus:

I The Ohio Oil Co.
II The Texas Co.
III Gulf Co.
IV Sun Oil Co.
V Prairie-Sinclair Co.
VI Gardner Petroleum Co.
VII The Pure Oil Co.

The information always supplied by individual geologists in personal interview only, or by letter. The same generally credited in these cards.

A. H.B.Goodrich.
B. Dr. Ed Bloesch.
C. Frank R. Clark, Ohio Oil Co.
D. W.B.Wilson, Gulf Oil Co.
E. A.F.Truex and Sam Woods, Sun Oil Co.
F. --Kunsman, Barnsdall Oil Co.
G. Oscar Hacher, Helmerich and Payne.
H. Frederic A. Bush and --Gawthrop, Sinclair-Prairie Oil Co.
I. James H. Gardner and Lucian Walker, Gardner Petroleum Co.
J. -- Schutt, Shell Oil Co.
K. J. V. Howell, Adkins Oil Co.
L. Robert H. Wood, Wood Bros. Oil Co.
M. R. M. Garrett, Independent consultant.

N. Frank Gouin, Consultant.
O. Pierce Larkin, Retired Geologist.
P. C. W. Tomlinson, Ardmore geologist.
Q. Ira H. Cram, and Mr. Joe Borden, Pure Oil Co.

In addition to the above local Ardmore oil men have given information thus:

R. Roy M. Johnson, Healdton Oil & Gas Co.
S. George Hollingsworth, Producer.
T. Mike Gorman, Oil investments.
U. J. P. Gill, Sinclair Co., Ardmore.

In Sulphur, U.S.Geological Survey, Field Party.

V. J. M. Gorman, Geologist.
W. George Flint, Assistant.

In Norman, The Oklahoma Geological Survey.

X. Robert H. Dott, Director.
Y. J. O. Beach, Clerk-Secretary
Z. W. E. Ham., Geologist.
Z-1. H. A. Ireland, Geologist.

The notation "O.G.S." on cards and cross reference sheets indicates information obtained at the Oklahoma Geological Survey. These are Field sheets, in part probably from the W.P.A. Statewide Mineral Survey about 1935. The data are not yet published but in March, 1944, were furnished for personal inspection of the present compiler. These include many drill hole records of Mining Companies in Ottawa County showing depths of tar occurrences. In many other counties the "O.G.S." records include analyses etc.

OKLAHOMA ASPHALT. Summary of card index contents. Separate occurrences of our record, of asphalt and allied substances, 4/6/44.

County	Individual Occurrences.
Atoka	20
Caddo	2
Carter	36
Comanche	20
Cotton	1
Craig	1
Cherokee	1
Garvin	8
Grady	1
Greer	33 ?
Jefferson	25
Johnston	18
Kiowa	15
Le Flore	3
Love	14
McCurtain	3
Marshall	8
Mayes	1
Murray	39
Ottawa	28
Pittsburg	3
Pontotoc	13
Pushmataha	10
Rogers	1
Stephens	22
Tulsa	1
Total 26 counties	297

OKLAHOMA ASPHALT

Prof. Eli Bowen "Coal and Coal Oil.", Philadelphia (1865) P. 138.

"On the false Washita River, toward the Washita Mountains, Lieutenant Johnston* (1845) met with a dark sandstone, having a vertical dip, out of which throughout its course a great quantity of bitumen has flowed. A specimen of the liquid bitumen has the consistency and appearance of common tar. It occurs as a mineral oil or petroleum on the surface of a spring near that place. This spring is in the vicinity of Granite upon which the oil doubtless rests.

(No writing of Johnston has yet been seen, but in absence of more definite information as to location it is believed that the surface showings may refer

* Probably A. R. Johnston.

to the ones in Carter county, south of the Arbuckles. On the other hand the oil see-pages may be those near Lawton or Gotebo.)

9

OKLAHOMA ASPHALT.

Charles E. Bowles, "Oklahoma Petroleum - An Industrial Survey, Okla. Geol.Surv. Bull. 40 AA, Mar., 1928, p. 91.

"Vast Deposits of Asphalt. While asphalt is not so directly connected with crude oil as are casing-head and natural gas, the asphalt deposits that are so widely distributed throughout S. Okla. are, nevertheless, a part of the oil industry, and should be taken into account in any discussion of the State's petroleum reserves.

The Oklahoma Geological Survey has estimated that these deposits contain unnumbered millions of tons of asphalt - enough to furnish paving material for all the streets and public roads of Oklahoma. In the report of the U.S. Bur. of Mines for 1924 the output of native asphalts is about 18,000 tons, with a value of $80,000.

This negligible amount of development of this vast resource only serves to emphasize the future possibilities of Oklahoma asphalt whenever the situation becomes favorable for the development of these deposits."

Bess Mills-Bullard, "Digest of Oklahoma Oil Fields", O.G.S. Bull. 40, P. 106;

Locality, Asphaltum. Spec. Grav. 20 B. Asphaltic Oil. Date of opening, 1913. The territory between the Healdton field and the asphalt deposits in Sec. 32,-3S-2W, and development started in this area at the time Healdton was opened. Carter Co. suggested favorable prospects to operators.

Sidney Powers, O.G.S. Bull. 40 G, 1926.

"The discovery of Ordivician fossils at Healdton in Nov. 1916 when a producing well was shot in the oil sand, was the first proof of possible production from older rocks (although asphalt occurs in Ordovician strata in the Arbuckle Mountains) or of the complex underground structures now known as "buried hills'".

Hutchison refers to a report by Ben Belt. See another card.

OKALHOMA ASPHALT.

W.R.Crane, "Asphaltic coals in the Indian Territory" Mines and Minerals, Vol. XXVI, No. 6, p. 252-254.

The most extensively operated deposits are 25 miles W. of Atoka; one at 5 Mi. N. of Loco; and one near Page. The Loco deposit described P. 253-255. Three veins are opened on this, the Sanner claim which is 80 acres in area. The vein has been traced for ½ mile by shafts and test pits. Strike 47 E. of N. and pitch of 80 to nearly 90 NW. Parallel to this and 300' to the S. is a second vein tested for ¼ mile. These two veins are cut by a third one which strikes 45 W. of N. also pitching 80 to 90, this time to the W. This traced for 300'. Still another vein running parallel to the first, at 250'N. from the middle one.

There is a zone of fracture not less than 600' wide through this part of the country. The pitch of all the developed veins about 85. The greater part of the deposit is barren; the East extension is most productive. There are 4 shafts in ½ mile from the cross vein, to depths of 60' to 100'. Irregularities, squeezing by the lateral compression of a viscous deposit. Fissuring rather than faulting is the general condition. Lenticular pockets. The rock formations dip 2 Deg. to E. of S.

Character of the asphaltic coal is friable. Its origin: "fissures were produced by the folding that tapped the oil sands or pools." The prime transporting agent was water(P.254) "Whether the contents of the sand tapped were crude petroleum or possibly a still more viscous product,is a mooted question. The answer might vary with

OKLAHOMA ASPHALT

Roy Cross, Handbook of Petroleum, Asphalt etc. (1928)
Classification of solid bituminous substances P. 530. Substances from all regions are arranged in a Table with consists of 5 clases. Of these Oklahoma appears in Class 3 and Class

Class 4; substances freely soluble in carbon bisulphide and slightly soluble in petroleum ether under 40%. This class includes coal tar pitch, grahamite, glance pitch, and manjak.

Class 4.; substances slightly soluble in carbon bisulphide. This includes Albertite, Wurtzilite, Elaterite, Impsonite.

Following partial analyses in comparison with others

each particular case, and would not in the least affect the method and degree of filling of the fissure."Orographic action subsequent to the forming and consolidation of the vein content. The author quotes a W. Va. case in corroboration of the idea that the material's source is in oil sands. Methods of prospecting and mining is described; stripping and test pits. Quotes the Miller mine at Kosoma; ditches 10-30' deep at 20-25' apart, normal to the vein. Costs about $1.00 ton (water etc.) The market averages $15 ton F.O.B. R.R. from which $3.50 haulage, $1 mining; leaves profit of $10.50. Shipment is via C.R.I. and P.RR, at distance 20 miles. Uses are in paint, varnish, pipe coating, masonry walls, roofing material, fuel. (Vanadium occurrence not at Loco, but reference from Page grahamite Clark Geochem, Bull 770 p. 723.

	Class 3 grahamite	Class 4 Impsonite
Spec. Grav.	1.171	
Ash	5.7	10.7
Sol. in CS2	94.1	1.6
Sol. in 88 P.E.	0.4	0.0
Melting point	Dec.	
Fixed carbon	53.3	

14

OKLAHOMA ASPHALT

Robert H. Dott. Director's Biennial Report of the Oklahoma Geological Survey, 1935-1936, p. 23-24.

"Asphalt is also an important road surfacing material which has been used extensively. It lends itself to many types of specification and design, and the cost depends upon the type desired. It is of 3 types; native rock asphalt, native sands asphalt, and liquid asphalt. Quantities have been estimated in cubic yardsand samples have been analyzed in the Norman laboratory to determine the quality. Virtually all known deposits have been examined and many new ones discovered Table V on p. 24 shows the quantity of rock asphalt by counties.

14

Table V. Estimated quantities of rock asphalt deposits found and tested by State Min. Surv.

	County.	Cubic Yards	
	Atoka	1,130,000	
	Carter	2,100,000	
Coal	Coal	1,300,000	
	Comanche	11,200,000	
	Jefferson	1,175,000	
	Johnston	3,259,000	
	Love	1,450,000	
	Marshall	1,225,156	
	McCurtain	1,752,600	
	Murray	6,700,000	
	Ottawa	17,803,036	Tar-bearing rocks in zinc mines not easily accessible.
	Pontotoc	1,900,000	
	Pushmataha	1,100,000	
	Stephens	600,000	

See no evidence here presented of tonnage and net bitumen values.

OKLAHOMA ASPHALT

C.W.Honess. Atoka, Pushmataha, McCurtain, Bryan and Choctaw Counties, O.G.S.Bull. 40 R, 1927. pp 96-103 under heading "Asphalts and Related Substances" is a description of the asphalt deposits of various parts of Oklahoma. These are referred to on individual cards here. However, some ofthese are repeated because of the general interest. (a) next card -- p.97 -----

The occurrendes are of two types: (1) fissure veins, and (2) impregnated sandstones. The veins have resulted from the solidification of drying up of liquid petroleum which welled up from beneath and for a time flowed fom cracks or crevices in the ground, but which eventually ceased to flow and that which remained in the cracks and near the surface became hard. The crevices

were widened by the flow of the oil and asphalt, locally up to 50' but usually the width is from 2 to 4'. The length of such veins may be one mile, as in the case of the Sardis occurrence, but any single continuous body of grahamite or gilsonite ordinarily does not extend more than 100 or 200 years. The veins are vertical or nearly so and are usually parallel with the bedding of the shales and SS in which they occur. All the known veins of large size are found in the Stanley formation of Carboniferous (Mississippian) age. The Jumbo asphalt vein and the Sardis vein are typical of this class.

The asphaltites or impregnated SS. which make up the second class of the two general types of asphalt deposits, occur most conspicuously in the valley of McGee Creek near Redden where ledges of SS, 4' to 6'

(a)

P. 97. "There is asphalt in the Potato Hills, west of Talihina, and in the cherts at Stringtown, and doubtless in many other places as yet undiscovered, in the Ouachita Mountains.

thick, saturated with asphalt, come to the surface dipping at fairly steep angles, up to 45 deg. ---As above mentioned the SS, at a depth of 600' contain fluid oil, which indicates that the present dried out exposed edges of the sand bodies were at one time the source of much exuding petroleum."

The author proceeds to discuss (pp 99,100) the origin of the asphalt. In this connection quotes Taff and Reed, on occurrences in Trinity of Marshall Co. and its origin there in carboniferous, also quotes Miser & Purdue on Arkansas occurrences in Trinity of Pike and Sevier counties. Here the origin in carboniferous is also shown by occurrences in carboniferous of adjoining Oklahoma. The authors do say, "There is, however, no direct proof that some or all of the petroleum did not

originate in the basal part of the Trinity formation, which contains some fossiliferous Ls." Further theo opinions are quoted of Hopkins, Powers & Robinson on origin of the Trinity sand oil of Madill, Marshall County; that it has migrated into the Trinity from either the Caney shale or the Glenn formation.

In summing up Honess states the asphalt and heavy oil in exposed carboniferous of Ouachita Mts may have had a deeper source. While there are migrated occurrences above it "The bulk of the asphalt is seen to be in the Stanley shale". This is not inherently petroliferous. Certainly flints and shales below the Stanley are not source beds." There is, however, a formation known as the Caney shale lying on top of the Woodford chert and shale in N. Atoka county and in S. Pittsburg County,

that the asphalt in Atoka County could have originated in the manner suggested, it is difficult to see how the Jumbo and Sardis asphalt veins and others still farther east could be derived from so distant a source."

The author (p.102) discusses the overthrust theory, and:

"The outcropping SS ledges in the vicinity of Redden which are saturated with asphalt and which at 600' carry fluid petroleum may be only a means of escape of oil which in reality comes from the Atoka formation buried beneath, or from the Hunton Ls., or "Wilcox Sand" and not from the formation in which the oil is found. If this condition exists the outcropping Stanley, which dips at high angles, may extend downward, possibly a mile or more to a low angle fault plane, and beneath the fault there might be an oil-bearing formation of the Arbuckle

Honess 3

and this formation is marine in origin, fossiliferous, and may be considered as a likely source of petroleum," Refers central Atoka county where is much asphaltic SS in the Stanley, the interference by the Choctaw thrust fault. "Beneath the Atoka are Wapanucka, Caney, etc., which are the Arbuckle Mtn. series. These are marine, in part petroliferous and may have furnished the asphalt" The rocks east and west of the Choctaw fault are badly broken or overturned for two miles on either side. The upthrow is on the E. side, and the Talihina chert in surface contact with the Atoka formation. "Under these circumstances, petroleum from older petroliferous rocks (Wapanucka, Caney) should find its way into the Talihina chert and Stanley Sh. and SS. which have been thrust against and upon the petroliferous series, but granting

Honess 4

facies, in contact with the faulted off edges of the outcropping SS. Such structural relations would permit escape of oil at the surface as into the Trinity farther south.*** Moreover it is not to be assumed that the Arbuckle facies was necessarily deposited as far east as the Sardis asphalt vein in N. Pushmataha County, certainly not necessarily as far east as the Page asphalt vein in southern LeFlore County. Nevertheless carrying out the idea of a large overthrust fault, and recognizing that some of the carboniferous rocks (Atoka) are locally petroliferous, there is the possibility that the Sardis asphalt and the Page asphalt came up from an overridden mass of Atoka formation, if not from some older Paleozoic Rock.*** We may say that since there is no adequate source for petroleum in the Stanley-Jackfork sequence nor in

others of the older rocks of the Ouachita series, these dikes and seepages of asphalt must be leakage from the overridden and deeply buried beds of the Arbuckle facies, --if the asphalt in question is not derived from some deep-buried petroliferous rocks of the Arbuckle facies, I see no reasonable explanation. So far as asphalt is concerned it is not necessary to assume the overthrust extends farther south than the valley of the Kiamichi above Antlers, for any asphalt S. of that latitude in Oklahoma occurs in the Atoka formation where it might be indigenous, or is found in the Trinity Sand derived from seepages, presumably from the Atoka."

OKLAHOMA ASPHALT

F.H. Lahee "Lateral and Vertical Migration of Oil"
Problems of Pet. Geol. (1934) A.A.P.G., p. 412.

Pores in the Arbuckle Ls. believed to be caused by solution when that formation was above ground water elevation. At the same time it would appear that oil was seeping out of the Simpson sands, for there are numerous evidences, found in the drilling, of asphaltic sands supposed to be of Simpson origin at the base of the Cherokee, resting immediately on the surface of unconformity-----However, the asphaltic sands, probably old seepages, in the basal Cherokee, suggest that there was lateral movements of oil thru the Simpson sands before Pennsylvanian deposition.

(See occurrences in Cherokee, in Miami Dist.

----Hanraty, Second and Third Ann. Rep't. Oklahoma Inspector of Mines, From July 1, 1909, to June 30, 1910.

Report of production of Asphalt.

	No.tons	No.Men	No. Days
Chickasaw Asphalt Co. Ardmore	90	12	20
Choctaw Asphalt Co. Jumbo	2032	11	218
Fort Smith Asphalt Co, Tuskahoma	3770	8	250
	5892	31	488

See other cards for all the reports available in the University Library at Norman. The Okla. Dept' of Mines is careless in sending out its publications.Many of these Ann. Rep'ts. are not on the shelves at Norman.

Oklahoma Asphalt.

W.K. Patterson, Inspector of Mines, Oklahoma. 2nd and 3d Ann. Rep't, 1908-1910. P. 93.

Fort Smith Asphalt Co., Mine No. 1. Tuskahoma.
This is an asphalt mine. It is situated about 10 miles NW. of Tuskahoma. The slope was driven down 125' where they strick a fault, which cut the vein out. There are 2 entries running at right angles to each other off this slope. They are also in the fault. The Co. at present (1910) is drilling to the dip of the slope in order to find out the thickness of the fault. The vein increases from4 to 16'. Work is at present (June 30, 1910) suspended.

Fort Smith Asphalt Co., Mine No. 2. Mine No. 2 is also a slope. It is a new development and is driven down about 36'. About 6 men at work, producing 15 tons of asphalt per day.

Choctaw Asphalt Co., Jumbo, Oklahoma. This is a shaft mine; the shaft is 90' deep. The mine now idle.

Chickasaw Asphalt Co. Ardmore. This is a strip pit mine. This Co. successor to Southern Asphalt Co.

American Mineral Wax Co., Woodford. This mine is also a strip pit, and it has been idle in 1909-1910.

Dep't of Mines Fifth Ann. Rep't, July 1911 to June 1912. Tabulated production of Asphalt, p. 104.

Company		Laborers. No. Men Days	Tons
Brunswick Asphalt Co.	Ardmore		13,372
Downard Asphalt Co.	Ardmore		3,079
J.S.Downard	Sulphur		1,099
Gilsonite Roofing & Paving Co	Ardmore		614

Dept. of Mines 2 (cont'd) 22

Company	Address	Laborers. No. Men	Days	Tons
Ft. Smith Asphalt co.	Tuskahoma	9	81	1,542
Rock Creek Nat. Asph. Co.	Sulphur			2,127
	Totals	9	81	21,833

Mines Ann. Rep't (25th) to 1932. The asphalt mines at Dougherty in Murray County did not report any production for 1932.

Dep't of Mines, 28th Ann. Rep't, June 30, 1935

The asphalt mines at Dougherty did not report any production this year.

Dep't of Mines 30th Ann. Rep't., June 1937.
Table, P. 38.
Production of asphalt for the year.

Company	No. of Mines	Men	Days	Production Tons
Southern Rock Asph. Co. Murray County	1	250	186	208,011
Southern Rock Asphalt Co. Carter County	1	35	252	13,762
Total				221,773

The asphalt in Oklahoma supplies most of that used in road material.

Dep't of Mines Ann. Rep't (33d) June 30, 1940.
P. 52. Production of asphalt in Oklahoma.
Southern Rock Asphalt Co. Murray Co.; 1 mine; 144 Men; 151 days; Produced 106,539 short tons.

Dep't of Mines, 34th Ann. Rep't, June, 1941. No asphalt mentioned.

Dep't of Mines, 36th Ann. Rep't, June 1943. Mention of a new asphalt Mine Pushmataha. Sup't T.J. Pate, Clayton, Oklahoma. No production.

P. 30. Asphalt production; Southern Rock Asphalt Co. Sulphur. Open pit produces 286,808 short tons; worked 214 days; employed 150 men. The asphalt is used mainly for road materials and airports.

Insert the following report of Robert M. Brown, Chief Mine Inspector "35th Ann. Rep't, June30, 1942." (p.59)

Operating Co.	Mines	Men	Days	Production	Explos.	Ac
Barndollar & Crosbid, Ada, Okla.	1	60	41	33,390	13000	0
Southern Rock Asphalt Co. Sulphur.	1	113	13	97,448	26000	0
	2	173	54	130,838	39000	0

OKLAHOMA ASPHALT

D.W.Ohern, Mineral Production Oklahoma from 1901 to 1911 Okla. Geol. Surv. Bull. 15, Pt. 2, 1912, p. 34.
Asphalt. Prior to 1903 the production of asphalt in Oklahoma was limited because there was little paving in the SW. Beginning in 1903 the production has advanced. See Table. The writer cannot disclose the figures confidentially given for 1911, but there is some increase over 1910.

In view of the enormous quantities of rock asphalt, and the purer varieties such as gilsonite and grahamite found in the State, the annual output is small. This is because of competition with asphalt refined from oil, and with the Trinidad product. Also an expert a few years ago (? probably Richarson) stated that Oklahoma asphalts were not suitable for paving. This had bad effect upon opinion, but on the other side see the excellent streets of Ardmore. The future of Oklahoma asphalt is now assured.

Value of asphalt in Oklahoma.

1903	$28,150
1904	37,516
1905	27,790
1906	18,461
1907	20,770
1908	23,820
1909	48,130
1910	65,244
1911	------
1912	------

25

Value of Asphalt in Oklahoma (cont'd)

1913	91,416
1914	------

Includes other material gilsonite grahamite

26

Oklahoma Asphalt Tests. Ref. 19, Table.

TESTS OF OKLAHOMA ASPHALT SAMPLES
Tabulated by
Clifford Richardson
Reference No. 19
(1910)

Sample No	Sp.Gr.	Loss at 100	Bitum %	Inog.	Sol. in Naphtha 88	62	Coke residual	C	H	S	N	Diff.
53788	1.184	0.4	90.5	1.1	.8	1.1	56.4					
74989			96.2	3.00	.7		52.9	83.90	7.14	2.24		6.72
74990			95.7	4.1	.4		51.4					
74991			95.5	4.2	.2		52.6					
74992			95.2	3.9	.7		52.9					
74993			93.5	5.0	.7		52.0					
74994			93.0	5.3	.7		52.0					
114041 (a)		0.1	92.4	6.6			49.1	(Bit. insol. in turpentine 43%)				
(b)		0.1	95.4	3.8			51.1			1.56		
(c)		0.0	94.0	6.0			49.1			1.52		
(d)		0.2	93.3	6.7			48.5			1.40		
76503			99.7	0.3	6.8	8.2	43.5					
76504			95.7	0.3	4.5	5.4	45.7					
81424			99.4	0.6	6.8		44.0	(Bit. insol. in CCl4, 58.2%)				
80847		0.6	76.4	23.6	6.3	7.5	39.4					
80824		0.7	83.7	7.1	5.0		41.0					
59398			96.8	2.6	0.9	1.0	54.0					

OKLAHOMA METAMORPHOSED GRAHAMITES OR ALTERED.

Sample No	Loss at 100	Bitum %	Inog.	Sol. in Naphtha 88	62	Coke residual
69235	0.5	41.6	0.03	8.4	8.9	48.0
69482		41.1	.2			42.6
69242 (a)	1.6	3.6	3.3	0.00	0.0	75.0
(b)	0.3	2.6	0.6	"	"	77.0

27

Oklahoma Asphalt
Identification of samples tested by Richardson (Ref. No.19)

IDENTIFICATION OF SAMPLES OF OKLAHOMA ASPHALT
Tabulated by Clifford Richardson
Reference No. 19

Sample No.	Description.	Fracture.	Luster.
53788	Sampled by Taff, 1901. Impson Valley on a branch of Tenmile Creek. W. Side of the valley in Sec. 21-1S-15 E.	Hackley	Lustrous.
74989	Impson Valley, in 1904. Old slope 24'	"	
74990	" " " " " " 40'	"	
74991	" " " " " " 70'	"	
74992	" " " " " " 90'	"	
74993	" " " " " " 110'	"	
74994	" " " " " " 135'	"	
114041 (a)	Impson Valley from stock of the Barber Asphalt Paving Co. N.J. 4 samples. In 1909.	Hackley	Very Dull.
(b)	" " " " " " "		Dull
(c)	" " " " " " "		Sub lustrous
(d)	" " " " " " "		Lustrous
76503	Williams Mine, McGee Creek on W. side in SW Sec. 23, 1 N R14E. Taff in 1905.	Schistose Hackley	Sub lustrous
76504	" " " " " "	"	Lustrous
81424	South McAlister, 1905. Choctaw Min. & Dev. Co.	"	Lustrous
80847	LeGrand deposit in Red Beds near Loco. This has infiltration of pyrites in crystals recognized by the naked eye. Taken in 1903	"	Dull
80824	$12\frac{1}{2}$ Miles SE of Stringtown on the S. edge of Boggy Valley. Sample taken in 1905 from Ordovician-Silurian shale.	"	Sub lustrous Lustrous
59398	Locality ?? taken in 1902.	"	

OKLAHOMA METAMORPHOSED GRAHAMITES OR ALTERED.

69235	Unknown locality taken in 1904.		
69482	South McAlister, in 1904. Choctaw Min. & Dev. Co.		
69242 (a)	Black Fork Mountain near top of outcrop.	Schistose	Sublustrous
(b)	" " " in the entry running in on the vein from the S. side of the hill at a point 15' below the surface.	"	"

OKLAHOMA ASPHALT

C.W. Shannon, Mineral Resources of Oklahoma from 1901-1914, Okla. Geol. Surv. Bull. 22, Dec. 1914. P. 100.

Asphalt varieties are of 2 classes:

1-Albertite, anthraxolite, ozokerite, grahamite, lake asphalt, gilsonite, impsonite, manjak.
This class is free from impurities; asphaltite.

2-Shale asphalt, lime asphalt, sand asphalt.
This class consists of bituminous rock.

The author describes uses, paving mixtures, etc.

Location of the deposits. With one or two exceptions the deposits are in the S. 1/3 of the State. Asphalts (S.S. saturated) of commercial importance occur near Lawton. Not yet opened; a quarry near Elgin recently reopened.

In the N.E. part of Jefferson county on 160 acres of segregated asphalt land is underlain by a ledge of asphaltic material, 25' thick. This has been shipped from Comanche and used for paving.

In the S.E. part of Stephens Co. is a place where the asphalt has worked up along a fault and impregnated S.S. on either side.

In the Ardmore district asphalt occurs as impregnations of the Glenn; the asphaltic S.S. dips steeply. The deposits are known to number 15.

Arbuckle District, In Murray Co. rock asphalts Ls. and S.S. of the Ordovician. The Buckhorn and Brunshwick Districts.

In Johnston county there is one deposit at Ravia, in a Ls. 5-6' thick unevenly impregnated. The asphalt

has been used for paving, the quarry is not now (1914) being worked.

In Pontotoc Co, at Fitzhugh, Ahloss, Franks, Ada and Roff. The deposit at Ada is 100 acres with asphaltic rock to 80' depth. The product is quarried Pavements at Ada, Lawton, Tulsa, Holdenville, Hugo, and in Sherman and Paris, Texas, from this material. The deposits are great and rich.

Asphalts of the Red River District occur as unconsolidated in the Trinity Sand. Found in Love, Marshall, Bryan and McCurtain counties. There are 7 occurrences in Love County and only 1 is worked. There are also 7 in Marshall County.

In the Ouachita Mountains there are both rock and pure asphalts. In Atoka and Le Flore counties are grahamite at Jumbo and Page. The pure asphalts occur generally along fault lines. Some could be used for paving but more valuable for other usages. The author repeats procudtion table of Ohern (1912) adding 1913, Value $91,416.

30

OKLAHOMA ASPHALT.

Paul G. Shelley. "Accelerated Weathering Properties of Oklahoma Asphalts." O.G.S. Circ. No. 19, 1929 often referred to as No. 14 in these cards. The "Purpose" is outlined on P. 5:

"Herbert Abraham says, in connection with discussion of the slight effect caused by air blowing of extracted natural asphalts from Oklahoma; "This is further corroborated by the authors observations on paints made from the extracted sand asphalts which were found to be highly resistant to atmospheric oxidation. "The object of this research is to develop and apply an accelerated weathering test to these products and to either prove or disprove this statement, by bringing about a comparison

and some other naturally occurring asphalts.

of their weathering properties with ~~those of petroleum~~. There are in Oklahoma, vast deposits of both sand and rock asphalts varying in content of bitumen from a trace up to about 15% averaging possibly 6 or 7%. The extent of these deposits has been estimated from 1 to 13 million tons (See L.C. Snider 1913)

At present (1929) very little natural asphalt is being used. There are 3 quarries in operation, 2 at Dougherty in Murray County, and 1 N.W. of Ardmore, Carter Co. However, there is a vast field for the use of asphalt other than paving.

The field includes the manufacture of bitumenized roofing material and all types of asphalt paints and protective coatings for the painting of steel, ship hull, etc. All of these services require the greatest available weathering resisting qualities."

Continues, but here mainly are quoted specific sampling and tests, in the following cards.

OKLAHOMA ASPHALT.

See also Marshall County.

J.A.Taff & W.J. Reed, "The Madill Oil Field", U.S.G.S. Bull. 381. 1910. P. 513. (An early opinion of note) "Probable Source of the Oil. The Trinity sand is known to contain petroleum or bitumen, a residue o of crude petroleum, at various localities in Arkansas and Oklahoma (southern) and Texas. At all the localities where this has been found the Trinity is several hundred feet thick. It is a beach deposit contains scanty remains of organic life either vegetable or animal. This Ls. member in the central part of the formation and some silicified wood, but nowhere is there sufficient evidence of occurrence of organic matter to substantiate that the oil originates in the formation that contains it.

In SW Arkansas and in N. Texas as well as in S. Oklahoma thick deposits of Carboniferous rocks that contain oil residues ~~underlie~~ the Trinity sand. Any oil in the carboniferous strata would, in the course of time be conveyed upward ~~and~~ would either lodge in that sand or find an exit to the surface. There seems at present no other reasonable explanation than that the oil of the Madill Pool had its source in the underlying Paleozoic strata.

Whether the oil, in its present position near the base of the Trinity Sand is contiguous to the original oil bearing strata of the subjacent rocks, or whether it has migrated laterally may possibly be determined by the drill. The inference is that any such original oil bearing rocks would be found to trend in a NW-SE direction parallel to the Arbuckle Mtns."

Memo from U.S.G1SS.Bull. 381. Analysis of petroleum Oklahoma and Kansas, by D. T. Day. P 495. The asphalt was determined by the Holde's method: weighing off 1 gm. of residuum, slaking this with 40 cc of gasoline free from unsaturated hydrocarbon which was heated between 65 and 95 C. After shaking this stands 48 hours ar and the precipitated asphalt is dissolved in benzol, dried at 105 and is weighed.

(Note the logic of the trend as proposed before the existence of subsurface points. See also early theories on Wheeler field Carter Co.)

OKLAHOMA ASPHALT.

U. S. Bur. Mines Min. Resources 1916. p. 270.

"The Oklahoma output in 1916 of natural asphaltic material, which amounted to 15,431 tons valued at $112,555 consisted of grahamite from two properties in Pushmataha Co. and one in Atoka, and of bituminous rock from two properties in Pontotoc Co. A new source of grahamite was found in July, 1916, near Jumbo, Pushmataha Co. The discoverer, Mr. John D. Townsend of Hugo reports it to be of excellent quality; in a vein, shows surface extent of 400' to N.E. and width of 2". At 20' depth the vein is reported 14" wide. Further efforst are to be made to determine commercial values."

C.C. Osbon, U.S.G.S. Min. Res. for 1918, Pub in 1921

In Oklahoma there were 3 operators. A small output by the Fort Smith Asphalt Co. in Pushmataha Co. Extensive operations began in Murray Co., by the Continental Asphalt Co. of Oklahoma City. This Co. controls a deposit of good bituminous Ls. and is preparing to market on a large scale. Oklahoma furnished much residue asphalt from crude oil. Ark. had no production in 1918.

1921. W.K. Cottrell, U.S.G.S. Min. Res. 1921 names the folloing producers of rock native asphalt.

Continental Asphalt & Petroleum Co. Okla. City
Fort Smith Asphalt Co. Ft. Smith, Ark.
J.O. Tipton, Ada, Okla.

1928. A. H. Redfield, U.S.G.S. Min Res. writes that in Murray Co. Steeply dipping beds of bituminous Ls. ar are quarried and some in Johnston and Pontotoc counties. In 1928 only one producer, namely, Westen ern Paving Co. operating near Dougherty, Murray Co. The Bituminous limestone contains 3-8% bitumen.

1896. E.W. Parker, U.S.G.S. Min Res. p. Oklahoma Territory Geo. F. Devereux of the Oklahoma Oil & Asphalt Co. repotts large bituminous deposits but not developed on account of business depression for the past few years.

1897. E. W. Parker, Min. Res. p. 187. New mines opened in Okla. and Ind. Terr'y. Added 280 tons.

P. 194. Indian Territory. About 100 miles E. of S. from the Oklahoma deposits, in the Chickasaw Nation are deposits of bituminous Ls. and S.S. The first production was reported in 1897, consisting of 200 tons of limestone and 340 tons of bituminous sandstone. In the tables the amount and value are given for the material as it was first marketed, only 100 tons being included in the production.

1898 and 1899. E. W. Parker. Productive States: Cal. Colo. Ky, Tex., Utah, and Ind. Terr.
The first year that Indian Terr'y was reported was 1896. The following statements of production Okla.:

Incl. Ok.Tex.	1896	2,862	Short tons	Value	$35,220
" " "	1897	345			3,480

Incl. Ok. Tex.	1898	1,635	Short tons	Value	$ 7,952
" " "	1899	17,655			82,965

1899. E.W. Parker. The asphalt mines in Indian Territory not up to expectations. Only one near Dougherty is operating successfully.

The old "lithocarbon" properties near Uvalde reopened, yielded well in 1899.

OKLAHOMA ASPHALT.

L.C. Snider (1913) P. 16-18, discusses the opinions given by Richardson, 1908, "The Modern Asphalt Pavement" The opinion was that for various reasons the Okla. rock asphalt was not as desirable as the pavement imported from Europe. He compares sheet asphalt and rock asphalt. See p. 17:

"The percentage of bitumen carried by the Okla. rock asphalt is not usually as great as that of the finished sheet asphalt pavement. However, the physical characteristics of the rock asphalts and the artificial mixture used for sheet asphalts are so different that it seems that comparisons should be made, not with the artificial mixtures, but with other rock asphalts which are known to have given good service in pavements.-- The situation in Oklahoma, then, is similar to that in Europe in that we have rock asphalts of varying bitumen content, some of which may be used alone while others are mixed to produce a pavement of the proper bitumen content. As to the bitumen it is usually softer and more viscous than the Trinidad or Bermudez and shows a greater penetration than do those asphalts. The Trinidad and Bermudez asphalts are fluxed with residuum so that the penetration of the bitumen from the finished pavement is not very different from that from the hard pitch Okla. rock asphalt."

On p. 18 Snider's 2 tables bring out comparative sampling, thus:

Snider 2

Analyses of Sheet Asphalt Pavement.
taken from one street & its crossings, 4 blocks

		Total bitumen	Asphaltene	Petrolene.
I	Muskogee	13.5	9.9	90.1
II	"	11.0	38.2	61.8
III	"	11.5	17.8	82.2
IV	"	10.5	24.6	75.4
V	"	12.0	29.8	70.2
VI	"	11.0	21.9	78.1
VII	"	9.1	32.9	67.1
VIII	"	11.5	24.8	75.2
IX	"	10.2	21.6	78.4
X	"	9.7	28.5	71.5

Analyses of Rock Asphalt Pavement Samples Taken from the pavement in various cities from several quarries.

	Total bitumen	Asphaltene	Petrolene.
I Ardmore	8.53	22.40	77.60
II "	7.85	21.19	78.81
III "	8.05	21.90	78.10
Iv Ada	9.97	22.45	77.55
V Sulphur	10.10	27.35	72.65
VI "	9.80	29.39	70.61
VII Okla. City	9.95	25.21	74.79

Snider 3 39

"It appears that although the % of bitumen in the Oklahoma rock asphalt pavements is less than that in the sheet asphalt pavements, it is as great as that of the rock asphalt pavements of Europe which have given satisfaction for years."

40

J.O. Beach, Mineral Production of Oklahoma, O.G.S. Mineral Report No 13, May 1942, p. 6-7.

Production in Oklahoma
ASPHALT

Year	Rock Asphalt.		Grahamite.	
	Tons	Value	Tons	Value
1903	4,230	$12,780	877	$15,442
1904	5,457	12,516	1,000	25,000
1905	1,300	3,250	1,635	24,540
1906	738	2,029	1,952	16,432
1907	4,002	11,627	966	7,743
1908	None reported		2,286	20,340
1909	6,423	12,846	3,894	32,737
1910	11,959	65,244	None reported.	

1911	19,747	80,056	5,000	15,000
1912	15,766	85,643	None reported from	
1913	16,459	91,416		
1914	9,669	73,535	1912 to 1921, (incl)	
1915	16,907	118,351		
1916	15,431	112,555		
1917	5,793	34,344		
1918	Included in other states			
1919	4,323	18,187		
1920	7,522	45,898		
1921	25,573	87,587		
1922	47,556	163,502	41	$533
1923	25,800	150,100		
1924	17,961	80,825		
1925	27,450	82,830		
1926	37,010	121,830		

Beach 2 41

Total	327,076	$1,466,879	17,651	$157,767

Averages for years included above are as follows:

14,867	$66,676	1,961	$17,530

After 1926 included in other states.

Maltha reported as follows:			
1907	25 tons	$	500
1908	116 "		3,480
1909	102 "		2,547

42

OKLAHOMA ASPHALT

Statistics of Production, from U.S.G.S. Minl Res. and U.S. Bur. Mines Minerals Yearbooks. (Short Tons)

Year	Gross Prod	Manufact-ured.	Native Rock Net	Value	Remarks
1903			5,107	$28,150	Indian Territory
1904			6,457	37,516	" "
1905			2,936	27,790	" "
1906			2,690	18,461	" "
1907			5,038	20,770	Okla. Nov 1907
1908			2,402	23,820	a State,
1909			10419	48,130	Incl. W.Va.
1910			11,959	65,244	
1911	82,387	52,650	29,737	105,031	Incl. Ill & Ky
1912	65,717	53,545	12,172	57,549	" " "

1913		16,459	91,416	
1914		9,669	73,535	
1915		16,907	118,351	Colo Ky Okla Tex
1916	Colo Tex Okla Ky	15,431	112,555	C" " " "
1917	" " " "	5,793	34,344	" " " "
1918		(25,703	105,034)	Ky Okla & Tex.
1919		4,323	18,187	Bit. & Grahamite
1920		7,522	45,898	
1921		25,573	87,587	Bit Rock & Grahamite
1922		47,597	164,035	" " "
1923		25,800	150,100	
1924		17,961	80,825	
1925		42,460	132,380	Cal. & Okla.
1926		37,010	121,830	Cal. & Okla.
1927		42,460	132,380	" " (??)

1928	110,360	406,575	Ala. & Okla.
1929	77,209	258,886	Ala Okla Cal.
1930	79,980	297,211	" " "
1931	80,333	341,682	Ala Cal N.M. Ok U
1932	Grouped		Ala Cal Kan N.M. Okla.
1933	"		" " " " "
1934	290,940	1,152,331	Inc. Tex Okla.
1935	185,013	726,801	Inc. N.M. "
1936	333,243	1,245,442	" " "
1937	265,895	1,075,832	Tex. Okla. & N.M.
1938	206,443	727,032	" " "
1939	221,497	684,808	" " "
1940	282,250	833,248	" "

ASPHALT
DO NOT DESTROY
This file

File compiled by H. B. Goodrich in 1943-1944 for U.S.G.S. Numbers on locality file cards placed on U.S.G.S. Okla. base map, 1:500,000.

A few localities added by L. Jordan in Aug. 1963. - May 1964 These are written poorly in ~~long~~ hand. All typed material is by Goodrich.

OKLAHOMA GEOLOGICAL SURVEY
NORMAN, OKLAHOMA

L.J.
8/1963

See also "Compilation of field sheet data

Occurrences of Asphalt etc in Oklahoma.

ASPHALT, SHALLOW OIL
to 500 feet
H.P. Goodrich card file

Information on localities of asphalt etc. occurrences are given for the following counties:

Atoka
Bryan
Caddo
Cherokee
Coal
Comanche
Cotton
Craig
Garvin
Grady
Greer
Hughes
Jefferson
Johnston
Kiowa
Latimer
Le Flore
Love
Marshall
Mayes
McCurtain
Murray
Muskogee
Nowata
Okmulgee
Osage
Ottawa
Pittsburg
Pontotoc
Pushmataha
Rogers
Sequoyah
Stephens
Tulsa
Washington

Atoka County

T.A. Hendricks. Black Knob Ridge-½ Atoka County. U.S.G.S. Oil & Gas Investigations Preliminary Map 1. 1943.

See cards covering quarry and old asphalt mine in T1S, R12E., and abandoned mine in T2S, R13 E.

The Geologic map covers area of 1 & 2 S. Rs. 11,12, 13 E. Two asphalt occurrences and 1 chert quarry partly oil saturated are shown. Following is condensation of a part of the Geology description.

Petroleum possbilities. Within the Ouachita Mountains many oil seeps occurs in steeply dipping sands of the Stanley shale. The most extensive seeps are in the Heddin field where light oil has been bailed. from wells 600' This is about a mile E. of the N.E. corner of this map. Veins and

irregular deposits of grahamite occur in steeply dipping beds and are believed to have been derived from petroleum. (See Stringtown quarry other card")

The author defines the Arbuckle facies as source of petroleum. Strata south of and above the Choctaw fault are badly faulted and no structural traps. Below the Choctaw a possbility of less faulting and seeps of oil that may have migrated upward from the Arbuckle facies that contain oil and therefore petroleum may be present.

Atoka County

C.W. Honess. Oklahoma Geological Survey, Bull. 40, 1930, P. 97-98. Discussing counties. Atoka, Pushmataha, McCurtain, Bryan, Choctaw.

The occurrence of asphalt at Sardis (Pushmataha County) he ascribes to a "first" class, i.e. nearly vertical vein in Stanley formation, and it is one mile long. The second class, i.e. impregnations of S. S., are in the McGee Creek valley, near Redden, Atoka County. These are saturated with asphalt and can be followed 100 yards or more. At depths of 600' or more the S.S. contains fluid oil. The exposed strata are Stanley and probably represent the original oil sands.

There ledges of SS. 4-6' thick, dipping steeply, outcrop.

P. 101. Discussion of origin of asphalts. The Caney shale is marine, and is a likely source. With

this Honess considers Wapanucka Ls. and other beds of the Arbuckle series which are in part petroliferous. In this connection the Choctaw thrust fault opens the way for escape to surface.

Sec. 23, T1N., R14E.

(1) Name of Property. Williams Mine

Location. County Atoka. N.E. Cor. S.W. NW S.W. Sec. 23, T1N., R14E. McGee Valley on W. side.

Information Source. 1, p. 223. 12, p. 251. 5, p. 293-294

Material Described. Asphaltite a mineral resembling albertite.

General Geology. First observed in 1897; a vein fissure filling of fault planes which strike N.E.-S.W.

Commercial Development. A prospect only. See also Choctaw Asphalt Co. in the Impson Valley, Pushmataha Co.

Miscellaneous. Abraham (1938, above reference) says 2 small veins, of 4" and 1' thickness constitute the Williams Mine. Shafts from 15 to 20' but not sufficient g grahamite for development. Abraham gives following test:

Fixed carbon	43.50-45.7%
Sol. in CS2	95.7-99.7%
Non-Min. Matter insoluble.	0.0-4.0%
Free mineral matter	0.3%
Sol. in 88 Deg. Pet. naphtha	4.5-6.8%

Refers to larger deposit in T1S, Rs 13-14E.

23-1N-14E

Williams Mine 2

Taff (1909) has the above and: "These veins are vertical and cut folded and crumpled green shales of the Standley. The strike of the veins is almost N-S, but the trend of the rocks is E-W. The grahamite is friable and lustrous. The deposits have not (in 1909) been prospected sufficiently to prove their volume, but are of possible economic importance."

See Sec. 30, T1S, R14E. and in Pushmataha Co. 1S-15E.

Sec. 28, T1N. R14E.

(2)

Name of Property.

Location. County, Atoka. S.E. Sec. 28, T1N., R14E. On McGee Creek.

Information Source. 6, p. 85.

Material Described. Grahamite; one of the two occurrences in McGee Valley. See Pumroy Mine.

General Geology. A vein, 1"-2" thick in distorted, mashed faulted green shale (Standley). The general strike of formation is N 30 E. The grahamite occurs in veins in faults.

Commercial Development. A shaft was originally sunk on the grahamite to 15-20 feet, but work was abandoned because the vein did not increase.

Miscellaneous.

Sec. 15, T1S., R12E.

(3)

Name of Occurrence. Chickasaw Creek. Deposit. $2\frac{1}{2}$ Mi. E. of Stringtown on M.K.&T.R.R.

Location. Atoka County, $2\frac{1}{2}$ Mi. E. of Stringtown Sec. 15, T1S., R12E.

Information Source. Abraham 12, p. 252.

Material Described. Report of an undeveloped vein about 9' thick in shale carrying streaks of grahamite.

General Geology. Hendricks (1943) shows practically all of Sec. 15 is Standley shale. No other notes (U.S.G.S might advise as to above occurrence tentatively spotted on map.)

Commercial Development. Undeveloped.

Miscellaneous. Abraham (1938, above reference) simply cites the report without comment and gives no definite location in the Section.

Sec. 16, T1S., R12E. Name of Deposit. Stringtown Quarry.

(4)

Location. Atoka County. $S\frac{1}{2}$ $N\frac{1}{2}$ Sec. 16, T1S, R12E.

Information Source. Thomas A. Hendricks. Black Knob Ridge Atoka Co. Preliminary Map 1, US.G.S.

Material described. Oil saturated rock of the quarry.

General Geology. The country rock is Ordovician Bigfork chert. "In the chert quarry at Stringtown, the beds south of a reversed fault exposed on the floor and south wall of the quarry are saturated with oil.

Shine of sec. 16, 1S-12E liquid seep (Viola-Sylvan contact)

DGS-AGS Ouachita Symp p 59

Correction by J.V.H. 9/1963

Atoka County. (5)

NE Sec. ~~19~~ 16, T1S, R12E. J. V. Howell is source of information. Without specification of the nature of the asphalt deposit it is assumed to be native rock, and as stated in the last column the producing rock is probably the "top of the Viola."

(Pending later, check the note on the map is made in pencil.)

Hendricks (1943) map shows this section all Atoka or Qal through $NE\frac{1}{4}$ 2 faults NE-SW no notes of asphalt.

Ouachita Symposium, DGS + AGS, 1959, p 59

NE/4 asphalt at top of Viola

JJ 9/63

Sec. 32, T1S., R12E. Name of Deposit. Boggy Creek

(6)

Location. County, Atoka. NE Cor $NW\frac{1}{4}$ Sec. 32, T1S, R12E. On S. bank North Boggy, 4 mi. NE of Atoka.

Information Source. 5, 296, 6, 86. 12, p. 252. Hendricks 1943.

Material Described. Vein of grahamite filling along the bedding planes and joints and seams of the enclosing green shale.

General Geology. In green shale with chert, in Talihina of Ordovician. The vein about 80 feet, the vein is 2" thick at the opening and thickening below. Local faulting

Commercial Development. The mine worked on slope of 32 degree S80E. The material resembles the Jumbo grahamite and upper portion of Tuskahoma deposit.

Miscellaneous. Taff (1909) says that at time of visit the occurrence could not be fully observed, but a quantity of grahamite ready for shipment. The physical property of this bitumen are essentially the same as those of the Impson Valley grahamite. The material is black, has a bright luster, is brittle, and presents an irregular fracture. It takes fire and swells in a candle flame and continues to burn with a short flame after the candle is

Boggy Creek 2

is removed."

Further source of information is Thomas A. Hendrick, 1943, "Black Knob Ridge, Atoka County", Oil & Gas Investigations Map No. 1, U.S.G.S. From this the Loc. is NE NE NW Sec. 32, T1S R12E., about $\frac{1}{4}$ mile W. of North Boggy Creek. Outcrop is near a fault, in Silurian Missouri Mountain shale contact with Ordovician Polk Creek Sh. dipping steeply to SE.

See the authors Geology of the Black Knob Ridge.

Atoka

32-1S-12E
NENW

Old Asphalt pit - measured section
See Hendricks, Knechtel + Bridge, 1937,
Geology of Black Knob Ridge
AAPG vol. 21, p. 25

Sec. 8, T1S, R13E.

(7)

Name of Property.

Location. County, Atoka. S.W.¼ Sec. 8, T1S, R13E.

Information Source. 6, p. 75.

Material Described. Sand Asphalt was reported to Hutchison, (6, p. 75) but was not examined.

General Geology.

Commercial Development. No development; Hutchison states " "no idea of their value and extent can be given."

Sec. 25, T1S, R13E.

(8) (9) (10)

Name of Property. The Pumroy Mine or Moulton Mine.

Location. County, Atoka, NE¼ Sec. 25, T1S, R13E. McGee Valley. 12 miles SE Stringtown.

Information Source. 6, p. 85-86. 12, p. 251-252.

Material Described. Vein of Grahamite.

General Geology. "--the grahamite is contained in a fissure caused by the faulting of the formations, at an angle to their outcrop, after they had been steeply upturned." (6, p. 85)

Commercial Development. The mine has 3 openings on the vein, date unknown, but probably back in the 70's, on branch of McGee Creek. Carloads shipped from Stringtown. Shaft No. 1 flooded, abandoned. The second shaft ¼mi. S.W. of No. 1. Probably total of more than 100 cars from Stringtown.

Miscellaneous. See also NW¼ Sec. 30, T1S., R14E. for the same Mine. Abraham (1934), reference as above) describes "The grahamite fills a fissure caused by faulting and is reported to be 14 to 15' thick at the surface tapering to about 4' at a depth of 110'. The mine is now abandoned, but when operated some years ago, about 2,000 tons were mined annually, being hauled 15 mile to Stringtown. A prospect occurs about $\frac{1}{4}$ miles S. of the above, consisting of a vein about 2' thick. This tested as follows:

Fusing point (K&S method)	473 F
Fixed carbon	38,42-41.0%
Sol. in CS2	83.7-95.0%
Non-Min. Matter insol.	4.8-9.2%
Free Mineral matter	0.98-7.1%

NW$\frac{1}{4}$ Sec. 30, T1S,R14E. shown on opposite side, forms parts of the Pumfret or Moulton Mine.

See another card covering Locs. 9 & 10 on Sec. 30. No 10. Hendricks 1943 Maps no Asphalt Rocks in Sec. 3-15-14E are Johns Valley to Lower Jackfork.

Sec. 13, T1S,R14E.

(11)

Name of Property. Reported by 6, p. 75 to be on land of E.P. Miller, of Reddin.

Location. County, Atoka. N.E. Sec. 13, T1S,R14E. 15 Mi. W. of Frisco R.R.

Information Source. 6 P. 75, 11 P. 13. 12 P. 163.

Material Described. Sand Asphalt a massive sandstone bed containing 6% to 8% asphaltic bitumen.

General Geology. Country rocks are Pennsylvanian; Standley or Jackfork. Greatly distrubed. Sandstone is fine grained.

Commercial Development. No development. Thickness of the S.S. ledge not determined.

Miscellaneous.

Sec. 30c, T1S., R14E   Name of Occurrence. McGee Creek.

(9) Dup
(10) "

Location. Atoka County.
(1) NW corner Sec. 30, T1S R14E.
(2) SW corner NW-30, 1S, 14E.

Information Source. Taff (1909) 5, 293-294.

Material Described. Grahamite.

General Geology. The deposits are in Standley shale crumpled and folded. At locality (2) the dip is E. but further S. the strata are E-W and dip very steep to S.

A zone of faulting in which the rocks to the S. are thrust upon those at the N. This has been traced eastward from McGee Creek for many miles.

Commercial Development. These two locations made late in 1905 or in 1906. At Loc. (1) a shaft sunk to 75'. The vein concealed at time of Taff's visit, said to have been 4' thick in the shaft. From the mine several carloads of grahamite taken. At Loc. (2) the vein is 2'6" thick filling a fissure that extends N-S. and dips 66 Deg E. approximately with the bedding of the rocks.

Sec. 31, T1S, R14E.   Name of Deposit.

(13)   Location, County, Atoka. N.E. 1/4 31, T1S, R14E.

Information Source. 11, Atoka Co.

Material Described. Sand and Gilsonite at S.W. edge of Jumbo.

General Geology. Formations dip 85 E., strike N-S. Gilsonite occurs in thin veins in sandstone and shale.

Commerical Development. About 1914 some work was done

on a bed of gilsonite at the S.W. edge of Jumbo. Abandoned about 1917. Prospect pits for 2 miles.

Miscellaneous.

Atoka County

J.V. Howell is source of information of the following: SW Sec. 12, T2S, R11E., $\frac{1}{2}$ mile E. of Atoka. (the note does not specify the nature but) it is assumed to be native rock asphalt deposit for the formation is said to be "Stringtown & Viola".

(Pending later check the note is placed on the map in pencil)

(14)

Omitted
LG
9/63

Sec. 13, T2S, R13E. Name of Property.

(15) Location. County, Atoka. S$\frac{1}{2}$ ~~Cor~~. Sec. 13, T2S., R13E. SE1/4 by Ham

Information Source. 6, p. 75.

Material Described. Sand Asphalt with small vein of Impsonite of grahamite.

General Geology.

Commercial Development. A prospect pit was opened in early days, but no great development. Extent of the occurrence obscured and not determined by Hutchison. (6, p. 75)

Miscellaneous. Further source of information is "Black Knob Ridge, Atoka County, by Thomas A. Hendrick. USGS preliminary Map No. 1, of Oil & Gas Investigations, (undated). Abandoned grahamite mine Loc. SW Cor. SE Sec. 13,T2S R13E. Directly upon a N-S fault with Atoka Fm. at the W. and Jackfork SS and Sh. to the East. Strike N20E., dip to NE.

See Geologic description other card.

Sec. 26, T2S, R13E. Name of Property.

(16) Location. County, Atoka. N$\frac{1}{2}$ Sec. 26, T2S, R13E. Between McGee and Boggy Creek.

Information Source. 6, p. 75. 11, p 13.

Material Described. Sand Asphalt.

General Geology. In Pennsylvania Formation rocks.

Commercial Development. Never prospected. Hutchison (6, p. 75) states "is of little consequence."

Miscellaneous.

Sec. 35, T2S, R13E. Name of Property.

(17) Location. County, Atoka. Cen. Sec. 35, T2S, R13E. 18 Mi. S.E. of Atoka.

Information Source. 6, p. 75; 11, p. 13; 12, p. 163.

Material Described. Shale asphalt with a little petroleum.

General Geology. "The asphaltic shale is underlaid by a massive sandstone which exudes a small amount of bituminous matter (6, p. 75).

Commercial Development. Prospected only by pits (2 or more) 10-15 feet deep. Small deposit.

Miscellaneous.

Atoka County

NE NW Sec. 3, T2S, R14E. J.V. Howell is source of information for the following:

Reported briefly without comment: "Grahamite in Stanley".

(Pending further check the note is placed on the map in pencil).

(18)

Atoka County, Oklahoma

Shelley (1929), 18, p. 25, Table of tests, reference: "About Sec. 24, T3S, R11E. Sample 78, in Trinity S.S. Bitumen 5.73%."

(19)

Secs. 24, T4S, R9E; and 19, T4S, R10E.

(20)

Name of Property.

Location. County, Atoka. In Secs. 24, T4S, R9E; and 19, T4S, R10E. The Loc, is uncertain but more definitely 5 mi. N.W. of Caddo.

Information Source. 6, p. 75/

Material Described. Reported sand asphalt and maltha but value not known.

General Geology. Said to be in Trinity sand of Cretaceous.

Commercial Development. This occurrence probably undeveloped. Report only.

Miscellaneous. See Shelley (1929) Sample 76 probably established Loc. as "SE$\frac{1}{4}$ Sec. 24, T4S-R9E. Trinity 6.82% Bitumen".

Sec. 24, T4S, R9E.

(20) Dup.

Name of Occurrence.
Sample No. 76 of 18, p. 25

Location. Atoka County.
SE$\frac{1}{4}$ Sec. 24, T4S, R9E.

Information Source. 18, p. 25 Table test Sample 76.

Material Described. Soft material.

General Geology. In Trinity S.S.

Commercial Development.

Miscellaneous. Shelley (1929) 18, p. 25. Table of tests sample No. 76 shows In the Trinity with bitumen 6.82%. This is thought to be Maytubby Spring. See 18, P. 12.

$N\frac{1}{2}N\frac{1}{2}$ Sec 26 - 1N - 14E
West Daisy
"" Atoka Co.

Penn sd @ 390'-438' 30' thick
disc. Jan. 1953 4 wells

Vaugh # 1 School land
Pumped 10 BOPD TT 481

On map

Atoka Co. 31 - 4S - 12E
SE 1/4

on Cooper Creek. - asphaltic sd outcrop -
From C.C Branson. 1965? thesis

26 - 1N - 14E
Vaughan #1 School land Atoka Co CNENW
TD902. P. 3 BOPD ~~Atoka~~

26 - 1N - 14E
N/2 S/2 N/2 NW
Vaughan #2 School land
TD487 PS BOPD, gravity 43° from
Staley.

On map

Chenoweth, OGN. vol. 19 p. 207

30-1S-14E
NW NW NW
Atoka Co

Brunson #1 Long

asphaltic sand recorded at 760'
in Stanley 1960 Omitted

SW ext. of Redden field +
in proximity to exposures of
asphalt rock

35-2S-13E
NW NESE

Huddle
#1 Synder

Atoka Co

Atoka Co.
On map.

TD 504 P 4 1/4 BOPD from 480-487
25° gravity (p. 201) Stanley

35-2S-13E
SE
Malernee 1 DOK Ranch ±15 BOPD, Stanley, 452'
9/63 Chenoweth OGN vol 19 p. 203
207

26-1N-14E
SWNWSE
Atoka Co.

Max Pray #1 Wynick
asphaltic staining @ 100' in
vf + loose dk gray poorly sorted
sand - Stanley.
Omitted

Daisey, West pool.
one-well pool disc in 1953
prod. 164 BO to Oct 1962

NW 1/4 4-1N-15E

2a

Ch Grahamite in Stanley Shale, reported as 7-foot vein encountered at depth of 50 feet

Analysis p.5 OGS M.R. 30

LJ
9/63

5-1N-15E
NESW
Bald port.
Atoka Co

Depth 185', 42° gravity 1-2 BOPD
Stanley ss.

On map

Chenoweth, OGN, vol 19, p.201, p.205

25-1N-15E
Atoka

Shallow oil well in Stanley ss

1959 DGS-AGS Ouachita Symposium
p. 59

LJ
9/1963

NE 1/4 Sec.13 T.1S. R.14E
Asphalt in Stanley SS

19-1S-11E
SWNENW
Atoka Co

Prairie Inv. Co 1 Cobb
Spotted asphaltic staining
noted in brown chert and dolomite
at 60' and 40'

Omitted

24-1S-13E
Atoka Co
SESESE

Renehart 1 Minnick
Free oil pumped from Stanley of
Jackfork 790-834 sdy lime to
limey sd. 38° gr. 1958
IP 2 BOPD

Omitted

9-1S-14E
Atoka
CSWN/2 NE
Redden prof.
Croxton 1 Miller TD 556
P 3 BOPD from Stanley 88-95' on map.
CS1/2 N1/2 NE

#2 Miller TD192
P 3 BOPD, gravity 39, Stanley at 165'
6 oil wells in
NE1/4

Chenoweth, OGN vol. 19 p 204-205

19-1S-14E
SESWSW
= Atoka
Fletcher #1 Cole TD243 plugged unmap
Swbd 2 BOPD first 24 hours
prob. in Atoka

19-1S-14E
SWSWSW
TD375(p. 205)
Oil 100-300-Atoka

Chenoweth, OGN, vol. 19, p. 207

The O.G.S. office in Norman could give no information on any occurrences.

Name of Deposit.

Location. Bryan County.

Information Source. 6, p. 77. 7. p. 15.

Material Described. Good sandsasphalt from unknown localities were submitted to the Oklahoma Geological Survey.

General Geology.

Commercial Development. None.

Miscellaneous. Hutchison, in O.G.S. Bull. 2, 1911, merely mentions the county and vaguely suggests its possibilities for large deposits of high grade rock are good.

Snider (1913) says Bryan county contains some deposits of sand asphalt N.E. of Durant.

Bryan Co.

33-5S-12E

10' W of bridge over Clear Boggy
on South bank.

CC Brown 1965 fm? thesis

NW NW SE
16-8S-8E
Bryan Co

Atkablue #1 Brown
Spotted brn-staining
recorded in many sds of
Cret and Stanley 1934 dry hole
@ 6676

Omitted

Bryan ? .

C Hiles Dome
Bryan Co.

Prod. @ 435 in McAlester

1957?

No such field in
Mid Continent
Oil + gas files.

Semits Yearbook

Sec. 29, T5N, R12W. Name of Deposit.

(2) Location. Caddo County. S.E.¼ Sec. 29, T5N, R12W. About 7 Mi. WxS of Apache.

Information Source. 6, p. 30. Hutchison states is reported by Geologist Pierce Larkin. 12, p. 160.

Material Described. A deposit of rock Asphalt.

General Geology. In the Permian Red Beds.

Commercial Development. Apparently undeveloped. Extent

of the deposit unknown.

Miscellaneous. Hutchison (6, p. 30) terms this Location number five. Other authorities are, 11, p. 6 and 12, p. 160. Woodruff, Abraham and possibly Hutchison carry under Comanche County but T5N R12W is in Caddo. Verify location.

Caddo Co.
35-5N-12W
Caddo
SW NW SW

Reynolds & Lasater
Randlett-
#2 Myers
1963

1 BOPD from perf. 10-28'
TD 447
Named SE Boone field

Sec. 7, T5N, R12W. Name of Occurrence.

(1) Location. Caddo County. About 8 Mi. WXN of Apache. NE.NE.¼ Sec. 7, T5N, R12W.

Information Source. 16, p. 83.

Material Described. Oil reported (only) in water dug well at 70'.

General Geology.

Commercial Development.

CHEROKEE COUNTY

James H. Gardner. Personal communication, Mar. 1, 1944.
From Whitmire Spring ¼ mile SE. In NW. Cor. SW. of Sec. 1, T18N, R23E. Cherokee County, a spring and seep of brown waxy oil from a bed of the Sylamore S.S. 2'-3' thick.

In this connection see personal comment of Dr. Edward Bloesch that he has examined samples of oily sand from the Sylamore at some point within the outcrops in two areas respectively in T's 17 & 18, Rs 22-23E. and T 17 N, R 23-24E. as shown in the Tahlequah Folio. J.A. Taff, the author of this Folio describes the Devonian System, a single formation of black shale with rather pure siliceous SS or locally bituminous phosphatic conglomerate at the base.

"The Chattanooga Fm. consits of a black bituminous shale with a local or lenticular deposit of conglomerate or so-called sylamore sandstone." The Sylamore is found at 4 localities, one on the N. side of the Illinois near the N. border of the Tahlequah sheet; and the other three are on the W. side of Sallisaw Creek Valley NW and N of Marble.

The above is quoted to show that the Chattanooga shale which underlies most of this part of Oklahoma is regognizable bituminous possibly the source of the shallow gas and surface oil noted.

Location: Cherokee Co.
About C 13, T.19N. R.23E.

Sylamore SS resting upon Simpson in creek bed - at bridge on Route 10.

Info. source: Eastern Oklahoma Field Trip Nov. 2, 1957. AAPG Mid-Content meeting p. 9. Stop at 42.0 miles

"Outcrop is oil-saturated with black asphaltic residue

LJ. 1963

Coal Co., Okla
29-1N-8E
C SW NE NW

JelkoDrly Co 1 Garrety
9/1963

Perf. 536-546 Bailed tny blk asphatic oil, est. 7-8°, TD 1196

Omitted

R.O.R.

Sec. 1 & 2, T1N,14W

(190)

Name of Occurrence.

Location. 3 Miles S. of Cache. Comanche County. (1) NW.NW.¼ Sec. 1; and (2) SW.SW.SW. T1N, 14W.

Information Source. 16, p. 83.

Material Described. (1) A dug well said to have shown oil at 10'. (2) A spring opened said to have smelled of oil.

General Geology.

Omitted from list 1963

Commercial Development.

Miscellaneous. Wegemann, p. 83, gave these as unverified (and therefore not to be fully accepted) reports.

T. 2 N. - R. 11 W.

Comanche County

From the unpublished notes of the Oklahoma Geological Survey, furnished for the present compiler's personal inspection.

Field Sheet 40-11 samples.

SE NW Sec. 16, T2N,R11W. 15 Acres onwed by U.S.Government of which 10 acres are good. Estimated: 200,000 tons.

Lab.Tests.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
40-1	12.2.%	High	70% Ls. 30% Sd.	Calcite Qtz.Oil Asphalt	Floor sweep bas Road topping.
40-2	13.13%	High	67% Ls. Iron Mn 1%	Oil, Asph. Calcite Hematite	Floor sweep base Road topping.
40-3	2.50%	Low	QtzSd 98% Ls. 2%	Qtz.Calcite.	Tool low in Bitumen.
40-4	14.60%	Low	Qtz Sd95% Ls. 5%	Qtz.Calcite, Asph Oil	Road topping. Paints.
40-5	44.10%	VeryLow	Qtz Sd.	Qtz.Asph.	Road topping. Paints. Roofing.
40-6	8.75%	Low	Qtz. Sd.	Qtz. Asph.	Road topping.
40-7	6.94%	VeryLow	Ls.Qtz.	Asph. Qtz Calcite	Road topping.
40-8	2.2%	VeryLow	Ls.Qtz.	Asph. Qtz. Calcite	Road topping.
40-9	16.13%	Low	Ls. Qtz.	Asph.Calcite, Qtz.	Road topping.
40-10	12.9%	Low	Ls. Qtz	Asph. Calcite, Qtz.	Road topping.
40-11	42.20%	VeryLow	Qtz Sd.	Asph. Qtz	Road topping. Roofing.

(15)

Sec. 21, T2N, R11W.

(16)

Name of Occurrence. Lawton-Wichita Mountain District.

Location. SW.NE¼ Sec. 21, T2N, R 11W. Comanche County.

Information Source. 16, p. 81.

Material Described. Fine shaly S.S. impregnated with oil for 150.

General Geology. Oil bearing shaly S.S. beds 6" thick alternating with barren shale. Asphalt oozes at one point. Some small unimportant faults. Migration oil th

through joint planes.

Commercial Development.

Miscellaneous. See card of Lab Test. O.G.S. furnished 2/8/44.

Comanche County. (16) Dup

From the unpublished notes of the O.G.S. which will probably be published later. Copies furnished to the present compiler for his personal inspection.

See other card covering in Lawton-Wichita Mts. Dist.

Field Sheet 295 - 3 samples

NE Sed.21, T2N,R11W.

Sample	Bitumen	Penetration.	Residue	Minerals	Use.
295-1	7.0%	High	Qtz. Sd.	Oil,asph Qtz.	Road topping if blended.
295-2	2.27%	High	Qtz,Sd.	Oil,asph. Qtz.	Road topping. Floor sweep.
295-3	5.5%	High	Qtz. Sd.	Oil,Qtz. Sd.Asph.	Road topping. Floor sweep.

See card covering Sec. 21 in Lawton-Wichita Mt.

Sec. 24, T2N,R11W.

Dup. (18)

(17)

Name of Occurrence. Hutchison 6, p. 30) lists as Loc. #2.

Location. SW. corner NE Sec. 24, T2N,R11W. 5Mi. NE Lawton. Comanche County.

Information Source. 6, p. 30; 11, p. 5; 12, p. 160. 16, p. 81; 18, p. 25, Table of tests Sample 26.

Material Described. 1-an outcrop S.S. asphaltic, and 2-an oil spring.

General Geology. The structure is monoclinal. Dip S20E

---

at low angle. False bedded Permian S.S. At (2) the oil comes from below the asphalt bed.

Commercial Development. The rock asphalt has been quarried and is near SW. corner of the ¼ Sec. The oil spring near the N. line of the ¼. No systematic development and value not known.

Miscellaneous. Table of tests 18, p. 25, Sample No. 26, shows Bitumen 7.69%. See card covering unpublished O.G.S. Lab tests.

Sec. 24, T2N, R11W.

(17) (18)

Name of Occurrence. Lawton District.

(1) Comanche County

Location. SW.NE¼ Sec. 24, T2N, R11W. (2) NE.NE. Sec. 24-2-11.

Information Source. 16, p. 81.

Material Described. (1) Asphalt impregnating a bed of S.S which is found at various knolls. (2) Just S. of reservation an oil spring.

General Geology. (1) Rock is medium grained S.S. Impregnation is thorough.

(2) The oil comes from some source below the S.S. bed.

155

Commercial Development. ~~Deposit of (1) has been quarried~~

Miscellaneous. See card covering unpublished O.G.S. lab Tests.

Comanche County (17) Dup.

From the unpublished notes of the Oklahoma Geological Survey, which will probably be published later. Copies furnished to the present compiler for his personal inspection.

Field Sheet 294- 3 samples. 1808 Cu yds. Thickness 3½-4' SW NE Sec. 24, T2N,R11W.

Sample	Bitumen	Penetration.	Residue	Minerals	Use.
294-2	8.23%	High	Qtz.Sd.90% Ls. 10%	Asphalt Qtz. Ls.	Road topping1 Floor sweep base
294-3	5.5%	High	Qtz. Sd.	Oil,Qtz. Sd.Asph.	Road topping. Floor sweep bas

See two cards this ¼ Section.

Sec. 17, T2N, R12W.

(12)

Name of Occurrence. Lawton District, S. of Fort Still Reservation.

Location. Comanche County. SE. SE¼ Sec. 17, T2N,R12W.

Information Source. 16, p. 82.

Material Described. Sandy layers in limestone which are impregnated with asphalt.

General Geology.

Commercial Development.

Miscellaneous.

Sec. 21, T2N,R12W.

(13)

Name of Occurrence. Hutchison
6, p. 30 lists as Loc. #3.

Location. Comanche County. Gen.
$W\frac{1}{2}$ NW 21, T2N,R12W. 6 Mi. NW of
Lawton.

Information Source. 6, p. 30; 11, p. 5; 12, p. 160;
16, p. 82.

Material Described. Sand Asphalt. Low asphalt content.

General Geology. The deposit is along a zone of local faulting. The S.S. is fine grained, cross bedded, irregularly impregnated.

Commercial Development. Considerably exploited but asphaltic content unprofitable except possibly as adulterant for richer rock. Prospecting has been done by open pits 4' deep.

Miscellaneous.

Sec. 34, T2N, R12W

(14)

Name of Occurrence.

Location. Comanche County.
NW $NE\frac{1}{4}$ Sec. 34, T2N,R12W.

Information Source. Frank Gouin, O.G.S. Bull. 40 DD, 1928, refers thereinto 16, P. 82.

Material Described. Asphalt-bearing sandstones.

General Geology.

Commercial Development.

Miscellaneous. See card referring to unpublished notes of U.G.S. 2/8/44.

From the unpublished notes of the Oklahoma Geological Survey; probably later to be published; furnished to the present compiler for his personal inspection.
See card referring to O.G.S. Bull. 40 DD. 1928.

NE Sec. 24, T2N, R12W. Field Sheet 293-2 samples. The deposit has been mined. Thickness 5'-8', 10,793 cu. yds.

Sample 1: Bitumen 5.39%
Penetration Medium
Min. Res. Qtz. Sd.
Minerals Oil Asphalt, Qtz.
Good material for road topping.

Sample 2: Practically no bitumen; no commercial value.

Sec. 15, T2N, R13W. (9)

Name of Occurrence.

Location. Comanche County. About 5 mi. E. of Cache. SW.SW.SE¼ Sec. 15, T2N, R13W.

Information Source. 16, p. 83.

Material Described. Massive S.S. partly impregnated with asphalt.

General Geology. The occurrence is on the W. bank of a stream which flows S.E.

Commercial Development.

Miscellaneous.

Sec. 22, T2N, R13W. (10)

Name of Occurrence.

Location. Comanche County. About 4½ Mi. E. of Cache. SW.SW. SE¼ Sec. 22, T2N, R13W.

Information Source. 16, p. 83.

Material Described. Massive S.S. bears asphalt.

General Geology. The massive S.S. is same bed as in Sec. 15. It is on the same stream and outcrops in one small exposure on the N.W. bank.

Commercial Development.

Miscellaneous.

Sec. 36, T2N, R1~~3~~4W. Name of Occurrence.

(11)

Location. Comanche County. SE¼ Sec. 36, T2N,R13W. Accd to 16, p. 83 this is SE¼ 36-2N-14W

Information Source. 16, p. 83. verified by Gouin, 1928.

Material Described. Per Gouin 1928, P. 222, "Asphalt noted in a sandstone that outcrops along a creek in the SE¼ Sec. 36."

LJ
1963

Sec. 9, T3N, R11W. Name of Occurrence. Lawton Oil Field District.

(8)

Location. Comanche County. SW.NE.¼ and SW. NW. SE¼ Sec. 9, T3N,R11W. In 3 small S. Draws.

Information Source. 16, p. 81-82 Verified by Gouin,1928

Material Described. 10 seepages of asphalt. The three are probably the same bed.

General Geology. The asphalt flows out of joints in red shale (Permian) about 3' below a conglomerate of shale and S.S. The most westerly seep holds about a pailful of black asphaltic oil.

Commercial Development.

Miscellaneous. See Lab tests of Oklahoma Geological Survey furnished to H.B.G. 2/8/44/
96 series.

Comanche County (8)

From the unpublished notes of the Oklahoma Geological Survey which will probably be published later. Copies furnished to the present compiler for his personal inspection.
Field Sheet 96- 14 samples. (See Wegemann (16) 1915).
NE of SW Sec. 9, T3N, R11W. 24' wide, 16' long.

Sameple	Bitumen	Penetration	Residue	Minerals	Use.
96-1	30.65%	Low	Ls. 75% Qtz Sd 25%		Road topping. Roofing paints.
96-3	26.8%	Very low	Qtz Sd.	Asph. Qtz	Road topping Paints and Roofing

96-4	21.3%	Very Low	Qtz Sd.	Asph. Qtz ica, Ls.	Road topping Paints&Roofi
96-5A	13.5%	Very Low	Qtz Sd 95% Ls. 5%	Asph.Silica, Ls.	Road topping
96-6	33.4%	Very Low	Qtz Sd	Asph. Qtz	Road topping. Paints & Roofing.
96-7	21.3%	High	Qtz Sd	Asph. Qtz	Road topping Floor Sweep base. Paints & Roofing.
96-8	13.4%	High	Qtz Sd 98% Ls 2%	Oil asph. Qtz. Ls.	Too soft for roofing if unmixed. Floor sweep base.

Comanche County (8) Cont'd.

96-9	13.4%	High	Qtz Sd, 98% Ls. 2%	Oil Asph. Qtz	Too soft etc.
96-10	14.8%	VeryLow	Qtz Sd.	Asphalt Silica	Road topping.
Rerun May 9, 1936 96-11A	5.83%	High	Qtz Sd 92% Ls. 8%	Oil, asph Qtz. Ls.	Road topping Floor sweep base
96-11B	10.27%	Very Low	Qtz.Sd.	Asphalt Qtz.	Road topping.
96-12	25.5%	Medium	Silica 60% Ls. 40%	Asph Qtz. Ls	Road Topping. Floor Sweep Paints, roofing
96-13	24.2%	Medium	Qtz. Sd.	Asphalt Qtz.	Road topping. Paints, roofing

96-14	24.1%	Medium	Qtz.Sd.	Asphalt Qtz.	Road topping. Paints, roofing.

Sec. 29, T3N., R12W.

(7)

Name of Occurrence. Fort Sill Military Reservation.

Location. Comanche County. NE$\frac{1}{4}$ Sec. 29, T3N, R12W. (if Res. were sectionized)

Information Source. 16, p. 83. verified by Gouin, 1928.

Material Described. Oil in cemented breccia along bed of a draw into Cache Creek.

General Geology. The breccia or conglomerate of granitic rock may represent basal Permian. The oil may be due to upward migration from E. source, or to downward from

Red Beds.

Commercial Development.

Miscellaneous. Wegemann (p. 83) says: "The rock, which is composed of fragments of altered rhyolite, yields on heating in test tube, a light yellow oil."

Comanche County

From the unpublished note of the Oklahoma Geological Survey which will probably be published later. Copies furnished to the present compiler for his personal inspection.

Field Sheet 244,1 sample (2 lab tests, May 1, and May 9, 1936)

SE SW Sec. 15, T4N, R11W. The asphalt deposit is 50' long and 20 ' wide running at 10 deg, angle into bank of Tony Creek Lab Test. Bitumen 1.96% The quantity of asphalt is unlimited

Penetration High;

Residue Qtz. sand. (2)

Mineral Oil, asphalt, Qtz.

Suitables for Road topping, Floor sweep base.

Sec. 26, T4~~S~~W, R11W. Name of Occurrence. Hutchison's Loc. No. 1 (6, p. 29)

(3)

Sample No. 23 of Shelley (1929)

Location. Sec. 26, T4S, R11W. 3 or 4 miles W. of Elgin. Comanche Count

Information Source. 6, p. 29; 12, p. 160; 11, p. 5, 16, p. 82; 18, Table of Tests, p. 25 Sample No.23.

Material Described. Sandstone saturated with asphaltic bitumen.

General Geology. Occurrence a little above the base of the Permian Red Beds. 18, P. 25 rates Permian. Exploration pit.

Commercial Development. ~~No~~ Exploration pit development of Asphalt was once worked by the Lawton Asphalt Company and considerable quantities used in paving streets of Lawton. The deposit is probably not exhausted.

Miscellaneous. Ref. 18, p. 25 Sample No. 23 in Permian Bitumen 7.80%.

(3) Dup.

Comanche County.

From the unpublished notes of the Okla. Geol. Survl furnished to the present compiler for his personal inspection.

Probably same location as Card A, Sec. 26, 4-11.
SW Sec. 26, T4N, R11W. O.G.S. Field Sheet 17, reports:
Area of asphalt 690' wide and 1350' long. On a creek bank.

Lab Test. Sample 17-9.
Asphalt 3.27%
Penetration low.
Asphaltic S.S. 91%, Limestone 9%
Minerals, Asphalt, oil, quartz, calcite.
Road topping material.

Comanche County

From the unpublished notes of the Oklahoma Geological Survey, which will probably be published later. Copies furnished to the present compiler for his personal inspection.

SE Sec. 27, T4N, R11W. Sample 207-1 Lab Test.
In SE corner of the Section outcrop of asphalt. No commercial importance.
Bitumen 4.27%
Penetration Medium
Residue Qtz. Sand.
Minerals; oil, asphalt, Qtz. sand

Use: Road Topping. (4)

Sec. 30, 4N, T11W.

(5)

Name of Occurrence. Lawton District N. of Fort Sill Reservation.

Location. S.E.S.W.$\frac{1}{4}$ Sec. 30, 4n, T 11W. Comanche County.

Information Source. 16, p. 82 Quoted by Gouin, 1928.

Material Described. A dug well reported heavy oil at 72' estimated at 4-5 Bbls.

General Geology.

Commercial Development.

Sec. 32, T4N.,R11W. **Name of Occurrence.** Lawton Oil Field District.

(6)

Location. Comanche County. SE. NE¼ Sec. 32, T4N,R11W.

Information Source. 16, p. 82. Quoted by Gouin, 1928.

Material Described. 10' of asphaltic S.S. and conglomerate in the bed of a creek.

General Geology. The beds dip about 1 Deg. N. or NE, and are about 40' below a sandstone cap of the high knobs in this Township.

Commercial Development.

Miscellaneous. See Card covering O.G.S. Lab Sample 199.

Comanche County (6) Dup.

From the unpublished notes of the Oklahoma Geological Survey which will probably be published later. Copies furnished to the present compiler for his personal inspection.

Field Sheet 199-4 Samples.

Se Sec. 32, T4N R11W. 7260 cu yds. Thickness 2'-4'.

Sample	Bitumen	Penetration	Residue	Minerals	Use
199-1	5.40%	High	Qtz Sd, Ls.	Oil Asph. Qtz.	Road topping. Floor sweep.
199-2	4.92%	Medium	Qtz Sd. Ls.	Asphalt Qtz. Ls.	Road topping
199-3	9.11%	Medium	Qtz. Sd. Ls.	Oil Qtz Sd	Road topping Floor sweep.
199-4	2.65%	Medium	Qtz Sd. 98% Ls. 2%	Oil Asph. Qtz. Calcite	Road top. Floor Swp.

See card of Lawton District. Gouin. 1928.

COMANCHE COUNTY

Frederic A. Bush Sinclair Prairie Oil Co. notes in the NW NE 34, T4N, R12 W. A water well at 42' depth showed oil.

(1)

5-2N-10W
CNWNESWSW
Comanche Co
~~28-2N-10W~~

WEStout
#5Kirkland
1964 Elev.?
perf. 450-580 sd IP 16 BOBD Gv. 36°
TD 602

On map

Coman

16-2N-10W
CSESWSWSE

Hackathorn
#2 School Ind - Od?
1964
Elev?

Lawton district
Comanche Co

Congl sand perf 911-916 TD 1066
IPF/96 BOPD 3/32" TC
Gravity 34°

Omitted

165

17-2N-10W
CSESESESE
Lawton district
Comanche Co

6/4/64
G&G Well Service #3 Schoolland
Oil Sand 492-510
perf. 938-46 in congl. Gravity 36°
not on map

ROR.

Comanche SWc/NE 24-4N-11W
Fort Sill North
Comanche Co
Prod from Penn sd @ 350, 8' thick
2 wells Dis. July 1948

Not in CC file

Check ROR ✓
Can not locate more info.
~~Omit from~~ ~~surface~~
w/ surface exp.

Scruls yearbook.
Omitted.

S/2 29-2N-10W
Comanche Co.
28-2N-10W
SWSW NW

Waterflood - Permian 300-450 feet
18 oil wells
W.R. Cook #36 Palmer - Pay 456-906 Gy 28°

ROR Sec Rec. 1962, p. 196

166

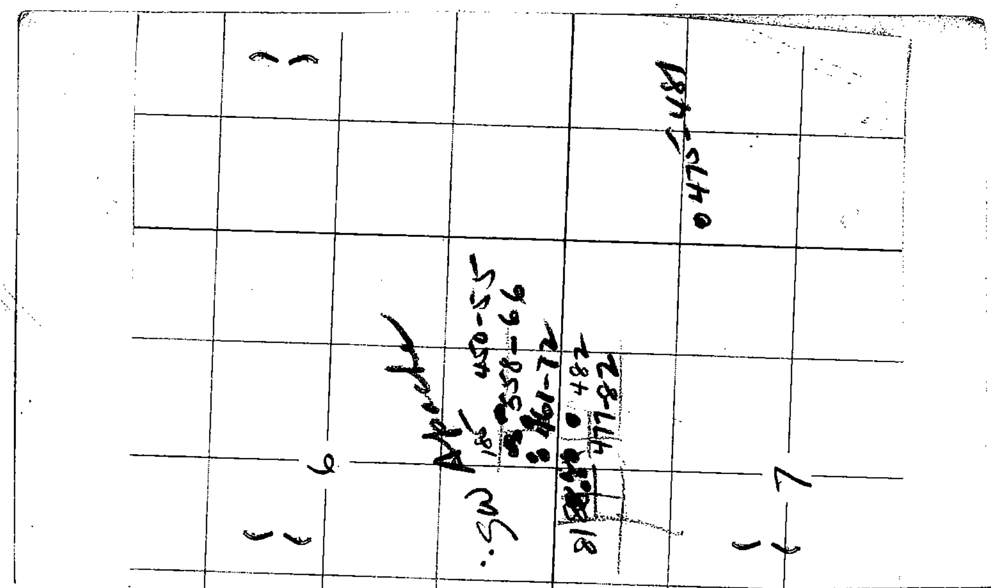
Comanche Co

SWSE ~~6~~ NWNE 7-4N-11W
SW Apache field

Oil wells from Permian ~~sandstone~~ 956
depth 81-495 feet Dec 1956.

On map
on list

Corp. Com. files



8-180 COUNTY COMANCHE Heavy SEC 21-2N-10W
FIELD LAWTON DIST Result OIL LOC C SW NE NE SW
OPER. CURTIS PRYOR ETAL
WELL# 7 FARM HARLESS COMP. 8-23-66

TODD DRLG (RT) SPUD 7-19-66; NO SURF CSG; TD 506 RATHMAN 4½"-506'-50 SAX; PERF (OIL SAND) 20/432-42 WATERFRAC 3.5# x 5 OIL SAND IP FLOW 14 BO/24 HRS, 1/8" CC FCP 20# GVTY 25 (PAY 432-42)	ELEV. RATHMAN TOPS OIL SAND 430 TD 506

OKLAHOMA COMPLETIONS

167

Sec. 27, T1S, R10W. ~~Name of Occurrence~~.

(1) Location. Cotton County. 4 Mi. W. of Baird. NE¼ Sec. 27, T1S, R10W.

Information Source. 16, p. 84.

Material Described. Outcrops of thin ledges of SS. through this section. Sample from this yielded light colored yellow distillate of petroleum when heated in test tube (Wegemann).

General Geology.

Commercial Development. None.

Sec. 8, T5S R10W Location. ~~Mouth of Cache Creek~~, Cotton County, SE¼ and SW NE¼ Sec. 8, T5S R10W.

Information Source. Carroll H. Wegemann, "Anticlinal Structure in parts of Cotton and Jefferson Counties, Okla." (1915) p. 67-68. U.S.G.S. Bull. 602.

The author describes a large seepage of gas in the bed of the creek at the mouth and showing for 2100' to the N. This was tentatively assumed to be natural gas and therefore to have a relation to petroleum. However Wegemann cites the following analysis by Dr. Burrell of the U.S. Bur. of Mines. He therefore concludes that the gas is merely "swanp gas" and of no value as indication of oil.

(over)

Burrell's analysis:

CO2	18.70
O	.50
CH4	77.00
N2	3.70

32-26N-20E
SWSWNW
Craig Co.

E. O. Jenkins #1 Green
196~~3~~ new field 242-246 sd.
TD 246 Burgess pnd.
pumping 3BPD

On map
5/65

CC

Also SENWNW

26N-20E

Craig Co. Okla
Uinita pool

19,20,21+29
~~190 acres in~~ 20, 29 + 19. 26N 20E
Waterflood - Burgess
Depth 220' 17 wells

On map

R. OR 1962 Sec. Rec. p. 300

4-26N-21E
SWNWNW NE
Craig

H+N Oil Co
#2 Garrison
Oil 94-105
4BPD 28° gravity 1957
#3 Garrison NESENENW On map
4BPD 28° gr. 1957
oil 94-105
2 BOPD NWNWNE
Porter #2 Garrison Burgess 101-114

Craig Co sec 1 27N-18E

not in CC.

Br oil ~~at~~ 350 ft

~~bottom cased well~~ low gravity oil OU map 5/64

B.O. 385 - 395 in C sec 1

Craig Co
21-27N-18E

Pare Oil Co. #32 DeVau CClog.
Br. oil 686-714 Below 500'

over

NWSWNE 18-27N-19E
Craig Co
Well in 1925 shows oil at 844
& at 1016 in Wilcox - says
dry - 8 bbls per day ~~[illegible]~~
Well csg set @ 976.

32-27N-21E
NWNENE

Craig Co

Ketchum Oil Co 1 Ayers OU map 5/64

Oil sd, Burgess 105-111'
3 BOPD

1955 SWNENE

1957 NAW 1 Ayers
6 BOPD

Oil sd - Miss 118-126

27-28N-18E
SENESW

Lane + Sears Drlg Craig
Hudgens 1

Burgess oil 632-668

Below 500'

Sandstone, petroliferous Craig Co.
along section ~~road~~, S line of SE 1/4 36-25N-20E

Atoka ss, 12' thick, exposed along road cut
for about 50'. C.C.B. 4/16/63

On map

Analysis by J.A.S. Aug. 16, 1963
Contains 3.8 percent petoliferous matter
= 76 2/3 #/ton.

4/15/63 Field Sheet

Craig Co

19-28N-19E
SENESE

Crown Corp of Texas #1 Spears
Bartlesville ~~240~~
Open hole 347-63 P 2 BO +
8 BWPD (pumping 4 hrs out of
24) 24° grav. T.D 363.
7/30/63

On map
5/65

28-24N-21E
Craig Co.
Atoka ~~ss~~ impregnated with bitumen
along Hy 82

on map

Doane called it Mus. ls.

O.G.S. Bull 77, p 103

Sec. 16 (1) (2)

Name of Occurrence. Robberson Field.

Location. Garvin County. The $S\frac{1}{2}$ of T's 1N R's 2 & 3 W. from Hennepin to Robberson.

Information Source. Eldridge 2 and 6, p. 34. Also A. 33 is covered by Shelley, 18, p. 25. Denison 1923, p. 630.

Material Described. Various Oil Seepages.

General Geology. In Permian Red Beds. Sample 33 in Shelley, 18, p. 25 (NW$\frac{1}{4}$ Sec. 16) Bitumen, 12.73% See also Denison 1923, p. 625.

Commercial Development. Aside from actual developments the following is quoted from Eldridge by Hutchison, 6, p. 34.

Miscellaneous. "At the western end of the Arbuckle Mountains, in the vicinity of Hennepin (T1N, R1W) Homer and Elk, and even as far west as Robberson (T1N, R3W) a number of oil seepages in the water of wells, springs, or prospect pits were reported to the writer. These were accepted as evidence of the general distribution of oil in as yet undetermined quantities—"

This is interesting in connection with a veiled conservative prediction of deep oil possibilities, which Eldridge reiterated in discussion of the Wheeler

Robberson Field 2

district in T3S,R2W.

Robert Roth. O.G.S. Bull, 40 p. 146 (1930) in re
The Robberson Field, Garvin County.
"In 1915 Pierce Larkin confirmed the presence of oil & gas in shallow water wells at Robberson two of which are in the NE$\frac{1}{4}$ sec. 16, T1N, R3W. (See opposite side this card). On his recommendation a block of acreage was secured by by McMan Oil Co." Later transferred to the Magnolia before development.
(Roth in the above does not credit this as a quotation from A.R. Denison, A.A.P.G. Bull, Vol. 7, No. 6. 1923. However Denison is the author of the directly quoted matter)

Sec. 20 T1N, R3W.

(3)

Name of Occurrence. Sample no. 34, 18, p. 25.

Location. NW Cor. Sec. 20 T1N,R3W. Garvin County.

Information Source. 18, p. 25. Sample 34.

Material Described.

General Geology. Occurrence in the Permian.

Commercial Development.

Miscellaneous. Further notes desired, but Sample 34 shows Bitumen, 10.51%

178

Sec. 24, T1N,R3W. Name of Occurrence. Sample No. 35 of 18, P. 25.

(4)

Location. Garvin County. Center Sec. 24, T1N,R3W.

Information Source. Shelley, 18, p. 25.

Material.

General Geology. In Permian.

Commercial Development.

Miscellaneous. Sample 35 is shown to occur in the Permian, Bitumen 2.13%.

Sec. 36, T1N,R3W. Name of Occurrence. Sample C.

(5)

See dup. card SW SE NW

Location. Garvin County. SE. SW. Sec. 36, T1N,R3W. See next card.

Information Source. 6, p. 33; 12, p. 160; 11, p. 6. 39. 18, p. 25.

Material Described. Sandstone saturated with asphaltic bitumen.

General Geology. The fine grained S.S. is Permian, varies from 5'-25'. Evidence of crumpling.

Commercial Development. No extensive development, but several prospect pits dug.

Miscellaneous. B.C. Belt report in 1911. See Okla. Geol.Survey for any Ms. notes. Sample 36 C in the Permian.

At Loc. No. (2) Shelley (1929) 18, pp. 9 & 25 reports:

Sample C. 3 or 4 miles S.E. of Pernell. In the Permian. Fine grained S.S. from 5 to 25' thick. Two small pits no development at head of a ravine capable of quarrying. Evidence of large amount of the material. The analysis shows 12.31% bitumen, but may not be representative of the entire deposit.

Garvin County Dup.

From Field notes and Lab tests of Oklahoma Geological Survey, copies of which furnished the present compiler for his personal inspection. See the same locality covered by card describing Loc. 2, Sample C.
SW. SE N.W Sec. 36 T1N, R3W. Field Sheet 30-1. Amount 1400 cu yds.

Lab Test:

Bitumen 3.86%
Penetration medium.
Residue Qtz Sd. 96%
Minerals Asphalt, Qtz.

Good material for road topping with addition of asphalt of high penetration.

Shelley 1929 (18) Table, Sample 36 (c) Dup.

10-2N-2E
SENESE
Garvin Co.

Shows of oil in Perm-Penn
sec 1700-1800'
+ in Simpson 2000-2100'

[illegible]

175

2-3N-2E
SWSWSW
Garvin Co.

Davon Oil #1 State
Simpson 17° gravity oil
2725-31 + 2735-39
Atom.

Grady County Sec Knox Pool (1)

Sec. 21, T3N,R5W. South of creek.
J.V. Howell is source of information. Asphaltic S.S. about 6" thick. Outcrop for 50'.

(Pending any further check the location is spotted on the map in pencil).

Sec. 10, T6N, R21W. Name of Occurrence. Granite.

(1) Location. Greer County, SE.NE.10 T6N, R21W. 4 Mi. NW of Granite.

Information Source. 6, p. 31, & 23

Material Described. Oil at shallow depth.

General Geology. Permian blanket on source formations. Heavy asphaltic petroleum viscous asphalt. Near base Red Beds, near igneous rocks.

Commercial Development. The above are not accurately

176

located. Should be check fully. The material was found at 168' depth in well of 30 bbls

Miscellaneous.

Sec. 33, T6N,R21W

(2)

Name of Occurrence. Ruggles Granite Quarry.

Location. About 2 Mi. W. of Granite , Greer County, possibly in Sec. 33 T6N,R21W.

Information Source. 6, p. 31.

Material Described. Semi-viscous bitumen.

General Geology. Hutchison (6, p. 31-32) discusses the occurrence, based on sample submitted. This sample of viscous asphalt came from 15' in solid granite.

Commercial Development. The Ruggles Granite Company produced granite, but the asphalt not developed.

Miscellaneous. Following: "It is therefore Thought that the asphaltic material locally impregnating some of the sandstones in the region under discussion had its origin in the older strata below the Permian and has since been transported to the superimposed Redbeds. The heavy petroleum discovered near Granite and Mangum are thought to be of similar origin, but it does not at first seem possible to attribute the origin of the bituminous matter at the Ruggles quarry to that source owing to its occurrence in Pre-Cambrian granite. The association of clay shale with the bituminous matter, at first suggests that the deposit is probably an inclusion within the granite. If such be the case the included material must be pre-Cambrian, for at contact of Cambrian sediments and the granite same is seen to be unconformable and without metamorphism. The shale with the bitumen does not seem to be altered. ---forces us to the conclusion that the material discovered was probably found in a nearly horizontal joint, where it had collected with the clay shale."

Sec. 33, T5N, R20W. Name of Occurrence. Hutchison, 6, p. 30 lists as Loc. #4.

(3)

335N20

Location. Greer County Sec. ~~33, T5N,~~ R20W. The location is not given sufficiently accurately.

Information Source. Hutchison 6, p. 30 states "The deposi occurs in S. bank of N. Fork of Red River. about 1½ Mi. W. of Lugert, 8 Mi. S. of Lone Wolf".

Material Described. Fine conglomerate with low % of asphaltic matter.

Commercial Development. Has not been operated.

Miscellaneous. Locations must be checked as to T, R. & Sec.

Name of Occurrence. Few Miles E. of Mangum.

Location. Greer County. T5N,R21W. Location is inexact.

Information Source. 6, p. 31.

Material Described. Heavy asphaltic production in dug well.

General Geology. Permian Red Beds outcrop, origin in the older strata.

Commercial Development. Oil discovered about 1901. When heavy oil at 168' a few miles W. of Granite.

Miscellaneous. Verify the exact location. Could not, therefore not carried on cross reference sheet.

Hughes Co. NWNW 25-5N-9E

Gerty, NW

Prod. @ 390', 10' thick, Penn. ss

Disc. 1954, Scout's Yearbook.

NWSWNWNW Perf. 396-406 P/24 BOPD. T.D.

SWNWNWNW 425-432 P/15 BOPD

NWSENWNW 332-337 P2 BOPD.

NWSENW 449-495 Senora P/10 +50SW

In sec SENENENE 26 414-28 P5BO

ON map

[illegible]

Hughes   9N, 10+11E

Wetumka

1st Wewoka sd. pnd. at 298'

14' thick. dis. October 1956.

38 acres.

Can not locate

Scouts year book.

Can not locate in ROR.

Sec. 21, T3S,R4W.   Name of Occurrence. Dixie-Asphaltum District.

(9)

Location. Jefferson County. On the Sessum farm in SE$\frac{1}{4}$ SW$\frac{1}{4}$ Sec. 21, T3S, R4W.

Information Source. 14, p. 39.

Material Described. "Water of a well on the Seszum farm tastes slight of petroleum at 119'.

General Geology.

Sec. 29, T3S,R4W.   Name of Occurrence.

(10)

Location. Jefferson County. NW NW Sec. 29, T3S, R4W.

Information Source. 14, p. 39. Weggemann.

Material Described. Asphalt reported in an old well.

Commercial Development.

General Geology.

Miscellaneous. See also Sessum well Sec. 21, T3S,R4W.

Sec. 30, 31, T3S, R4W.

(11) (12) (13)

(14) (15)

Name of Occurrence.
Asphaltum District.

Location. Jefferson County.
Secs. 30, & 31, T3S, R4W.
Numbered occurrences below.

Information Source. Wegemann 14, p. 31,42.

Material Described. (1) NE. NW. Sec. 31. Sulphur water in dug well. (2) NW. SE. Sec. 31. Outcrop of lower asphaltic bearing sandstone. (3) SE.SW.Sec. 31 At 43' in dug well petroleum odor. (4) SE.SE. Sec. 30. At 54' in water well of E.A. Burton, impregnated with asphalt.

Commercial Development. Not developed.

(5) James R. Bunn. O.G.S. Bull. 40-PP, 1930, p. 368. Under heading "Direct evidence of oil and gas accumulation" the following : "A large asphalt or tar seepage occurs in the bed of Tar Branch in the SE. of Sec. 31, T3S, R4W.

Sec. 32, T3S, R4W.

(17) (18) (16)

Name of Occurrence. Asphaltum ~~Distri~~ ct. Location # 2 omitted from Hutchison 6, p. 32 although it is there referred to.

Location. Jefferson County. Loc.?? Probably in Sec. 32, T3S., R4W. (1 Mi. W. of NE$\frac{1}{4}$ sec. 33)

Information Source. 6, p. 32. 14, p. 38.

Material Described. (1) Sand Asphalt. (2) NW.NW. Sec. 32. Sulphur water in well. (3) SE.NE. Sec. 32, Asphalt 40' in well.

General Geology.

Commercial Development. Not developed.

Miscellaneous. Apparently this occurrence accidently omitted from Hutchison, 6, p. 32 in which reference is made

Ben Belt's field notes of the O.G.S. (1909) probably describing Loc. (1) on the reverse of this card the following:

NW NE Sec. 32, T3S, R4W. The land is owned by Forsithe (?) Asphalt occurs in find SS about 20' thick, outcropping on Tar Branch. Also asphalt outcrops in

NE NE Sec. 33, probably along a fault line. The general dip is S45W, the strike is N45W. Overburden 1-4'. Loc. about 4 miles from Dixie. Has never been worked (as of 1909)

Sec. 33, T3S, R4W.

(19) (20)

Name of Occurrence. Hutchison (6, p. 32) lists as Loc. #3.

Location. Jefferson County. NE. ¼ Sec. 33, T3S, R4W. 15 Mi. W. of Wheeler.

Information Source. 6, p. 32; 11, p. 6; 12, p. 160; 14. p.39.

Material Described. Sand asphalt. This Loc. #3 is contin uouation of Loc. # 2 in Sec. 32.

General Geology. In Permian Red Bed.

Commercial Development. Undeveloped. Prospected only.

Miscellaneous. Loc. No. 2 above Wegemann (p. 39) states sulphur water in shallow well.

Ben Belt in discussing NE. Sec. 33, refers to the NW NE Sec. 32 (reverse side) as probably along a fault line.

Jefferson County

From the Field notes of the Oklahoma Geological Survey furnished for this compiler's personal inspection. Field Sheet No. 15- 1 sample (In Circular No. 19) Sample 15-1 SE NE NE Sec. 34, T3S,R4W. obtained from outcrop in the road. Test pit 100' from the outcrop. Poor saturation. Thickness 5'. On Co. Highway 5½ miles from Ringling.

Lab Test Bitumen with content too low for any commercial value.

Sand Asphalt

(21)

Secs. 23, 24, 25, & 26
T 3 S, R 5 W

Name of Occurrence.

Location. Jefferson County, Secs. 23, 24, 25, & 26, T3S,R5W

Information Source. Wegemann, 14, p. 37-38 Shelley , p. 25, 18.

Material Described. For occurrence. (1) Sec. 25 see other card. (5)
(2) Sec. 25 see other card. (6)
(3) NE. NW. Sec. 26 Asphaltic S.S. (7) dipping SW. (2)
(4) NE. SE. Sec. 23 Asphaltic S.S. dipping to Sw. (2)
(5) NW SE Sec. 23. Outcrop of asphaltic S.S.

---

(6) SW¼ Sec. 24. Outcrop of asphaltic S.S.
(7) SW SE. Sec. 24 " " " "
(8) Reported asphalt in well 48' deep.

Shelley (1929) describes (1) above P. 25, as in Permian, Bitumen 8.88%.

see also copy of O.G.S field notes furnished 2/8/44.

Ben Belt's O.G.S. field notes (1909) show (corresponding probably to 2 and 2A on reverse side) the following:

NE NW & NW NE & S½ NE Sec. 25, T3S, R5W. Segregated Asphalt lands. Mine operated by ---- The product was hauled to Comanche by wagons. At one time there was a refinery, but it burned and the mine has not since been worked. Asphalt impregnates a fine SS of Permian. The rocks dip generally to the SW, but here the dip is S25E about 3 Deg. Stroke is S65W. The impregnation may be along a fault line but if so no fault appears; or it may be that the oil has slowly leaked up through the Permian. In a well near Loco a heavy oil at 180' probabl under most of Sec. 25 there is asphalt, as it occurs wherever a creek has removed the heavy SS from above. The overburden, 3-10' increases under the hill. Stripping is the best method for quarrying. The deposit is about 25' thick and outcrops for about 100 yds.

See duplicate Loc. card.

Field Sheet 4 Samples 4 & T are probably same as No. 1 in the other Shelley-Wegemann card. SE NW Sec. 25, 3S-5W.

4-4	10.2%	Medium	Qtz Sd.	Asphalt Qtz.	Road topping if blended Floor sweep base
4-5	3.03%	Medium	Qtz.	Asphalt Qtz.	Road topping.

(6)

Tar Springs Asphalt Co.	Sec.	Twp	Range	Acres
S.W.N.W.	25	3S	5W	40
N.W.S.E	25	3S	5W	40
N.E.S.W.	25	3S	5W	40
Total				120

J.A. Taff in U.S. Dep't of the Interior Circ. No. 6, (1904) P. 8-9:

"Tract No. 1. The Tar Springs asphalt lease bounds this tract on the South and East and the deposit apparently continuous thru the tract and lease. Viscous or semi-liquid bitumen impregnating a compact but unconsolidated sand. On extracting the bitumen the residue is a fine gray or white sand. The deposit lies flat or slightly inclined westward reported to be 4' to 6' thick. It is exposed or near the surface. The Tar Springs Co.

185

reports a yield on an average of more than 10% Bitumen. The bituminous sand weighs 2800 lbs per cu yds., therefore the yield 280 lbs per cu. yd. of bitumen, or 1390 to 2080 tons per acre. The output by measure would be 34700 to 52100 gals per acre."

Tar Springs Asphalt Co. 2

14, p. 37 "The largest exposures of asphaltic S.S. lie in Secs 23, 24, 25 (See 2 on opp. side this card) and 26 T3S. R5W and outline in cross section an anticline the axis of which trends in N.W. direction."

See also further as to oil possibilities in agreement with Former expressions of Eldridge, Taff et al.

14, p. 37 "The asphalt-bearing S.S. in this area are so impregnated with asphalt as to make it seem probable that they represent former oil sands which have brought to the surface by erosion, the petroleum in them being oxidized to asphalt."

(20)

13-2 is probably same as shown on the other card as named above in NE SE Sec. 23, T3N, R5W.
4.22% Low Qtz. Sd. Qtz. Asph. (4) Road topping.

Further Field Sheet 4-5 samples of these, 1, 2, & 3 are in NE SW Sec. 23, T3S, R5W.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
4-1	0.05%	Medium	Qtz. Sd.		Bitumen too low. Thickness 4'.
4-2	18.5%	Medium	Qtz.	Asph. Qtz Sand	Toad topping Thickness 5'
4-3	2.44%	Medium	Qtz. Sd.	Qtz. Oil Asphalt	Road topping if blended.

Jefferson County. Dup.

From Field notes and Lab tests of Oklahoma Geological Survey. Copies furnished the present compiler for his personal inspection. See also the many section cards of Shelley and Wegemann, and the same localities there numbered 5,6,7.

(3)

Field Sheet 13-1 NW SW Sec. 24; 3S-5W Location # 3.

Sample	Bitumen	Penetration.	Residue	Minerals	Use
13-1	9.93%	High	Qtz Sd.	Oil, Asph. Qtz.	Floor sweep. Road topping.
13-1Re run	10.7%	Medium	Qtz Sd.	Oil Qtz Asphalt.	Road topping if mixed with low Pen.

Sec. 25, T3S R5W.

(5) (6)

Name of Occurrence. Tar Springs. Asphalt Co. (as of 1904) Hutchison lists Loc. #1.

Location. Jefferson County. Segregated 160 Ac. Cent. Sec. 25, T3S, R5W. 120 Ac. leased to above

Information Source. 6, p. 32; 12, p. 160; 11, p. 6; 14, p. 31; 39 Shelley (1929) p. 25.

Material Described. Sandstone ledge 25' thick carrying asphalt.

General Geology. In Permian Red Beds. Exposure of 100

Yds. outcrop. Local crumpling, dip 3 Deg, S25E.

Commercial Development. Co. leased tract is 120 Ac. E½ & SW. in 1904. Refining plant early built; later burned. Then hauled sand asphalt to Comanche for shipment.

Miscellaneous. Suitable for hillside quarrying.

Wegemann , (14, p. 31) Unsuccessful attempt by Tar Springs Ref. Co. with works built just S. of Cent. of the Sec. 25, in 1903. Later burned down the refinery

Dry hole at 1000' N.E. of the asphalt pit to T.D. 700'.

See grahamite in 6, 2S 4 W. Stephens County.

Sec. 27, T3S, R5W. Name of Occurrence.

(8) Location. Jefferson County on Negro Creek, 5 Mi. S. of Loco. NE NW¼ Sec. 27, T3S, R5W.

InformationSource. 14, p. 39. Wegemann.

Material Described. "An asphalt seepage known as the Tar Spring occurs what is believed to be the lower or asphalt bed."

General Geology.

Commercial Development.

JEFFERSON COUNTY

J. A. Taff, "Description of the Unleased Segregated Asphalt Lands in the Chickasaw Nation, Indian Territory". U.S. Dep't Interior, Circ. No. 6, p. 7-13.

Tract No. 1 unleased SE.NW¼ Sec. 25, T3S,R5W. The Tar Springs Asphalt Co's lease bounds this on the S. and the E. (See map) The deposit is continuous. Viscous bitumen is the binding cement of the sand. The deposit lies flat. On the adjoining lease Tar Springs the yield is 10% or more. The Bituminous sand weighs 2800 lbs per cu. yd. and will yield 280 lbs. of bitumen per cu yd. or 1300-2080 short tons per acre, or by measure, 34700-52100 gals. per acre.

John R. Bunn, Jefferson County, O.G.S. Bull, 40-PP, 1930,

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p. 370. Discussing the Stallings Structure which is located in secs. 21, 22, 23, 25, 26, 27, T3S, R5W. near the old town of Asphaltum:

"There are numerous tar seeps and the S.S. are heavily impregnated with asphalt on the higher structural points of this fold. This sturucture might be termed a "fossil" oil field, in that these saturated S.S. were once buried oil sands and are now exposed by erosion. The saturation of these upper beds is positive proof of existing structure or the intense shallow accumulation would not have taken place. The most prominent tar seeps and asphalt occurrences are in the SW¼ sec. 24, the central part Sec. 25, near the W. line of NE¼ sec. 26, and in NW¼ sec. 27, T3S, R5W. (See various cards)

Some minor gas seeps were observed in sec. 25, and

188

Jeptha Stallings, pioneer resident, states very strong gas seeps that sometimes throw overburden of water 5' high." in times of high water floods.

See Bunn's description of Asphaltum.

(2~~3~~4) Jefferson County

From Field notes of Oklahoma Geological Survey furnished for the present compiler's personal inspection.

Field Sheet No. 14, Sample 1, NW SE Sec. 11, T4S, R4W.

Sample	Bitumen	Penetration.	Residue	Minerals	Use.
14-1	3.31%	Medium	Qtz. Sd.	Oil Qtz. Asphalt	Road topping if blended.
	The above deposit is ½ mile from the County Hiway. That leads to Ringling. Thickness not known.				
14-2	SW SW Sec. 11, T4S, R4W. obtained from small outcrop. Thickness 10". The deposit is about 3 mile from Ringling, 1/8 mile off the County highway.				
14-2	1.20%	Medium	Qtz Sd.	Oil, Asph. Qtz.	Too low in Bitumen.

Jefferson County (25)

From the Field notes and Lab test of Okla. Geol. Survey Copy furnished the present compiler for his personal inspection. This is the only source of information on this occurrence.

Field Sheet 1-6 Samples.

NE Sec. 15, T4S, R4W. Does not outcrop. Deposit extend NW-SE over about 400'; width about 25'. The location is 3 miles N. of Ringling.

Sample	Bitumen	Penetration	Residue	Minerals	Use
1-1	5.97%	Low	Qtz Sd 98%	Qtz.Sd Asphalt	Road material if blended.
1-3	Asph 4.696%	Medium	Qtz Sd 96%	Asphalt Oil, Qtz.	Road material if blended.

1-4	9.62%	Medium	Qtz Sd 99% Qtz.	Asph. Oil	Road topping if blended.
1-5	5.74%	Low	Qtz Sd 98% Qtz.	Asph, Oil	Road topping if blended.
1-6	11.70%	Medium			
1-1 Re sample	11.6%	High	Qtz.Sd.	Oil Asph. Qtz.	Road topping. Floor Sweep.

Add Sample 1-7. Bitumen 0.10% Content too low for commercial value.

21-3S-5W
NENESE
Jefferson Co

Massad #1 Featherston
Sand - Permian 200-212TD
3-18-1950
IP P3 BOPD from open hole
200-212'
this sand produces in NE 1/4 22
but absent in SE NW NW sec 27

Former hozo in-situ project

21-3S-5W
E/2 NESE
Jefferson Co
Ponder & Dover #2 Featherston
Sandstone at 200' Permian
IP P3 BOPD from open hole
200-212 TD
gv. 19
sd 189-218
Scout ticket Produces also in NE/4
22-3S-5W
Site of hozo in-situ project

(1)

Johnston County

From field notes of the Oklahoma Geological Survey. Copies furnished the present compiler 2/8/44 for his personal inspection.

Field Sheet N_o. 66 - 4 samples: Loc. SW. Sec. 21, T1S, R7E.

The deposit located 3½ miles E. of Connerville; 8 Mi. to the R.R. at Bromide. The thickness is about 10-12' A large amount of asphalt.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
66-1	4.20%	Very Low	Qtz. Sd. 98%	Qtz. Asph.	High grade material for road topping.
66-2	4.20%	VeryLow	Qtz. Sd. 95%	Qtz. Asph	Needs to be blended with Ls Aggregate
66-3	10.06%	Very Low	Qtz. Sd 95%	Qtz. Asph	Same as the 2 above.
66-4	5.93%	Very Low	Qtz Sd 95%	Qtz. Asph	Same as the 3 above.

Good for Road Material

Johnston County (2)

From Field notes of the Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field Sheet No. 67 - 2 samples. Loc. NE SE SW Sec. 27, T1S, R7E. Property of a Loan Co. Width of exposure 50'. Dug 3½' in sand deposit.

Lab Tests.

Sample	Bitumen	Penetration	Residue	Minerals	Use
67-1	0.73%	High	Qtz Sd.		Too low in Bitumen content.

67-2 Located in NW NE Sec. 33, T1S, R7E. (3)

67-2	0.75%	High	Qtz. Sd.	Too low in bitumen.

Deposit of Sample 2 owned by Joe Cole has exposure of about 300 yds. along a bluff 15'-20' high.

Harkness Farm Prospect 2

bed. The richest part of the rock is soft and gummy. Six per cent of ~~the~~ bitumen is perhaps the maximum."

This occurrence is listed by Hutchison, 6, p. 68, as Loc. #3.

Johnston County (4)

S.E. NE. SE Sec. 18, T3S R4E, 1 mile E. of the Johnston-Carter County line. Light oil seepage out of Sycamore Limestone.

Johnston County. (6)

From Field notes of Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection. 32 on field sheet

Field Sheet No. 93- 3 samples. SW Sec. ~~23~~, T3S, R5E.

In quantity said to cover about 9 acres. At test No. 1 the exposure is 34' thick. Overburden averages 3'. The deposit can be worked by buidling about ½ mile of road, but apparently has not been worked.

No lab tests are given on the 3 samples.

Amount of deposit 165,000 bu yds.

In Simpson SS.

No (5) present
SG. 1963

Sec. 1, T4S,R4E.

(9)

Name of Property. Lease of 478, 7 Acres operated by the Ravia Asphalt Co. Separately itemized:

Location. Johnston County. NE¼ Sec. 1, T4S, R4E. 4½ Mi. W. of Ravia

Information Source. 6, p. 68, 11, 12, p. 163.

Material Described. Sand asphalt

General Geology. A Pit (75' x 100') opened at base of Cretaceous Trinity. Structure monoclinal to S 3 Deg. E. No faulting. The older rocks dip to SW.

Commercial Development. About 1903 Ravia Asphalt Co. sold to Barber Asphalt Co.

(2) Location. Johnston County. (10) NW¼ Sec. 6, T4S,R5E.

(3) Location. S½SE.Sec. 36, T3S,R4E.

(4) Location.S½SW. Sec. 31, T31,T3S, R5E.

Commercial Development. Operations (if any) on the last three tracts named to be added to the above.

Abraham (1938) P. 163: Quarry 75 x100' in stratum 6' thick, with overburden of shale. Contains 2½ to 13% asphalt, averaging about 7%. Crude material contains

Ravia Asphalt 2

65-75% soluble in H.Cl(limestone) and 15%- 20% mineral matter insoluble."

Johnston County

From Field notes Oklahoma Geological Survey. Copies furnished the present compiler for his personal inspection 2/8/44.

On Field Sheet No. 5 were two samples in NW SW SW Sec. 2, T4S, R4E. Theseesaid to have been 20' in diameter, half filled with trees. Evidence they had been mined some time. No evidence of outcrop of coal mearby. No Lab tests are given in the copy.

No evidence of any application to Asphalt therefor excluded

(?)

Omitted DG 1963

Johnston County. (8)

From Field notes of the Oklahoma Geological Survey, furnished to the present compiler for his personal inspection 2/8/44.

Field Sheet No. 1- 1 sample.

SW NW Sec. 1, T4S, R4E. The deposit was in an old mine on E. slope of Ls. ridge.

Lab. Test.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
S-1	4.34%	Low	CaCO3-79% Qtz Sd 21%	Asphalt Qtz. Calcite, Oil	Road material

Field Sheet 4- 4 samples. Same Loc. as Loc. 1 of other card which covers Ravia Asphalt Co. ppoperty . Found in old mine on E. slope of a Ls. ridge (as above) This Ls. is of Trinity. The asphalt is in S. S. and Conglom. of the Trinity. To the N., in 36-3S-4E, occur Paleozoic rocks, The mine was worked in 1904-1905.

(5)

Sample	Bitumen	Penetration	Residue	Minerals	Use.
4-1	11.89%	Low	Asph Ls & clay 95% Qtz 5%	Asph Qtz Oil calcite	Road topping
4-2	7.02	Medium	Asph Sd. Ls & Clay 90% Qtz10%	Asph. Calcite, Oil Qtz.	Road material if blended.
4-3	8.38%	Low	Asph Clay 70% Qtz Sd. 30%	Asph Qtz Oil. Clay	Road topping if blended.
4-4	8.02%	Medium	Limy clay100%	Calcite Clay	Floor sweep base.

Johnston County (10)

Ira Cram. His paper at Tulsa Geol. Soc. Feb. 21, 1944 is said by Mr. Borden, also of the Pure Oil Co., to have referred to Simpson-containing oil which was found in the N½ Sec. 13, T4S, R5E. See the published verified location of a Trinity occurrence, with analysis, which was located in NE Sec. 14, T4S, R5E. These are here assumed to be separate occurrences until further evidence may be obtained to dispute that conclusion.

See Cram's map and letter. (11)

NE SE NW 13-4S-5E in Tulip Creek bed

Also Oil seep in Sand Creek.

Sec. 14, T4S,R5E.

(11) Dup.

Name of Occurrence. Hutchison, 6, p. 68, lists as Loc. 2".

Location. Johnston County. NE¼ Sec. 14, T4S,R5E. 1 mi. N. of Randolph.

Information Source. 6, p. 68; 11, p. 12, 12, p. 163. 18, p. 25, Sample No. 63.

Material Described. Fine grained conglomerate member of Trinity. 4-5% Bitumen. Rock Asphalt.

General Geology. The conglomerate is about 6' thick.

Crossbedded.

Commercial Development. Not prospected.

Miscellaneous. Shelley (1929) 18, P. 25, Sample No. 63; in Trinity S.S., with bitumen, 2.45%.

The same occurrence described in Field Sheet 94-2 samples. See card covering the copy furnished this compiler 2/8/44. O.G.S. Bitumen 2.94% Amount 10,000 Cu. Yds.

See also Ira Cram paper at Tulsa early Bed and loc. in adjoining Sec. 13 T4S R5E. Feb

Johnston County (11) Dup.

From the Field notes of Oklahoma Geological Survey, Copy furnished to the present compiler 2/8/44, for his personal inspection.

See also the same deposit subject of Shelley's sample No. 63 accompanying card.

Field sheet No. 94-2 samples. Loc. E½ of NE Sed. 14, T4S, R5E. Estimated to contain 10,000 cu.yds. the thickness is 4'. The deposit is 2 miles E. of Ravia in ravine near Washita River. Formed in sedimentary sand deposit.

Lab. Tests:

Sample	Bitumen	Penetration	Residue		Minerals	Use.
94-1	2.94%	High	Qtz Sd Ls.	90% 10%	Oil,Asph. Ls.Qtz.	Low bit. needs mixing with high Pen Asphalt.

94-2	3.85%	High	Qtz. Sd. 96% Ls. 4%	Oil, Asph Qtz Sd. Ls	Road topping if mixed.

Sec. 19, T4S, R6E.

(12)

Name of Occurrence. Hutchison 6, p. 69, lists as Loc. #4. Sample 61 of 18, p. 25 Table of tests.

Location. Johnston County. SE¼ Sec. 19, T4S, R6E. 2 Mi. N. Randolph and SW¼ Sec. 20, T4S, R6 E.

Information Source. 6, p. 69; 11, p. 12; 12, p. 163; 18, p. 25.

Material Described. Very rich sand Asphalt.

General Geology. The occurrence like others in this County is in the Trinity Fm. Impregnated S.S. exposed to depth of 6-8'.

Commercial Development. The deposit has been prospected by open cut 20' x 50'. Oil oozes from bottom. Not developed although richness and nearness to transportatio good.

Miscellaneous. Shelley (1929) p. 25, Table of tests. Sample 61 shows in Trinity, with bitumen 4.23%.
See Oklahoma Geological Survey Field sheet 14, 2 samples. Card covering.

Johnston County (12) Dup.

From Field notes Oklahoma Geological Survey. Copies furnished the compiler of these cards 2/8/44 for his personal inspection.

This occurrence is notes on another card with reference to Hutchison, Shelley et al.
Field sheet No. 14- 2 samples. Loc. SW SW Sec. 20, T4S, R6E. Area of 5 acres, E. slope Teller Mtn. 2-4' thick.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
14-1	6.54%	High	Asph.Qtz Sd 98%	Asph, Oil Qtz.	Road topping if blended.
14-2	8.40%	Medium	Asph.Sd98% Qtz 2%	Asph Oil Qtz	Road topping if blended.

Sec. 27, T4S, R8E.

(13)

Name of Occurrence. Sample L. of Shelley (1929).

Location. Johnston County. 12 Mi. E. 2 Mi. S x W of Folsom Ro SW¼ Sec. 27, T4S, R8E.

Information Source. 18, P. 11 & 25.

Material Described. Asphaltic sand. Bitumen cement.

General Geology. In Trinity S.S. of Lower Cretaceous. The sand is fairly extensive, and about 1' thick. The bitumen lies about horizontal. The bitumen content of the sample L. is 9.32% (over)

Probably this is not the same occurrence as that one described on Field sheet No. 89 of the O.G.S., as in SE¼ of the same section. See the other card.

Johnston County. (14)

From field notes of Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

This is apparently an additional occurrence to that described on another card as in SW$\frac{1}{4}$ of same section, and Shelley's Sample L therefrom.

Field sheet No. 89- 3 samples. Loc. SW SE Sec. 27, T4S, R8E. Outcrop is 250 yds long, and 105 yds wide. Estimated 100,000 cu yds. It is found in Trinity sand overlain by Ls.

Lab tests:

Sample	Bitumen	Penetration	Residue	Minerals	Use.
89-1	2.6%	Medium	Qtz Sd.	Asph Qts	Road topping.
89-2	9.28%	Very high	Qtz Sd	Oil, Asph Qtz	Road topping Floor Sweep base.
89-3	8.82%	High	Qtz Sd	Oil, Asph Silica	Road topping but must be mixed with high Pen, Asph.

Sec. 29, T4S, R8E. (15)

Name of Occurrence. Sample No. 60, 18, p. 25.

Location. Johnston County. SW NE$\frac{1}{4}$ Sec. 29, T4S, R8E.

Information Source. 18, p. 25 Sample No. 60.

General Geology. Shelley's (1929) Sample 60 shows; in the Trinity S.S. with bitumen content, 4.90%.

Commercial Development.

Miscellaneous. The location as above is given by Shelley in Table 2. On another card O.G.S. field notes furnished 2/8/44 Sample 26-8 although in the same section are in the SW of NE. Sec. 29.

Johnston County (16)

From Field notes Oklahoma Geological Survey. Copies furnished the present compiler 2/8/44 for his personal inspection.
This occurrence is possibly a separate one from that shown on the card which covers Shelley's sample 60.
Field Sheet No. 26-8 samples SW NE Sec. 29, T4S, R8E.
The deposit is in bed of ravine, exposed 200' up. A matrix of sand overlain by Ls.
Lab Tests.

Sample	Bitumen	Penetration	Residue	Minerals	Use
26-1	0.58%	Low	Qtz Sd. 100%	Asph, Oil Qtz.	Too low content.
26-2	4.91%	High	Qtz Sd 100%	Asph. Oil Qtz	Floor Sweep base.
26-3	5.64%	High	Qtz Sd. 99%	Asph.	Road material.
26-4	1.82%	Medium	Qtz. Sd 100%	Asph. Oil Qtz.	Road material
26-5	5.78%	Medium	Qtz Sd.	Asph Oil Qtz	Road topping if blended.
26-6	3.4%	Medium	Qtz. Sd. 100%	Asph. Oil Qtz.	Road topping if blended.
26-7	0.68%	Low		Asph Oil Qtz	Too low.
26-8	5.36%	Low	Qtz Sd. 100%	Asph. Qtz	

Sec. 2, T5S,R7E.

(17)

Name of Occurrence. Harkness Farm Prospect. 3 Mi. SE. Emet NE 36-4S-7E.

Location. Very inexactly described, but probably SE¼ Sec. 2, T5S,R7E. ~~Johnston~~ County.

Information Source. 6, p. 68; but mainly as shown below. 2, p. 318.

Material Described. See below Bituminous cementing material. Maximum 6% bitumen.

General Geology. See below,in horizontal Trinity Fm.

Commercial Development. One or two prospect pits.

Miscellaneous. Hutchison, 6, p. 68, quotes the Report by Eldridge (2) of 1902.

"This deposit of bitumen, in practically horizontal Trinity (Lower Cretaceous) sandstone, occurs on the A.C. Harkness farm 3 miles SE. of Emet, within a short distance of the line between 15 and 20 miles from railroad and has received little attention. 1 or 2 prospect pits within an area of ½ mile have been sunk into the S.S. that lies immediately beneath the surface but the extent and continuation of the impregnated rock are not known.---(The conglomeratic rock is described) ---Bitumen although in varying quantity, is probably the chief cementing substance, but a small amount of oxide of iron is visible in the unimppegnated protion of the

Johnston County (18)

From field notes Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field Sheet No. 92-3 samples. in NE NE Sec. 4, T5S, R7E. The outcrop is about 400 yds long and averages 4½ ' thick Total estimated at 60,000 cu yds. Overburden of Ls for 1' to 10' deep. No further Lab tests on any of the 3 samples.

8 Miles SE. of Tishomingo

J.A. Taff, "Description of the Unleased Segregated Asphalt Lands in the Chickasaw Nation, Indian Territory. U.S. Dep't Int. Circ. 6, 1904.

JOHNSTON COUNTY.

Kiowa County

From field notes of Oklahoma Geological Survey. Copy furnished this compiler 2/8/44 for his personal inspection.

Field Sheet No. 174.

A-CNW SW Sec. 14, T2N R18W., 45,000 Cu yds., Area 200 Yds by 75 Yds by 9' deep.

(14)

B-CNW NE Sec. 14, T2N R18W., 2,000 cu Yds. Area 50 Yds by 60 Yds by 2' deep.

Overburden 0-2'.

No other information, character of material, etc., is available.

Sec. 22, T5N, R20W.

(13)

Name of Occurrence. Hutchison locates as Loc. #4, 6, p. 30. Kiowa County.

Location. Inexact. 1½ Mi. W. of Lugert; 8 Mi. S. of Lone Wolf. Probably SW¼ Sec. 22, T5N, R20W.

Information Source. 6, p. 30.

Material Described. Fine conglomerate with low per cent asphalt matter.

General Geology. The rock is lenticular; an outwash from the near mountains.

Commercial Development. Not sufficiently prospected and not promising account of low asphalt %.

Miscellaneous. The deposit is S. bank of North Fork of Red River.

Sec. 32, T. 6N, R14W. (12)

Name of Occurrence. J. H. Maddern Farm.

Location. Kiowa County. SW SW¼ Sec. 32, T6N,R14W.

Information Source. 16, p. 84.

Material Described. Reported oil in a water well.

General Geology.

Commercial Development.

Sec. 2, T6N,R15W. (2)

Name of Occurrence. Givens Farm.

Location. Kiowa County N. of Sedan NW¼ Sec. 2, T6N,R15W.

Information Source. 16, p. 84.

Material Described. Merely a report by Wegemann of oil in a well, presumably a dug well.

General Geology.

Commercial Development.

Miscellaneous.

N. Sedan oil field NESE 11-6N-15W
(atdnd)

Av. depth 230

Disc 1956

Oil Scout Yearbook 1962 (Rev. of 1961)
p. 238

Sed. 11, 12, 13

(3) (4)(5)

Name of Occurrence.
(3) ~~(1) Van Kirk Farm~~
(4) ~~(2) T.A. Cook Farm~~
(5) ~~(3) Underwood Farm.~~

Location. Kiowa County
(1) NW$\frac{1}{4}$ Sec. 11
(2) SW$\frac{1}{4}$ Sec. 12
(3) NW$\frac{1}{4}$ Sec. 13
All of T6N,R15W.

Information Source. 16, p. 84.

General Geology.

Commercial Development. None.

Miscellaneous. (1) A scum of oil on water in a well. (2) A water well said to have had shows of oil & gas. (3) Gas found in water well. All these and others are reported without comment by Wegemann (16, p. 84)

Sec. 19, T6N,R15W. Name of Occurrence. Reynolds Farm.

(6)

Location. Kiowa County. SE.SE¼ Sec. 19, T6N,R15W.

Information Source. 16, p. 84.

Material Described. A showing of oil seen by Wegemann at depth of 42' in well.

General Geology.

Commercial Development. None; only an observation in the field.

Sec. 23, T6N, R15 W

(8) (7) (9)

Name of Occurrence. Kiowa County

Location. (1) SE. SE.SW¼ and (2) NW NW¼ Sec. 23, T6N,R15W SE of Sedan.

Information Source. 16, p. 84.

Material Described. (7) (1) Oil bailed from a well on the Fox Farm, at 75'. (8) (2) Oil in a well at 100' (9) (3) SW.SW¼ Sec. 23, Oil at 90' in well.

Commercial Development.

Miscellaneous. Wegemann cites these as "reports" of whic kind there are several others in this Township.

Sedan oil field NWNWNW24-6N-15W

Av. depth 310'

Disc 1956

Sec. 29, T6N,R15W. Name of Occurrence. About 8 Mi. SE of Gotebo

(10) Location. Kiowa County. NW$\frac{1}{4}$ Sec. 29, T6N,R15W.

Information Source. 16, p. 84.

Material Described. "Rainbow" of oil in a water well about 80' deep.

General Geology.

Commercial Development. None, and Wegemann's short comment on the report is indecisive.

Sec. 31, T6N,R15W. Name of Occurrence. Sugar Creek showings.

(11) Location. Kiowa County. SW.SW$\frac{1}{4}$ Sec. 31, T6N,R15W.

Information Source. 16, p. 84.

Material Described. Reported "showing" of oil in water well.

GeneralGeology.

Commercial Development. None. Only a report.

Miscellaneous. Further report (not verified) that oil seep from banks of Sugar Creek in E$\frac{1}{2}$ Secs. 32 and 29.

Rainey Mt oil field 10-6N-16W
disc. 1957
Wells in NE 1/4, av. depth 320'
Disc 1957

Komalty oil district T6N, R 16, 17W
Average depths of 3 pay zones
ranges from 285 to 500'
Disc 1949
In 1962, 346 wells total drilled
336 on artificial lift
Prod to 1/1/62 1,582,000 Oil Sumt Yearbook 1962 p 238

207

Sec. 13, T7N,R15W.

Name of Occurrence. Two Mi. S. of Mountain View.

(1)

Location. Kiowa County.
NW¼ Sec. 13, T7N,R15W.

Information Source. 16, p. 84.

Material Described. Wegemann gives unverified report that a 40' well drilling for water had a "pocket of oil" at that depth.

General Geology.

Commercial Development. None; report only.

East Gotebo Field
19 - 7N - 15W

Oil wells producing from less than 450 ~~feet~~
discovered 1956. Prod to 1/1/1962 32,322

Gotebo field + E ~~Gotebo~~
15+21, 7N - 16W ~~sec 19 7N~~ 15W

Oil wells producing ~~[illegible]~~ 360 feet
disc 1950

South Gotebo

NENENE sec 26

Oil at 240' to 430

also sec. 29
also 34 S. Gotebo

Found in 1950's

6N-14W
7N-14W
Kiowa Co.

Shot holes with small amts of oil sec. 32, 33, 7N-14W
9-11, 13-15 6N-14W
60-100' deep

Confidential

United Geophysical Co report on Carnegie Mt View area 1947

Sec. 5, T5N,R18E. Name of Occurrence.

(1) Location. Latimer County. Sec. 5, T5N, R18E. This location uncertain but based on facts of description as below. W. of Wilburton.

Material Described. Seepage of gas as below.

Information Source. O.G.S.Bull. 40-II, J.A.Stone & C.L. Cooper p. 419.

General Geology. North of Choctaw Fault. On McAlester anticline.

Commercial Development. None, simply a surface manifestation of gas that is found in a near by well at various levels but particularly at 328'.

Miscellaneous. The occurrence is of interest only because of its alleged occurrence in a region productive of gas and in which where are some surface shows of asphalt. The authors, Stone and Cooper refer to development by a well that had shows of gas. This well was located in Sec. 7, T5N,R18E. and:

"There is a gas spring about ½ mile N. of the Hunt well (which was in SE NW¼ Sec. 7, T5N R18E.) which has been known since the early days. It has been used for heat in cooking by soldiers and campers since Civil War days."

NE 1/4 34 2N 25E
LeFlore

Jackfork ss - outcrop reported 14" thick for distance of about 5 feet.

Not on orig. Goodrich map.

Ham 1956 p. 11 Beach p. 55 (FS 476)

---

3 of Goodrich NW 1/4 21 3N - 25E
LeFlore County

Vein reported as 12' thick on side of steep hill of Jackfork ss.

Ham 1956 p. 11
Beach p. 55 (FS 53)

~~B+~~2 of Goodrich H. p. 78 Page Deposit
(S/2 sec. 24 T. 3N R. 26)
Location corrected by Ham in 6/1954
Correct → (NE 1/4 SE 1/4 23 3N-26 (Ham) using aerial photo + known sec. lines.

Impsonite
Mined. Jackford sandstone, dips 60°.
Veins 2-10.5' thick. Mined.

Taff Bull 380 p. 294 (Black Fork mt) Woodruff p. 14 - under.
Hutchison p. 78 Ham p. 10

Love Co. 7-6S-2E

S. Overbrook field
(N. Greenville)

SW SW SE SE 230-280 ~~271-281~~ Deese PP 2 BOPD. 8/1959

SW NW NW 540', 40' thick Dis 1956 Gardentire ~~#1 Hardy~~

SW SW SW NO 662' 35 BOPD 42° gr. TD 682

Most of Deese sds below 500 in Sec. 7.

On map ✓
on list ✓

Scout's year book ✓ ROR ✓

35-6S-2E
NW NW SW
Love Co

Neff et al 1 Wilson 1939
Penn sds 500-940' ~~$~~ @ 3012
in Springer DH + Deese
High gravity.
Staining only

Omit

Sec. 6, T6~~N~~S,R2E. Name of Occurrence. Sample No. 18 of Shelley (1929)

(1) (2) Location. Love County 3/4 Mi. SE of Overbrook. SW¼ Sec. 6, T6~~N~~S,R2E.

Information Source. 6, p. 62, 11, p. 11, 12, p. 162, A. 18, Table of Tests, p. 25, Sample No 18.

Material Described. Sand Asphalt in a Pennsylvanian S.S.

Shelley says Trinity (?)

General Geology. The sandstone is continuous with dip 65 Deg. S37W. Hutchison writes: "The residuum of an old

petroleum deposit, occurs along the bedding plane of the sandstone." Outcrop is 40 x 50 yds.

Commercial Development. Quarry formerly operated; abandoned about 1914. Steam power hoisted and loaded on a spur from the R.R. at the W. Outcrop 40 yds wide by 50 yds long.

Miscellaneous. Hutchison, (6,p. 62) lists this as Loc. #1, Table of Tests, 1, p. 25 shows, Bitumen 8.91%

Ben Belt's field notes of D.G.S. (1909) discusses a Loc. which is probably (2) on the reverse, thus:

SW SE Sec. 6, T6S,R2E. Asphalt fine grained

Sample No. 18 of Shelley 2

occurrence in the Glenn. A broad steep, anticline in the quarry monocline. Dip 65 Deg. S37W. Cross bedding. Impregnation along the bedding planes of fine grained SS. Caprock is shale. The outcrop is 40 x 150 Yds. on the hill. Hillside method of quarrying used.

Location SE NW 7, T6S,R2E.
Source of information, C.W. Tomlinson, O.G.S. Bull 46, Map, 1931. pl XIX (1929)

Old sand asphalt quarry in the Deese Fm.

Sec. 18, T6S, R2E.

(4)

Name of Occurrence. Sample No. 20 of Shelley.

Location. NW NE$\frac{1}{4}$ Sec. 18, T6S,R2E. Love County.

Information Source. 18, Table of Tests, p. 25 Sample No. 20. Should obtain later information.

Material Described.

General Geology. Found in the Hoxbar (?)

Commercial Development.

Miscellaneous. Shelley (1929) 18, Table of Tests, p. 25 shows this Sample No. 20, Bitumen 6.87%. "Hoxbar?"

Sec. 27, T6S,R2E.

<u>Name of Occurrence</u>. N. of Hickory Creek. Land of H. C. Draughan.

(5) (6)

<u>Location</u>. N.W. corner NE. Sec. 27, T6S,R2E. Love County.

<u>Information Source</u>. 6, p. 62; 11, p. 11, 12, p. 162,A. 18, Table Tests, p. 25, Sample No 19.

<u>Material Described</u>. Sand Asphalt.

<u>General Geology</u>. The deposit parallels the outcrop of the Glenn at the Cretaceous contact a few miles to the NW. and in strike with that in Sec. 26, T5S,R1E. and Overbrook. See old oil bed.

<u>Commercial Development</u>. Two prospects pits 100' apart 10' to 20' deep.

<u>Miscellaneous</u>. A second location is same Sec. but to the S. of Hickory Creek. It consists of an oil spring surrounded by sand asphalt. It is reported by Pierce Larkin. The occurrence is near the base of the Trinity sand (Cretaceous) and is the result of oil seepage from below.

Hutchison 6, p. 62-63, lists as Loc. #2.

It is believed that the occurrence just named is the same as that given by Shelley (1929) in Table of tests, 18, P. 25 Sample No, 19. The geologic formation is there described as Trinity and bitumen, 12,18%.

See Field notes O.G.S.2/8/44 two samples at Loc. 2.

Love County. (6) Dup

From field notes Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field sheet 55. SW¼ and SE SW Sec. 27, T6S,R2E. No doubt this is same as is covered by Shelley's Sample No. 19 for which see file. Shelley Sample Trinity NE SW 27-6 -2 = 12.18% Bit.

This property was operated about 20 years ago. Thickness 3 to 5' to 10 to 12', covering from 10 to 50 acres. 2 miles from Sta Fe. R'y.

Lab Test:

Sample	Bitumen	Penetration	Residue	Minerals	Use.
S-1a	8.17%	Low	Asph,Sd.	Qtz. Sd. 89.97%	Road topping if blended.

214

S-1b	5.75%	Low	Asph Sd. 94.24%Qtz	Asph Oil Qtz	Road topping if blended.

This occurrence is duly recorded on card which covers "Land of H.C.Draughan".

Sec. 35, T6S,R2E.

(7)

Name of Occurrence. Sample No. 21, of Shelley (1929)
Love County

Location. NE$\frac{1}{4}$ SE$\frac{1}{4}$ Sec. 35, T6S,R2E. Three exposures, in the Sec. Hutchison, 6, p. 63, Loc #3.

Information Source. Reported by Pierce Larkin to Hutchison 6, p. 63. 18, Table Test, p. 25.

Material Described. Oil springs found in an indurated member of the Trinity sandstone. Some sulphur water.

General Geology. Shelley, 18, p. 25, Sample No. 21 rates as Trinity, bitumen 5.65%.

Commercial Development.

Miscellaneous. Viscous asphaltic material surrounds the seepages. Oklahoma Geological Survey Bull. 19, 1917. in discussing Trinity sand Occurrences in Love Co., says there is very little evidence in the Trinity Sands of sufficient organic matter to produce any appreciable amounts of bituminous substances.

Further Bull. 19, p. 211-212 discusses Cretaceous shows of bitumen:

"On the Oklahoma side (as compared with North Tex) numerous occurrences of asphalt have been reported but upon examination were not found to contain any asphalt, the black color of the rocks being due to the highly oxidised state of the contained iron. In some localities for example, about the Wheeler field and the segregated land in the vicinity of Asphaltum, the surface S.S. which is saturated with asphalt is very similar in appearance to certain parts of the pack sands in the Trinity sand moreover, and it is believed that at least a remnant covering of these sands extends to this distance to the northward. The origin of the asphalt cannot be definitely determined, but it is very likely that the oils giving rise to the deposition have worked up from the rocks older than the Cretaceous."

Sec. 9,16, T6S,R3E

Omitted 89

Name of Occurrence. American Paraffin Co. Lease.

Location. Love County. Part of S½ Sec. 9 and N½ Sec. 16, T6S,R3E.

Information Source. 6, p. 63-64.

Material Described. Hutchison, 6, p. 64, "At various places over the area described deposits of what seem to be impure paraffin or mineral wax occur".

General Geology. The material is found in the Trinity.

Commercial Development. No information. To be obtained

later.

Miscellaneous. Hutchison gives no definite data, which should be investigated in detail.

Sec. 32, T6S,R3E.

(8)

Name of Occurrence. Reported about 1 mile N. of mouth Pumpkin Creek. This must be verified.

Location. Love County. SE¼ Sec. 32, T6S,R3E. (??)

Information Source. 6, p. 63 Indefinite.

Material Described. Asphaltic

General Geology. Probably from Pennsylvanian Glenn, upturned.

Commercial Development. Not developed Verify the "mouth of Pumpkin Creek"

~~Miscellaneous.~~

Sec. 1, T7S,R2E.

(9)

Name of Occurrence. Reported by Pierce Larkin.

Location. Love County. Occurrences (2) in S½ Sec. 1, T7S,R2E. 5 Mi. NE of Marietta.

Information Source. 6, p. 63; 11, p 11; 12, p. 162.

Material Described. Oil Spring with asphaltic material surrounding.

General Geology. in an indurated member of Trinity S.S. Dip is to S.E. at low angle.

Commercial Development. Undeveloped.

From field notes Oklahoma Geological Survey. Copy furnished the present compiler for his personal inspection.
See card covering samples 32-1 to 32-6 in T7S,R2E.
Field Sheet 32-5 Lab Test:

Sample	Bitumen	Penetration	Residue	Minerals	Use.
32-5	7.20%	Very low	Qtz Sd.	Asph Qtz	Road topping

32-5 in NE NE Sec. 1-7s-r2E.

Sec. 4, T7S,R3E
Sec. 5, T7S,R3E

Name of Occurrence. Powder Creek. Reported by Pierce Larkin Three Occurrences.

(11) (12) (13)

Location. Love County. (1) NW.SE. Sec. 4 (2) SW NE Sec. 4, T7S,R3E. (3) SE¼SE¼ Sec. 5, T7S,R3E.

Information Source. 6, p. 63 Hutchison lists as Loc. #5.

Material Described. (1) Natural Oil Spring. (2) Light oil in domestic water well. (3) Same. Trinity Sand. Little asphaltic material collection, Apparently the oil may be of paraffin base.

Commercial Development. Not developed.

Love County

From Field notes of Oklahoma Geological Survey. Copy furnsihed the present compiler 2/8/44 for his personal inspection.
Field Sheet 32 with 6 samples. Of these No. 1, 2, 3, & 6 are in S½ Sec. 36, T7S,R2E. These, with 32-5 which is located in Sec. 1-8S-2E, are intermittent outcrops of about 12" thickness, all of the same stratum. No estimate of the quantity.
Field sheet 32.

Sample	Bitumen	Penetration	Residue	Minerals	Use.
32-2	11.12%	Very Low	Qtz Sd.	Asphalt Qtz.	Road toppng Paint Roofing

32-3	11.99%	Very Low	Qtz Sd.	Qtz Asph	Road topping Paint Roofing
32-6	3.48%	Very Low	Qtz Sd.	Qtz Asph	Road topping

See Sec. 1, 8S, 2E.

Sec. 32, T4S,R5E. Name of Occurrence.

(1) Location. Marshall County, SW¼ Sec. 32, T4S,R5E. 2 Mi. W. of Randolph.

Information Source. 6, p. 65; 11, p. 11; 12, p. 162. 18, p. 25.

Material Described. Low grade sand asphalt. Contains perhaps 2% asphaltic. Low grade asphaltic S.S. & Sh.

General Geology. A lentil in Trinity S.S. resting on a friable sandy shale grading down into thin S.S. The exposure is 300' long. 25' overburden of Goodland Ls.

Commercial Development. Not operated and probably not practicable.

Miscellaneous. Hutchison, 6, p. 65, lists as Loc. #2. Shelley (1929) reference in Table, p.25 probably to this Sample No. 67, in Trinity, with Bitumen, 2.67%.

Sec. 34, T4S,R5E.

(2)

Name of Occurrence. Oil Spring North of Madill.

Location. Marshall County. SE. 34, T4S,R5E. Hutchison lists as Loc. #1.

Information Source. 6, p. 64. 11,

Material Described. Heavy oil, seepage. Very slight flow by drops.

General Geology. Seepage is from lentil S.S. near top of the Trinity fm. about 10' below the Goodland Ls. Structure is monoclinal with dip about 1 Deg. S40E.

Commercial Development. In the past 3 small pits were dug at foot of the bluff, these not highly productive.

Miscellaneous. Bullard & Redfield, O.G.S. Bull. 40-00, p. 523 quote U.S.G.S. Bull. 736 at length. The presence of oil seeps near Madill led to prospecting with the drill and finally in March 1909 to the discovery of a small pool of oil 1½ miles E. of town." Discovery well Mal-Millan Oil Co. in SW¼ Sec. 25, T5S,R5E. See O.G.S Bull 39.

Sec. 17, T5S,R5E.

(3)

Name of Occurrence.

Location. Marshall County. NW¼ Sec. 17, T5S,R5E. 2 Miles E. of Oakland.

Lot Sheet 3-1 gives SL 4 SE 7

Information Source. 6, p. 66; 11, p. 12; 12, p. 162.

Material Described. Lenticular mass of S.S. containing asphaltic material. The ledge 12" thick 400 Yds. (Lentil

General Geology. The deposit is in the Trinity Fm. Bitumen 1½% to 5% along bedding planes.

Commercial Development. Has not been prospected.

Worthy.

Miscellaneous. Hutchison (6, p. 66) lists as Loc. # 5.

Sec. 20, T5S,R5E.

(4)

Name of Occurrence. Sample No. 64, of 18, p. 25.

Location. Marshall County. NE NW¼ Se 20, T5S,R5E.

General Geology. In Trinity S.S.

Information Source. Shelley, 18, p. 25, Table of tests, Sample #64.

Commercial Development.

Miscellaneous. Sample No. 64 of 18, P. 25 Table shows in Trinity S.S. with bitumen, 2.75%.

Sec. 26, T5S,R5E.

(5)

Name of Occurrence.

Location. Marshall County. SW¼ Sec. 26, T5S,R5E. 1½ Mil ~~NW~~ E of Madill.

Information Source. 6, p. 65; 11, p. 12; 12, p. 162.

Material Described. Rock asphalt along E. bank of Glasses Creek.

General Geology. Thickness of 4' of sand asphalt exposed several hundred feet. In a lentil near top of the Trinity sand. Overburden is Goodland Ls. Structure monoclinal Dip to S.E.

Commercial Development. Never has been worked, contains 4%-5%asphalt.

Miscellaneous.

Sec. 27, T5S,R5E.

(6) Omitted

Name of Occurrence.

Location. Marshall County. In cotton seed oil mill, Madill, SW¼ Sec. 27, T5S,R5E.

Information Source. 6, p. 67.

Material Described. Reported personally well sample, unconsolidated asphalt saturated SS.

General Geology. In upper part of the Trinity sand (Cretaceous) encountered in drilling the well. Depth not stated except "near the surface."

Commercial Development. Not Developed.

Miscellaneous.

Sec. 29, T5S,R5E.

(7)

Name of Occurrence. In S.W. block of Oakland Townsite. Hutchison lists as Loc. # 4.

Location. Marshall County. NE$\frac{1}{4}$ Sec. 29, T5S,R5E. 3 Mi. W. of Madill.

Information Source. 6, p. 66; 11, p. 12; 12, p. 162.

Material Described. Sand asphalt lentil 8'-10' thick. Locally contains 4%-5% asphaltic.

General Geology. In Trinity Sand. In some places "Dead Asphalt". Structure monoclinal dipping S.E. at ~~angles.~~

at low angles. Bituminous matter along bedding.

Commercial Development. Not operated.

Miscellaneous.

16-6S-4E
SWSW
Marshall Co.

Field Sheet 55 - 2 samples

Outcrop in Trinity ss in deep gully Sand is 10' thick + overlies clays.

Bitumen 10.26%

228

Sec. 26, T7S,R5E.

(8)

Name of Occurrence. Sample No. 70 of Shelley (1929)

Location. Marshall County. NW¼ sec. 26, T7S,R5E. on S. side of Sand Creek. 18 Mi. S. of Madill.

Information Source. 6, p. 67; 11, p. 12; 12, p. 162. 18, p. 25.

Material Described. 2 small lenticular deposits at different levels in sandstone bluff.

General Geology. Impregnation at about 100' below the top of the Trinity.

Commercial Development. Not developed but probably small deposits as shown by pinching out of lenticular masses. Shelley (1929) table of tests, p. 25 shows, in Trinity;

Miscellaneous. Bitumen content 4.56%.

23
24-25, 7S-5E
30-31, 7S-6E
1 8S-5E
6 8S-6E

Isom Springs
(formerly Enos)

Oil disc 1931. [illegible] Depth: 350-550'
Cretaceous sand 27° gravity

Prod 1/1/62 840,000 bbls

(36) p. 27 (34) p. 235

224

5S-5E
5S-6E

Madill (Bilboand "arbuckle" sand) oil field.

13, 14, 24, 25 T 5S R5E
+ 30 ~~7~~5S - R6E

Depth 420-460 th 1½-20 feet

Bullard + Redfield OGS 40-00 p. 22-25
Hopkins, Powers + Robinson 1922, USGS 736

23-7S-5E
NWNE
Marshall Co

Cref #1 Naff
TD in Penn at 7098
after testing free oil thru
Penn Some of younger ss
were slightly asphaltic, as
well as numerous stains of
oil

Cert/stanley

NE flank of Preston anticline
SE Ardmore basin

9-8S-5E
NESENW
Marshall Co

Shell Oil Co. Stout #5-57
SS 2716-50, Deese
1958 - 3 BO/12 hrs @ 2716-50
As of Nov. 1962 produced 698 BO

3-7S-6E
parts of sec.
Woodville prospect
Marshall Co.

Cretaceous on Arx tar
Production from sd @ 800', 20'
thick, gravity 19.6° 320 acres

CC logs

Mayes County (1)

At various points in Mayes County rumors and traditions have existed that have led to beliefs in regard to asphaltic occurrences. These are mainly conjectural and not proven. They are here quoted because of the remote possibility of their (in part) possible relation to tar and asphalt.

In Secs. 25/36, T21N,R20E. at Grand Saline, East of the Neosho River. Muriel H. Wright, Chronicles of Oklahoma, Vol. 4, 1926, ;. 322, relates the story that Lewis Ross, Chief of the Cherokees, was making salt. He sank a water well (shallow) and struck a "vein of oil estimated at 10 bbls.per day which rpoduced for a long time." This story had wide prevalence as proving that oil was produced locally in 1859 at the time of the eastern Drake

oil discovery.

It was further stated that this old well which still produces salt water, from time to time ejected blobs of oil. Mr. Frederic B. Bush of the Sinclair Oil Co. states that he tried to verify this and saw not any oil at all upon a visit to the well or salt area.

Another locality noted by James H. Gardner is at the Old Union Mission in Secs. 17/20 (?) T19N, R19E. salt water and gas that has issued for a very great no. of years. This, and the shallow gas well in Sec. 31, T20N,R19E, do not necessarily have connection with asphalt. However there is a suggestive indirect connection.

19-19N-18E
Mayes Co.

Collin Oil Co #1 Mullins

1963 new field discover - oil

at 666 feet in Tyner ss.

~~[illegible]~~ Befm 500'

30-23N-20E
Mayes Co.

Oil seep + asphaltic residue in
Hindsmile quarry. Miss. ls.

OGS Bull 77, p101

1-23N-19E
Center Sec.
Mayes Co

Oil-impregnated rock exposed in
a trench side of upper Miss. ls.

Mobil 11/63

16-23N-18E
SENW NW

SENW NW 16-23N-18E Mayes Co.

Oilsample from well.

CClog in NWNWNW 16 to TD 474

Compled 3/4 bbl oil from Miss lime.

Informat fm.

Mr. J. Carselowy, Adair, Okla - Mobil.

27-22N-19E
Mayes Co

Hole drilled for water bottomed in Miss - Oil is to be found in this old hole

Mobil 11/63

21-22N-19E
NESW Well

Well drilled for water, bottomed in Mayes Co McAlester fm. Oil present in this old hole

Mobil 11/63

Limestone (oil-impregnated) ~~Adair Co.~~ Mayes Co
Quarry.

Fieldsheet loc.
NESWSE added 1963
Sec 24-23N-19E

Hindsville (Chester, Miss.)

Quarry face 3 miles NE of Adair

* 0-5 feet, soil + weathered ls

4' silty ls + calc. siltstone

8.5 Ls. crinoidal massive, dk gy cse grnd. 5 seeps on quarry face.
heavily saturated with oil

12' exposed. Ls, silty lt gy, f.grnd, massive

Sample from upper 3' oil sat contained 2.84% hydrocarbon by weight. Letter from J.H. Carseloway

*Stoever, E.C. Jr. 1956, O.G. Notes vol. 16, p. 139 over

See "The Pryor Daily Times
vol 17-163
Pryor Okla 9-20-36

Letter from J. H. Carseloway
10/~~24~~/1956

in asphalt, seeps file.

McCurtain Co. 22-6S-21E
SE 1/4

Asphaltic sand in Antlers -
Manley thesis p 28, 31

? 22

Sec. 28, T6S,R21E. Name of Occurrence. Sample N. of Shelley (1929).

(1) this is probably Davis locality in SE 1/4 22

Location. McCurtain County. Probably SE.SE¼ Sec. 28, T6S,R21E. One-half mile E. of Valliant.

Information Source. 18, P. 12 & 25.

Material Described. Horizontal calcareous. asphaltic sand.

General Geology. In Trinity S.S. Lower Cretaceous. The thickness is undetermined. Very thick. The bitumen content is 12.35%.

Commercial Development. The deposit was mined several years ago but suspended because of difficulty in crushing.the material.

Sec. 20, T7S,R24E. Name of Occurrence.

(3) SE/4 See Davis OGS Bull 86, map.

Location. McCurtain County. Probably in NE Sec. 20, T7S,R24E. 3 Mi. N. of Idabel. To be verified.

Information Source. 6, p. 76. Location on S. bank of Little River. 11,p. 14; 12, p. 163.

Material Described. Sand Asphalt in ledge 25' thick for ½ mile along the stream. Large percent Asphalt.
See OGS M.R. 23, p. 14

General Geology. The occurrence is in Trinity sand.

Commercial Development. Offers favorable prospect near transportation.

__Miscellaneous__. Shelley (1929) 18, p. 25 Table of tests, Sample #95; in the Trinity, with bitumen 10.39%.

Northeast Idabel oil field

NW SW NW 16, 7S, 24E

Lone Star Prod. Co. B-1 Diercks
Completed 3,22-59, Pumped 4 bbls oil per hour
Perfor 618-623

McWood Corp. developing flood.

McCurtain Co, Okla

McWood Corporation, Abilene, Texas

a pipeline gathering company in area
Wells drilled by 100 | C & L type Bldg.
W using a solvent type flushing process

at area north of Idabel
where Lone Star got heavy oil

231

McCurtain County.

C.W. Honess. Oklahoma Geological Survey Bull. 40, p. 97, 1930.

"Asphaltite has been dug and blasted from a pit at Valliant (Sec. 29??-T6S-R21E.) only very recently."

See Dome, 1960, OGS Bull 86, p. 14

The author refers to other occurrences in this county at Idabel, and in general to the occurrences mined in Atoka county.

P. 98. These are of Honess's second class, i.e. sand or S.S. saturated with petroleum, belonging to the Trinity, an the oil has come up from below accumulating below the hard Ls. (Goodland). It is not indigenous to the Trinity but has come up from the older (Paleozoic) rocks.

---

(1)

SE 1/4 22, T6S, R21E
McCurtain Co

Dome 1960 OGS Bull 86 p. 14

* asphaltic ss (Paluxy) about 10 feet thick in an area of about 1/2 acre overlain by 5' of ... in turn by Goodland
Also in Manly's thesis p. 28, 31

* Davis OGS M.R. 23 p. 13

** asphaltic sand in upper part of Paluxy well exposed over area of several acres Prospect

---

West Idabel
Oil field

McCurtain Co

W.D Seay ...
J.H. Wilson 1 Harmon.

SESENE 5-8S-23E 325'

28.6° gravity Ppd. 5 BO/12 hrs

Paluxy sand, or 25 bbls per day gravity 28.6

NWSWNW Sec 4-8S-23' oil in upper part of Paluxy Sealy Oil Co
1 MT Smith

OGS M.R. 23 p. 13

SESWSESE 29-7S-23E

Gray-Ware #1 Brutt 1-3-53 Depth 344
Good oil show in upper Paluxy

HF Wilcox SWSWSE 30-7S-23E
Show of oil at 300'

Davis OGS M.R 23, p.15

N. Stem ~~Thorne~~ Field

FIELD COUNTY—OKLA. 16-7S-24E
S. Holly Creek McCurtain 7-27-64
OPERATOR: McWood Corporation
ADDRESS: 1001 C & L Life Building
Houston, Texas
WELL NO.: 4 Dierks Trustee
LOCATION: NW SW NW 16-7S-24E
FOOTAGE: 790' N/S 660' E/W
PROPOSED DEPTH: 650' STARTING DATE: 7-24-64
TYPE OF EQUIPMENT TO BE USED: Rotary
CONTRACTOR: (Dierks Sand)
ADDRESS:

RESEARCH OIL REPORTS
904 Commerce Exchange Bldg., Oklahoma City, Oklahoma

Murray County

J.A.Taff, "Description of the Unleased Segregated Asphalt Lands in the Chickasaw Nation, Indian Territory" U.S. Dep't of Int. Circ. 6, 1904.

In description of Tract #3, states, A short distance from the center of Tract 3, in a bluff of Rock Creek is a fine compact, unconsolidated sand filled with bitumen, the thickness 20' exposed. Above it an impregnated conglomerate lying unconformably on the S.S.

Nearly 1 mile to E. and near the S. Side of Sec. 15 and the NE. corner of 21, on lease of the Rock Creek Nat. Asph. Co. thick deposits of asphalt sands found beneath the Ls. conglomerate. The asphalt sand on Rock Creek was prospected by extracting bitumen in open bottles with yield of 10% to 12%

Murray County

Thirty-sixth Ann. Rep't Oklahoma Dep't of Mines and Minerals (1943)

P. 29. "Southern Rock and Asphalt Company, R.D. Ross, Manager, Sulphur, Oklahoma.

This mine is located four miles southwest of Sulphur, Oklahoma, on the Santa Fe Railroad. It is equipped and quarried. Has one steam shovel, 6 gasoline shovels, 2 power drills, 5 air compressors, 6 jack hammers (air) and 25 trucks. Last inspection this mine was in fair condition.

Number of men employed 150
Number of tons per day 1000

P. 30. "Asphalt Production. Southern Rook Asphalt Company, Sulphur.

Open pit, produces 286, 908 tons with 2000 lbs. in one ton. Days worked, 214; total number employed, 150 for the year. The asphalt is used principally for road materials and air ports. The report no fatalities and 44 non-fatal accidents.

Explosives used, 92,300 lbs."

(The above for any comparison with more exact statistics from other sources which are supposed to be in hands of the U.S.G.S. party, but not in these index cards.)

5-1N-2E
SWSWNE and
SWSENW.
Murray Co

Penn. sandstone @ depths 2140'-69
in 2 wells.

Kingery #1 Deran
30 BPD, 21° gr.

Kingery #1 Kerner
46 BO + 5 BSW/24 hrs
Gravity 17°

234

#36

23, 24-1N-2E

Murray Co

NW Sulphur Field

Faulted on east, NE-SW Trending fold

excess of closure is 30' on basal O.C.

in NE sec 31 + NW sec. 24 60 acres

7 wells - McLish Basal Oil Creek sds

Basal Oil Creek is at 1500'

well net thickness 30'

gravity is 16°

#6

Sec. 20; and 29;
T 1 N, R 4 E.

Name of Occurrence. Hickory Deposit.

Location. 4 Mi. NE of Sulphur. Murray County. SW¼ Sec. 20 and NE¼ Sec. 29; both in T1N,R4E.

Information Source. 2, p. 305; 6. p. 61; 11, p. 11.

Material Described. Rich Sand Asphalt. Medium grained S.S. cemented with bitumen. Estimated per centage 10-15% bituminous.

General Geology. Eldridge P. 305, correlates with the Dixon S.S. of the Buckhorn District, or Simpson Fm.

Commercial Development. The occurrence is located 1½ mi. S. and 2 Mi. W. of Hickory station. It has been prospected by stripping an area about 20 by 30' in the Sec. line, but has never been exploited on a commercial basis. The deposit is believed to be 10' or 15' (Hutchison, 1910)

~~#6~~
Sec. 21, T1N,R4E.

(1)

Name of Occurrence. Sample No. 41 of 18, p. 25.

Location. Murray County. ~~NE~~ #5 of NW¼ Sec. 28 & SE. SW¼ sec. 21, T1N,R4E.

Information Source. 18, p. 25, Test Sample No. 41.

Material Described.

General Geology. Sample No. 41 shows in the Simpson formation Bitumen content, 10.90%.

Commercial Development. See above test

Miscellaneous.

Murray County (2)

Notes given by J.M. Gorman, U.S.G.S. Sulphur, 4/18/44.

Loc. SE SW Sec. 21, T1N,R4E. A small outcrop of high grade (10%) fine grained sand asphalt, found ind ditch at the N. side of the road. The Southern Rock Asphalt Co. has a prospect pit for about ¼ sec. N.W., 4 to 5' stripping 2-3' asphalt then unimpregnated sand.
Some resembling Burdseye Ls. mapped as Oil Creek.

✓

#35

21 - 2N - 2E
C W/2
Murray Co

Moore #1 Cozad
Penn ss 830-837, 871-875
19° gravity
1953 IP 4 BOPD

-6° to 22° API (heavy oil)

25° API

236

#8

Sec. 11, T1S,R2E. **Name of Occurrence.** Deposit near Davis. ~~Murray County.~~

(6) **Location.** Sec. 11, T1S,R2E. S.E. of Davis.

Information Source. Hutchison, p. 61 has a very vague reference to a report. No exact location in Sec. 11.

Material Described. Sand Asphalt.

General Geology. C

Commercial Development. None as of 1909.

Miscellaneous.

#10

Sec. 21, T1S.R2E. **Name of Occurrence.** In Washita Canyon District. Sample No. 59 of Shelley.

(7) **Location.** Murray County. Cen. Sec. 21, T1S,R2E. 4½ Mi. N.W. of Dougherty ½ Mi. E. of G.C.&F.F.R'y.

Information Source. 6, p. 60; 11, p. 10; 18, p. 25. Table. Gorman 1944, Oil + Gas Inv. Prel. map 15

Material Described. Limestone saturated with bitumen Rock crushed and recemented.

General Geology. The opening is in the Viola Ls. on the N.E. slope of anticline. The zone of imprgnation is of

---

large area extending N.W. near to the River. No data as to saturation.

Commercial Development. Location of the prospect convenient for shipping. Quantity unlimited but quality yet to be proven as of 1909 Hutchison.

Miscellaneous. Sample No. 59 of Shelley (1929) shows, in Viola, with bitumen content, 0.62%

#26

Sec. 25, T1S,R2E.

(8)

Name of Occurrence. Eldridge's (1901) Number 4 Quarry of Brunswick District . Included in Dougherty asphalt area. Gorman 1944

Location. Murray County. NE SW¼ Sec. 25, T1S,R2E.

Information Source. 2, p. 210-211; 6, p. 59; Woodruff, 1934. 18, p. 11 & 25.

General Geology. See below. Shelley (1929) Viola Ls.

Material Described. See below.

Commercial Development. See below.

Miscellaneous. The only important quarry on the segregate land in this district; always the mian quarry. This has been operated by the Downard Asphalt Co. to supply line asphalt for paving, Eldridge, (pp. 210-211) is quoted by Hutchison(6, p. 59) thus:

"This is advantageously opened on what promises to be a productive body of rock in the block of No. 4 Ordovician Ls. in the N.E. side of fault C. The Ls has the same features of composition, texture, and impregnation as those described for it at the No. 4 quarry of the Buckhorn district. The earthy, granular, and crystalline textures are all repeated; the barren calcite bodies are present, in equal contrast with the general mass of the rock the calcareous mud is all readily identified in one locality as in the other; and each

Eldridge's No. 4 2

variety of rock in texture shows the same difference in the degree of impregnation---A feature, too, conspicuously in certain portions of the Brunswick pit, is the filling of fracture cracks with pure bitumen, derived from the main body of the rock by infiltration. --- The possibilities of an ecomomic way must remain unknown unless the drill be resorted to.

The No. 4 Brunswick quarry is about 1 Mi. N. of the plant to which product is hauled, for conversion into mastic or other manufactured product, or beyond to the R.R. at Dougherty between 4 and 5 Miles.

Shelley (1929) 18, p. 11, describes:

"Sample 1. This sample is from Western

Paving Co's 'Rock Mine' about 1 mile N.E. of Dougherty. The quarry now (1929) is in operation: a 90' face of Ls. is quarried. The quarry is gravity drained. The material is crushed and mixed with sand asphalt for paving. Bitumen content of the Ls. is 4.25%."

Shelley (just quoted) gives the location for Sample No. 57 (1) as the SE¼ of the section. This is probably correct as against that given. The sample shows, in Viola, with bitumen content 4.25%.

#"

Sec.25, T1S.,R2E. Name of Occurrence. Brunswick District of Eldridge, 1901

(12) Location. "No. 1 Quarry" in Murray County, S.W. NE. ¼ Sec. 25, T1S,R2E.

Information Source. 6, p. 58; Eldridge; Woodruff.

Material Described. See Eldridge, p. 309.

General Geology. See below.

Commercial Development. It has never been of commercial importance as of 1909.

Miscellaneous. Following from Eldridge (1901):

"This is a mere prospect in a limestone outcropping in the banks of a dry channel at the E. base of West Ridge. The strike is locally N-S; the dip 20 Deg. E. Petrographically the limestone consists of (a(an ordinary granular or finley crystalline rock, impregnated with bitumen and looking at times as rich as the average No. 4 Ordovidian limestone: (b) a calcite variety, also impregnated with bitumen, but not always in sufficient quantity to render the rock of value; (c) white chert barren except for the seams into which the pure asphalt was forced at the time that, or after the general deposit became impregnated. Stratigraphically the bed as exposed is divisible into two layers, an upper of 6' and a lower of 5 or 4' (describes furthe lighographic details) The upper division is more even n texture and in impregnation and though calcitic, is wanting in chert. It is not to be considered a high-grade rock, although decidedly higher than the lower one, which in fact is worthless. The lower half of the upper division is also the richer. The rock as exposed in the bluff has been greatly fractured, especially the chert which in instances looks as if it had been shot through the Ls., in angular fragments, imparting to it a brecciated appearance. Shales immediately overlie the bituminous Ls, carrying in their mass, especially just above this Ls other thin crystalline yellow Ls. Green clays underlie the bituminous Ls. lower down the gulch.

#24

Sec. 26, T1S,R2E. **Name of Occurrence.** Brunswick District.

(10) (11) **Location.** 4 Mi. NE. of Dougherty on Rock Creek, known as #2 Sand Quarry probably in SE NE$\frac{1}{4}$ Sec. 26. T1S,R2E. and #3 Sand Quarry in NW. SW$\frac{1}{4}$ Sec. 25, T1s,R2E. Murray County.

Information Source. 6, p. 58, 7, p 11.

General Geology. Follows #2 Sand Quarry. Conglomerate horizontal.

Material Described. At #2 Sand Quarry. Subangular grains of sand cemented by solid asphalt pitch, used to furnish the solid pitch for paving mixtures. Test:

Locality	Dougherty
Material	Rock Asphalt
Bitumen sol. in CS2	7.80%
Character of bitumen-Semi solid sticky, ductile	
Analysis Spec. Grav.	1.017
Penetration 100 g. sec. 25 C.	61
Loss at 163 Deg. C 5 Hrs.	3.48%
Consistency of residue	29
Bitumen insol. in 86B Naphtha	22.44%
Fixed Carbon	10.36
Mineral matter.	4.93.

2A

Cementing Value Excellent
Would make a good road building material.

No. 2 sand quarry on Rock Creek 1 mile E. of the above. Developed by pit 35' deep on bank of the creek, explored by drill to 90'. Deposit horizontal with 10' max. overburden. Sand cemented by solid asphalt pitch. Shipped to Dougherty and used for solid pitch for paving mixtures.

Following Test:

Locality	Dougherty
Material	Rock Asphalt
Bitumen soluble in CS2	7.89%
Character of bitumen; Semi-solid ductile	

Sp. Gr. 25 C/ 25 C	1.017
Penetration 100 g 5 sec. 25 C.	61.
Loss at 163 C. 5 Hrs.	3.48%
~~Consistency of residue~~ penetration as above	29
Bitumen insol. in 86 B. paraffin maphtha	22.44
Fixed carbon	10.36
Mineral Matter	4.93

Mineral aggregate, Retained 50, 0.2%; 80, 9.8; 100, 14.3% 200, 45%; Passing 200, 30.6%. Mineral aggregate very fine sand with rounded grains.

Brunswick District 2.
#2B

Above referred to #2 Quarry. The following relates to #3 Sand Quarry in NW. SW¼ Sec. 25.

<u>Location</u>. Along Rock Creek.

<u>Information Source</u>. 6, p. 58; 7, p. 12.

<u>General Geology</u>. The horizontal layer, 15' thick, Area not known in 1913. Angular to subanglar grains of sand cemented by soft maltha

<u>Commercial Development</u>. Hauled to Dougherty for shipment.

Snider 2 ~~#20~~ Murrary County

No. 3 Sand Quarry along Rock Creek. Layer 15' thick horizontal Overburden Max. 20'. Area not known. Sand cemented loosely with soft maltha. Material used as flux for harder pitches. Following Test:

Locality	Dougherty
Material	Rock Asphalt
Bitumen soluble in CS2	6.77
Character of bitumen	Sticky viscous fluid.
Bitumen: SP. Gr.	0.991
Loss at 163 C 5 Hrs.	6, 13%
Consistency of residue - Too soft for penetraction	
Bitumen insol. in 86 B. naphtah	11.15%
Fixed carbon.	6.95%

Mineral matter .81
Grading mineral aggregate: Retained 20 mesh, 0.00; 50, 1.3%; 80, 40.0%; 100, 39.5%; 200, 18.6%; Passed ~~20~~ 200, 0.6%

~~#20~~

Sec. 25, T1S,R2E.

(10)

Name of Occurrence. "Brunswick District" of Eldridge (1901). Quarry No. 2 and (Quarry No. #.3 (in Dougherty asphalt area, Cornm

Location. Murray County. Hutchinson's locs. #2 two parts; (1) Quarry 2, SE. NE. Sec. 26. (2) Quarry #3, NW. SW Sec. 25, T1S,R2E.

Information Source. Eldridge, 1901, 6, p. 58; Woodruff, 1934.

Material Described. Limestone impregnated.

General Geology. See Eldridge description of Quarry #1 in Sec. 26, T1S,R2E. Productive rock is Viloa Ls.

__Commercial Development__. "The most northwesterly of these is hardly more than a prospect hole but considerable tonnage has been removed from the latterl" (Hutchison 1910) The asphaltic content greater than in Quarry #L of Sec. 25, T1S,R2E.

2 A - B

MURRAY COUNTY

L.C. Snider (7,p. 9-10) Discusses the Buckhorn District which Hutchison (6, p. 44) describes as including all occurrences S. of Sulphur and in T1S,R3E.; and the Brunswick District about 4 Miles N.E. of Dougherty.

Snider states the Buckhorn Dist. contains in 1913 about 20 quarries and prospects; the majority in Simpson Ordovician, some in the Viola. The Brunswick area in 1913 is smaller. Principal quarries are Brunswick Rock #2 and #3.

2A Quarry #2, Hutchison (6, p. 58) locates this in SE NE¼ Sec. 26, T1S,R2E. Quarry #3 according to Hutchison is in NW SW¼ Sec. 25, T1S,R2E.

See separate card.

35' high/ A surface outcrop of ¼ square mile. Carries 5 to 8% heavy maltha. Its value for paving as much on account of its mineral matter as on account of the bitumen."

Report of Test: (7, p. 11)

Locality	Murray County
Material	Bituminous limestone
Sp. Gr.	2.50
Wt. Cu. Ft.	156 Lbs.
Water absorbed per Cu. Ft.	0.86 Lbs.
% wear	4.2%
French Coef Wear	9.6%
Hardness	Not suitable
Toughness	" "

#Z A-B

Murray County

L.C.Snider (1913) p. 9 ff. (See duplicated statements in these cards,) describes theBrunswick District as "about 3 miles W. and a little S. of the Buckhorn district The area is much smaller than the Buckhorn and contains fewer deposits. (Buckhorn has 20 quarries) The principal quarries are the Brunswick Rock Nos. 2 and 3 sand quarries

The author discusses with analyses etc. He does not identify locations by section, township and range. Therefore this compiler will only here give information subject to later exact geographic spotting on the map.

The Brunswick rock is an asphaltic limestone about 4 miles N.E. of Dougherty" A large quarry with face 25 to

---

#35

27-1S-2E
Murray Co.

Dougherty anticline centered in sec 27 NW-SE, Bromide, McLish, Oil Creek & Sylvan exposed.
Truncated Bromide sands outcrop carry shows of oil in subsurface. One test drilled in NESENW 27-1S-2E

#12

Sec. 28, T1S,R2E. Name of Occurrence.

(13) Location. Murray County. Location. not definite. Eldridge p. 312 states according to Hutchison, "on W. side of Washita, about 7 or 8 Mi. S.W. of Davis and above thE Canyon. The nearest estimate is that the occurrence is in E½ Sec. 28, T1S,R2E to be verified later

Material Described. (1) a thin limestone with trace of asphaltic bitumen. A½" vein of asphalt seeped from surrounding rock. (2) An occurrence ¼ Mi. SW. of No. 1, is a slightly imprgnated S.S. in shales.

General Geology. The occurrences are both in Ls. and S.S. and ~~ahel of Ordovician.~~

Commercial Development. None.

#13-14

Murray County

F.A. Melton. Oklahoma Geological Survey Bull. 40 LL, 1930, p. 457.

"The well on Scott's (Vine's) Dome in the SW¼ Sec. 34, T1S,R2E. has produced asphalt since its completion in in 1919. The horizon is a S.S. about 430' below the top of the Simpson formation". On the basis of this the author recommends for further exploration.

See photostat well log of Ellis Price #1 which corresponds to the above as to location. This is probably the well that produced "asphalt". Another well T.D. 2505 reported asphalt at various depths.

This last dry well is Vinsonite #1 drilled in NW NE

SE Sec. 34, T1S,R2E. in March 26, 1939. It began in the Viola Ls. Reported shows and asphalt 995-1018; i quit in "asphalt" and there were various other reports.

#13 SW/4 34-1S-2E
Murray Co.

Scotts (Vines)

Along axis of Vines Dome, the Sylvan + Viola is cropout. Well on Vines Dome has produced asphalt 430 feet below top of Simpson.

Well Scott's Dome Oil Co. #1 Ellis Price

Developed by Mobil as in-situ project

Producing sand 1184-1269 accd to log p. 23

O. Bull. 40-LL, p. 21

#15

Sec. 3, T1S,R3E. Name of Occurrence.

(13) Location. Murray County. $2\frac{1}{2}$ Mi. N. of lime mine at Gilsonite Co. mill and about 1 Mi. S. of Sulphur. Possibly in Sec. 3, T1S,R3E.

Information Source. 6, p. 52.

Material Described. Sand Asphalt.

General Geology. In a lentil of the Franks Conglomerate of Pennsylvanian age.

Commercial Development. An old opening and quarry which in 1909, had apparently been worked out abandoned.

Miscellaneous. The inexact location should be verified

#16 Murray County (16)

Notes given by J.M. Gorman, U.S.G.S., Sulphur, 3/18/44

Loc. SE.NE.SW Sec. 11, T1S,R3E. Webb's land. A small prospect on the east side of the road. Sand about 4' thick impregnated along bedding planes. Calcareous S.S. N35E.

Another larger outcrop 150' to the S. in Birdseye Ls quarry. 4' of asphalt impregnated crossbedded calcareous S.S. conformable on top of Birdseye Ls. (McLish) Platy calcareous S.S. overlies the asphalt N40E. Stopped because of overburden (14') too many large calcareous boulders asphalt material too thin.

Murray County (16)

Notes given by J.M. Gorman U.S.G.S. Sulphur 3/18/44

E$\frac{1}{2}$ NW SW Sec. 11, T1S,R3E.

5 to 6 holes with show of asphalt at 30'. Could not get core out. One surface showing on the side of a hill and one in the basement of a house on the hill Apparently the deposit is shaly and spotted.

West across Scott's land are numerous sheets 4" to 5" thick.

#17-18 Murray County (17)

Notes given by J.M. Gorman. U.S.G.S. Sulphur, 4/18/44.

Loc. SE SE 14, T1S,R3E.

A prospect hole 100' N. of E-W Sec. line.

Sand about 8' face but too thin. Some asphalt but lean.

Said to be probably the same site as shown on Eldridge map.

Sec. 14, T1S,R3E.

(18) (19) (20) (21)

Name of Occurrence. Buckhorn District, which comprises 12 openings (Eldridge) in 1S, 3E

Location. Murray County. S.E.$\frac{1}{4}$ Sec. 14, T1S,R3E. 9 Mi. NE. of Dougherty.

Information.Source. 2, p. 305; 3, p 23; 6, p. 47; 11, p 8. 12, p. 161. 18, p.10 & 25.

Material Described. Sand Asphalt and bituminous limestone. Thickness 10'.

General Geology. Bitumen in interstices of S.S. The

Sandstone is of Simpson (Ordovician) Strike N50W. Dip 20SE. Moderate % bitumen in veinlets. Veinlets a few inches to 4' long; 1/32 to $\frac{1}{2}$ inch wide.

Commercial Development. Two pits. Undeveloped.

Miscellaneous. Hutchison lists as Loc. # 1.

Another occurrence given by Shelley (1929) as (E) on reverse side of this card:

Name of Occurrence. Sample E.
Location. SW NE$\frac{1}{4}$ Sec. 14, T1S,R3E. Murray County.
Information Source. 14, p. 10 & 25.
Material Described. Horizontal sand and lime.
Bitumen content, 10.74%

#18

Sec. 14-1S-3E (cont) Murray County. 2. (18)
1/8 to $\frac{1}{4}$" white siliceous material. The formation is mapped as McLish on State map. The property (quarry) not operated at present.
See 2-G opposite side of card. SW NW NE 14, 1S,R3E.
Information of J.M.Gorman.

Several test pits 6 x 6 filled with water hindered observation. Dump material showed white calcareous SS with well rounded Qtz. grains. Asphalt is concentrated along the bedding planes of the S.S. Probably 85% SS and 15% asphaltic SS. This is younger than the first above named deposit, because of regional dip, although there may be some faulting.

Buckhorn District 2.

Commercial Development. A prospect pit only.

General Geology. In Simpson formation (Ordovician)

Miscellaneous. A few miles S. of Sulphur, the deposit extends over several acres, about 10' thick. It appears to be excellent for paving because of the amount of limestone in the sand.

Information furnished by J.M. Gorman, U.S. Geologist 2/6/44 in outcrop of sample E on opposite card or nearby Loc. SW NE NE Sec. 14, T1S,R3E. Quarry opened about 1940, 60 x 300'. Stripped. Probably 4-5%. SS. owned

by Southern Rock Asphalt Co. SS boulders N25E., dipping NW overlain by brown calcareous SS. the overburden thickens to the NW. At the present face is an 8' overburden. The SS is cut by vertical joints with trend N75E. On these

---

#19

Sec. 15, T1S,R3E.

(22)

Name of Occurrence. The Moss Pit of Eldridge. Sample No. 47 of Shelley, 1929.

Location. Murray County. SW.SE$\frac{1}{4}$ Sec. 15, T1S,R3E. 1 Mi. N. of Buckhorn.

Information Source. 18, p. 25. Eldridge, p. ; 6, p.49 11, pl 10/ 12, p. 161. 7, p. 8.

Material Described. S.S. with 7-10% bituminous matter.

General Geology. The S.S. is member of the Simpson Fm. called "Dixon sandstone" by Eldridge. The quarried zone is 8' thick, 400' long. There is a "tar spring" about 200 Yds N. of the pit.

Commercial Development. Originally prospected in 1890 was opened in 1897 by the Rock Creek Natural Asphalt Co.

Miscellaneous. Snider, 7, p. 8 states 7-8% bitumen and "probably less than half the deposit removed" (in 1913) Shelley (1929) in 18, p. 25, Table of tests, Sample No. 47, states: Simpson formation; bitumen content, 8.89%

#32 15-1S-3E
NW NW
Murray Co.

Equitable #1 Scott
Asphaltic sd in Pontotoc
215-240 1934 dry hole

#20

Sec. 16, T1S,R3E. Name of Occurrence. Land of W.J. Williams of Sulphur.

(23) Location. E. of the Reservation SW¼ Sec. 16, T1S,R3E. Loc. is inexactly described.

Information Source. 6, p. 55.

Material Described. Lime Asphalt.

General Geology. The deposit was reported to Hutchison who adds nothing.

Commercial Development. Not developed as of 1909.

\#21

Sec. 17, T1S,R3E.

(240)

Name of Occurrence. ~~Ralsboh~~ Quarry, or, locally Legrand. S. bank of Rock Creek.

Location. Murray County. SE. SE$\frac{1}{4}$ Sec. 17, T1S,R3E. 8 Mi. NE of Dougherty.

Information Source. 6, p. 55; 11, p. 10; 12, p. 162; 18, p. 25.

Material Described. Sand Asphalt.

General Geology. The sandstone is a member of the Simpson Fm of Taff. See further descriptions of Eldridge.

Commercial Development. Little development as of 1904, but see Eldridge quoted below.

Miscellaneous. Eldridge (2, p. 294) "This quarry under the control of Messrs. Ledbetter and Legrand of Ardmore. is opened just above the water level in the bluffs of Rock Creek, about 2 miles W-NW of Schley, and about 8 Mi. NE of Dougherty ---. The deposit where exploited is a richly imprgnated, massive Ordovician sandstone, about 15' thick, lying beneath a cap of 75 to 100' of Coal Measure conglomerate. The bitumen contents amount to between 10 and 12% as the average of the present face In hot weather the bitumen seeps from the rock in the

form of maltha. (describes characteristsics of the asphalt) The composition of the rock is of medium sized, rounded, subangular and angular quartz grains held together in bitumen. Upon the removal of the latter the residue falls to pieces - a mere mass of loose, white sand. --- The age of the S.S. is Ordocician but the time of its impregnation is uncertain It may have been either prior to or subsequent to the deposition of the overlying, unconformable conglomerate The fact that the lower member of the latter formation are somewhat impregnated with bitumen is not conclusive evidence in either direction, for they might have been infiltrated with or from the S.S. itself.

There are, however, occasional pebbles of bituminous S.S. sufficiently isolated from the enriched
Shelley, 18, P. 25, Sample No. 53 says in Simpson, with bituminous content, 6.99%.

#22 Sec. 21, T1S,R3E

(26)

Name of Occurrence. Quarry No. 4 of Gilsonite Paving & Roofing Co.

Location. Murray County. NE SE$\frac{1}{4}$ Sec 21, T1S,R3E. 200Yds, N.E. of the Loc. which is in S.E. of S.E.

Information Source. 6, p. 52; 11, p. 10, 12, pl. 161.

Material Described. Limestone asphalt as in other nearby quarries.

General Geology. In this, the Viola, possibly Upper Bromide of Gorman, a zone of enrichment 10' thick. Presence of calcite bodies locally depreciate values.

Commercial Development. Consists of a small hole in the asphaltic limestone.

Miscellaneous. See 2 other cards same $\frac{1}{4}$ Sec.
Information furnished by J. M. Gorman. U.S. Geol. Survey, 2/6/44. Loc. 4-G N$\frac{1}{2}$ SE sec. 21, T1S, R3E.
See opposite side for approximate Loc.
Showing of asphaltic SS appears at several points in stream beds. Not commercially important.

#23

Sec. 21, T1S,R3E.

(25)

Name of Occurrence. Hutchison describes as Loc. #15 of the Buckhorn district. Murray Co.

Location. Between NE 1/4 Sec. 20 and NW$\frac{1}{4}$ Sec. 21, T1S,R3E.

Information Source. 6, p. 56; Woodruff, and 12, p. 162

Material Described. Sand and conglomerate asphalt. Vanoss fm.

General Geology.

Commercial Development. Only one small prospecting pit. "The location should repay.

Miscellaneous. The occurrence is near the line between the NE$\frac{1}{4}$ Sec. 20 and NW$\frac{1}{4}$ Sec. 21, It is mainly on the N side of a ravine. Asphalt oozes from the S. S. and conglome ate as maltha which extends several hundred feet.

#24

Sec. 21, T1S,R3E.

(27)

Name of Occurrence. Quarry No. 8 of the Rock Creek Natural Asphalt Co.

Location. Murray County. SE SE$\frac{1}{4}$ Sec. 21, T1S,R3E. 7-1/8 Mi. N.E. of Dougherty.

Information Source. 6, p. 52; 11, pl 10; 12, p. 161; 18, p. 25; Samples 50, 51 , 52.

Material Deseribed. Lime asphalt. Percent saturation av. 5-6_. See Quarry No. 4 in the same $\frac{1}{4}$ Sec.

General Geology. See notes on Quarry #4.

Commercial Development. Quarrying was by open cut and hillside methods, but was never extensively operated. Apparently large supply of material accessibility

Miscellaneous. See SW SE¼ Sec. 21 and See. 18, p. 25. Samples 50, 51, 52 showing in Simpson, with bitumen 6.38%.

25

Sec. 21, T1S,R3E. Name of Occurrence. No. 4 Quarry of the Gilsonite Paving and Roofing Co.

(28) Location. SW. SE¼ Sec. 21, T1S,R3E. Murray County. 7 Mi. N.E. of Dougherty.

Information Source. 6, p. 52; 11, p. 10; 12, p. 161; 18, p. 25. Samples 50, 51, 52.

Material Described. Lime asphalt. Percent of saturation about 5 or 6%.

General Geology. The limestone is Viola, 342'thick, dipping 70 Deg. The rock generally massive. Texture

granular and crystalline, the latter being the most quarried.

Commercial Development. The quarry includes 128' of total thickness, The breast is 400' long and 15 to 75' high. The quarry, formerly important, was idle as of 1909.

Miscellaneous. See also SE SE Sec. 21. And See 18, p. 25; Samples 50, 51, 52 showing in Simpson, with bitumen 6.38%.

#26
Secs. 21, 22, T1S,R3E.

(29) (30)

Name of Occurrence. Three quarries called by Eldridge, the Kirby Quarries.

Location. Murray County. 2/3 Mile N.W. of the Asphalt mine near the old mill and store. The NW. NW$\frac{1}{4}$ Sec. 22, and the NE. NE$\frac{1}{4}$ Sec. 21, both in T1S,R3E.

Information Source. 2, pp. 301-303; 6, p. 50; 11, p. 10; 12, p. 161.

Material Described. The Dixon S.S. member of the Simpson

as described in Moss Quarry.

General Geology. See detailed description by Eldridge, in 1901, pp. 301-303. Productive SS in Quarry #1, only Tr. Bitumen. It is influenced by the Bodine fault, Quarry #2, 8% bitumen in interstices.

Commercial Development. Openings were made in 1895 and 1896. Idle as of 1909. Three quarries; largest 100' in vein 8-10' thick asphalt ~~veins~~ varies from a trace to 9%.

#27
Sec. 22, T1S,R3E.

(31)

Name of Occurrence. The Bodine Quarry, Loc. No. 6 of Hutchison.

Location. Murray County. NW SE NW$\frac{1}{4}$ Sec. 22, T1S,R3E. 6 Mi. NE of Dougherty.

Information Source. 2, p. 303; 12, p. 161; 6, p. 50; 11, p. 8; 18, p. 10 & 25. No. 18 describes as Sample 48.

Material Described. Saturated S.S. with 7-8% bituminous matter in interstices.

General Geology. Opening is on the so-called Bodine Quarry a member of the Simpson. Dip is S.S., about 25 Deg. S.E. Thicknes of saturated zone reported 32', but this inexact. The deposit cut off by the Bodine fault at the West.

Commercial Development. As of 1909 this quarry had not been as extensively operated as the Moss Quarry. It was then controlled by the Rock Creek Natural Asphalt Co.

Miscellaneous. Shelley (1929) gives the content of bitumen in the sand as more than the above, viz: 9.37% The sample G. was taken from a good exposed face. The thickness of the impregnated zone is 25' and the deposit is extensive. Agrees in other respects.

#28

Sec. 22, T1S,R3E.

Name of Occurrence. Sample No. 45 of 18, p. 25.

(32)

Location. Murray County. SW. NE¼ Sec. 22, T1S,R3E.

Material Described.

General Geology. Shelley, 18, p. 25. says Sample 45 in the Simpson formation, bitumen content, 6.37%.

Commercial development.

Miscellaneous. Information furnished by J.M. Gorman of US Geological Survey 2/6/44. Loc. See 3-G above.

SE SE NW-NE Sec. 22, T1S, R3E. A prospect opened by the Southern Rock Asphalt Co., 150' x 75'. Fine grained asphaltic SS is exposed at the E. end of the pit, and this contains white non-calcareous veinlets, of probably 3-5% bitumen. This dips steeply to the SE. It is possibly Tulip Creek SS; different from that at Gilsonite.

Ben Belt's field notes O.G.S. (1909) have the following reference which may apply generally to this Sec.

"The asphalt in Sec. 22, T1S,R3E is in a siliceous Ls. I do not think there is any ledge of glass sand in this section."

Sec. 22, T1S, R3E. Name of Occurrence. Gilsonite Roofing and Paving Co. Mine Murray County.

(33)

Location. S½ SW NE¼ Sec. 22, T1S, R3E. 7½ Mi. NE of Dougherty.

Information Source. 2, p. 298; 6, p. 48; 11, p. 10; 12, p 161; 18, p. 10 & 25.

Material Described. Limestone Rock asphalt varyingly charged with bitumen. See below.

General Geology. See below. Shelley (18, p. 10 & 25) says Hunton (?) Siluro-Dev. age. Gorman says up Bromide

or Viola.

Commercial Development. Exception in that operated by mining underground. Opened in 1896, carried to 180' with face 70' x 18'. Hutchison mining costs $2.00 per ton. Shelley's ample F. from the face tested 5.83% bitumen.

Miscellaneous. Eldridge, p. 298 thus:

"Number Three Limestone. This mine the property of the Gilsonite Paving and Roofing Co. is located in the center of the Buckhorn district. It is opened by an incline on the No. 3 limestone, mining methods having been followed rather than quarrying, by reason of the dip, about 30 Deg. ---The upper five feet of limestone is coarsely crystalline, distinctly fossiliferous; a trace

of bitumen in the lower portion.

(Follows description of limestone beds)

The portion of the bed mined includes only the 2nd and 3d layers from the top, the rich zone of 10' and that immediately underlying, 4 feet thick, the product thus far derived from these two beds probably amounts to several hundred tons. (as of 1901) The mine is equipped with hoist and steam drills, and the company has at this point a small machine shop and store. Near by also is the factory at which mastic and street topping are made."

See Paul G. Shelley (1929): "The sample (F) is from the only underground asphalt mine in Oklahoma, of the Gilsonite Paving & Roofing Co., about 5 Miles S. of Sulphur, which started about 1896" Fine grained crystalline Ls. is the country rock. Tunnels follow the dip (20 Deg.) Now filled with water.

#29
Sec. 23, T1S,R3E.

(34)

Name of Occurrence. Buckhorn District, Hutchison (6) lists as Loc. #2, 1 Mi. S. of Loc. # 1.

Location. SE SE¼ Sec. 23, T1S,R3E. Murray County. ½ Mi. NW. of Buckhorn

Information Source. 2, p. 305; 6. p 47; 11, p. 8; 12, p. 161; 18, p. 25.

Material Described. Fossiliferous limestone yielding 14-15%.

General Geology. Strike of bed is here S62E. Dip 30 Deg. to N. Vein rock crumpling subsequently filled. The quarried strata are Lower Coal Measures (per Eldridge). Vein 18" wide & 25-30' long.

Commercial Development. The Gilsonite Roofing and Paving Co. formerly operated 2 quarries. Of these the richer was Quarry No. 2. The cut was 400' to depth 20-30'.

Miscellaneous. Hutchison's Loc. #3 is 300 Yds. SW of this location.
Shelley (1929) 18, p. 25, Sample No. 43; Formation, Simpson; Bitumen content sample No. 43; 12.96%.

#30

Sec. 26, T1S,R3E. Name of Occurrence. Buckhorn District. Hutchison lists as Loc. #3.

(35) Location. Murray County. NE NE Sec. 26, T1S,R3E. 300 Yds. SW of Loc. #2. 2 Mi. N.E. of Dougherty.

Information Source. 6, p. 48; 11, p. 8; 12, p. 161.

Material Described. Quartzose limestone (Pennsylvanian) carrying some bitumen.

General Geology. The structure is in alighment with the Loc. #2 (NE-SW)

Commercial Development. Stated is worthless account of irregular deposition and poor content. Quarry pit 75' x 450' Carry ~~6-8% asphalt abandoned.~~

Miscellaneous. Vein 18" x 75' - 25'-30'long.

#4 OKLAHOMA ASPHALT Murray Co.

E.G. Woodruff, Construction Materials of Oklahoma, 1934, (11) P. 8.

Describes:

Southern Rock Asphalt Co. plant at Dougherty the Col operates crushing and mixing plant 1½ miles NE of Dougherty. Theproperty consists of a Ls. quarry and sandstone quarry (See other cards) equipment, for quarrying and transportation, crushing, screening and mixing machinery, and field testing laboratory. The plant employs 400 men, can handle more than 30 cars of asphalt road material daily. The product for cold rolling.

The sand quarry (see NW 28-1S-3E) Operations along a 200 yard face. In the worked out area dip is 20 deg. to N. but in newer operations dip is less steep.

Overburden of soil etc. with some asphalt, 12-19'.
Sandstone saturated with asphalt. 26'

Shooting with dynamite the debris is loaded by steam shovels. The underlying asphaltic S.S. uncovered thereby is drilled and shot and loaded in small pieces.

The limestone quarry is located a short distance N.E. of the mixing machinery. Two or three acres of the Ls. has been removed. Now a face about 500' long and 75' deep. A dense brittle Ls. with few joints planes and many crevices. The dip is 42 deg. E. The lower 20' of the deposit is richest. The method of handling is to drill small holes from the top, shoot same, loosening sufficiently to load. Millions of tons available.

Crushing and mixing plant. The rodk is sent into bins, it is discharged at the bottom to a conveyor. The discharge is regulated to the proper amount each of Ls.

and S.S. to make a mixture. The belt conveys the mixed rock to hammer mills where it is crushed to a half inch or so, and thoroughly mixed. Then it is conveyed to screens to return oversize fragments for recrushing the mixed material delivered for shipment. Cars are sampled and tested in the laboratory. The material is a cold rolled mix for surfacing highways.

Hayes & Hayes. C.P.A. probably appraised this property

R.D.Farmer Okla. City Mgr.

Sec. 28, T1S,R3E. Name of Occurrence.

(36) Location. Murray County. NW$\frac{1}{4}$ Sec. 28, T1S,R3E. One-half Mi. S.W. Quarry No.4 of Gilsonite Co.

Information Source. 6, p. 55; 11, p. 8.

Material Described. Sand Asphalt.

General Geology.

Commercial Development.

Miscellaneous. Merely reported by Hutchison with no definite comment.

Woodruff (1934) p. 8 refers to sand quarry in NW Sec. 28, T1S,R3E, 7 Mi. NE of Dougherty. This is tributary to a plant of the Southern Asphalt Co. (of Okla City) 1½ miles NE of Dougherty, which is described elsewhere.

Another quarry of the Southern Co. is a Ls property which also is elsewhere described.

Sec. 29, T1S,R3E. 31

(38)

Name of Occurrence. Bob Wright land, leased to Downard Asphalt Co. as of 1909.

Location. Murray County. NW NE¼ Sec. 29, T1S,R3E.

Information Source. 6, p. 56; 12, p. 162.

Material Described. Sand Asphalt. Impregnation 7% to 8%.

General Geology. The impregnation zone is the equivalent of Eldridge's Dixon or Bodine S.S. in strata of the Simpson S.S. and shale lying nearly level.

Commercial Development. Development by pit 50' x 100'

down 38' in asphalt. Hand drilled for blasting, hoisting by geared horse whim.

Miscellaneous. Exaggerated estimates of thickness of asphaltic sandstone encountered in a deep welldrilled 150' to the S.W.

Shelley (1929) No. 18, p. 10-11 & 25, describes under heading "Sample H." :

Location. NE NW¼ sec. 29, T1S,R3E.
Information Source. 18, p. 11 & 25 (as above)
Material Described. Asphaltic sand.
General Geology. Simpson formation (Ordovician)
Commercial Development, etc. The sample (H) is from Western Paving Co's "Sand Mine". In 1929 was being worked as open quarry. The

Bob Wright land 2.

face about 30 x 100' and an overburden of 30'
The bitumen content varies in different parts of the property; an average taken in sample H. is 9.57%.

#1

30 - 1S - 3E
SW NW SW
also 25 - 1S - 2E

Dougherty or Brunswick district
2 large quarries in Viola limestone
(Southern Rock Asphalt Co.)
3.0 - 3.5 % asphalt
Principal source of asphaltic ls
in this region. Crushing, screening
+ mixing plant here
Hutchison, Woodruff, Abraham
Snider + Gorman.

See Gorman

#3

Sec. 32, T1S, R3E.

(39)

Hutchison gives
sec. 33 Omitted

Name of Occurrence. The prospect on land of W.J. Williams of Sulphur.

Location. Murray County. Exact location not at hand but in Sec. 32, T1S, R3E about 5 Mi. N.E. of Dougherty.

Information Source. 6, p. 87.

Material Described. Asphaltite-like. In a vein. Might be grahamite.

General Geology. The vein is in the Woodford chert (?) near the top, 10 or 12' below the Sycamore Ls. The vein is 18" thick at the top and 7' at the bottom of the 76' shaft. The deposit appears to be along the bedding planes of the chert of the Woodford.

Commercial Development. The prospect consists of a shaft 76' deep. The material had not been tested at time of Hutchison's report (1910) but it was commonly considered a fuel asphalt, which differed greatly from the grahamite found in 6-2S-4W. The Williams material dull, lusterless, waxy black, subconchoidal fracture, burns to ash in open air without melting.

(It appears that this Htuchison report offers very little of original investigation of this occurrence.

MURRAY

#9 ~~CARTER~~ COUNTY. (7)

Loc. NW SW 10- T2S-R2E, 5½ miles W. and 1 mile S. of Dougherty.

C. W. Tomlinson says, Slightly bituminous thin sand (6"-1') or sandy Ls., in the Upper Arbuckle, 100 yds. W. of Highway 77. This has no commercial importance is quoted only as an example of impregnation of an early formation.

Omitted from table
#8

#34

7-2S-1W
NW SE NE
Murray Co.

McGillis #1 Banks
Bromide at surface
Shows of asphaltic oil
reported from depths 125 to 175'
in Simpson

√

Sec. 8, T1S,R1W. #7

(5)

Name of Occurrence. 2½ Mi. SE of Hennepin (?) Tentatively from Eldridge.

Location. 8, T1S,R1W in Murray County,Willians Ranch 3 Mi. S.E. of Hennepin.

Information Source. Only Eldridge, 2, p. 313. to be checked later.

General Geology. In Permian Red Beds.

Commercial Development. A prospect pit in Limestone.

Miscellaneous. Following quoted from Eldridge, pp 312-313 "At the western end of the Arbuckle Mountains, in the vicinity of Hennepin, Homer, and Elk, and even as far west as Robberson, a number of oil seepages in the water of wells, springs, or prospects were reported to the writer. These were accepted as evidence of the general distribution of oil in as yet undetermined quantities, bu the only places visited were the Williams Ranch, 3 miles S.E. of Hennepin, where a seepage of oil occurs in the wa ter of a small prospect pit in limestone the only asphalt being found along thin seams in the fractured rock; a small pit exposing an inferior bituminous limestone on the Elk road 2½ to 3 miles S.W. of Hennepin and the Nelson prospect, 2½ miles S.E. of Elk. A specimen

2

reported from the Robberson occurrence indicates it to be a surface deposit from an old maltha spring."

(Note - in connection with surface indications of oil, in 1901.)

Muskogee — 6, 14N-19E

Jolly Patton

Oil from Penn. sd @ 500'; Disc. 1928

SW NW sec 6, producing sand close to top of Dutcher at 500 feet - 150 bbl/well
Top of Dutcher sands 365', base 700-820'
OGS Bull 57, p.107

on map
on sheet

Muskogee Co — 9,10-14N-18E

Chicken Farm oil field (part of Muskogee field). Oil from Oswego @ 400 feet

OGS Bull 40, vol 1, p.130

on map

Nowata County

Alluwe-Field
Bartlesville sd. 350 - 475 feet
+ other higher sands

14-28N-15E
Nowata

Waterflood Stray sand, 580 acres
Depth 500

R.OR. Sec. Rec. 1962, p.304

4-27N-15E
33-28N-15E
Co
Nowata Co
Lenapah field

Production from 220 feet, 515 etc
p.348 BGS Bull 19

23, 24, 25N-17E
Nowata Co
Alluwe ~~Nowata~~ field

259 acres in sec. 21, 28, 32 Bu.
R.OR. Sec. Rec. 1962, p. 232
Alluwe
2283 in sec. 34-35 25N-17E p.233
Bu. " 4,5,8,9, 17+18 450 feet
in 24N-27E
400' 5,-23N-17E; 27-28 29 30 20, 19 - 24N-17E
p.234

W/2 SW 31 25N-17E

Nowata
Alluwe

Bv. 430 feet. 24 wells. Waterflood

R.O.R. Sec. Rec. 1962, p. 240

NW 13 26N-16E

Coodys Bluff Fld. Nowata Co.
Big Creek pool.

Waterflood.
14 wells, Bartlesville 210 acres
500 depth. ✓

R.O.R. Data on Sec Rec
1962 p. 40 & p. 114 ✓
~~320 acres~~
parts around corner of 22, 23, 26, 27
94 wells.

23-29N-15E

Nowata Co.

Oil wells at 100 feet
Sands above & below Lenapah ls.

p. 13 Bloesch, Edward 1928, Nowata & Craig Counties in Oil & Gas in Okla.
Bull. 40-EE

W½ SE¼ 23 29N - 16E

E½ 26 NE¼ + N½ SE 26

Nowata Co

Water Flood - Squirrel sd

Depth 417 12 wells

R.O.R. Sec Rec.

1962 p.22

Nowata Co

Alluwe field

BV sand at 400 + Burgess at 460

Scouts yearbook

Howe

Nowata 27N-15,16E

Nowata-Claggett

Bartlesville sand @ 300'

Scouts yearbook.

Omitted from map

Okmulgee Co — 26-13N-12E
NESENW.
Okmulgee District

Senora sd. prod. 445-470 5BOPD 1954

35-13N-12E
Atkins prod.

Senora 520-536 5BOPD 1960.
OW for water flood.

Okmulgee Co

1) "400' sd." now called Peach ~~Orchard~~ 1950 sec. 7,18 p. 4
near Morris T.13NR14E ~~SE7, 18~~ NW 29 map 2

2) 26, 35 T.13N.12E dev. in 1917 p. 4
460' depth

3) SESENE 7-14N-15E
Peach Orchard 302-314' Gr. 36°
Drld. 1963

Also Research Oil Reports cardfile

See Logan, D.M., 1957, Geol. of Okmulgee District

Okmulgee Co — 8-13N-14E
NWSW SW

Oil sd. 460-478 8 bbls oil 1919

NW SW

Oil 456-476 15BOPD

SENWSW

oil sd. 456-476 10BOPD 1919

NE NW SW

oil sd. 480-478 # 7 others in SW/4 in CC files

Okmulgee Co. 18+19 - 13N - 14E
19 - 13N - ~~14E~~

SENE~~NE~~ CC files

Oil ~~4~~46-458 + 462-469 2 bbls 1949

18 - 13 N - 14E

SWNWSE

Oil sd. 451-462, 464-486. 4 BOPD 1941

NW. 1920 349-468 sd. 2 bbls

7 ~~older~~ in CC files above 500 feet.

Osage Co.

9-20N-12E
W/2 SW NENE
Osage Co

Bushman
1-L Osage
12/1963
Oil in Bighime
Gravity 39°

Flat Rock.

Big 475-510'

RoOR cards.

Osage SE 8, SW 9, NW 16, NE 17
21 N - 9E
E. Osage district

In 1940 27 wells prod oil from Okesa - Torpedo - CC
sd zone at depth of about 250'
drilled in 1928
gas pressuring in 1940

1940 USGS 900-11 p. 288

Onhalpt 30- 21 N-9E

Osage City field

Okesa - Torpedo - Clem Creek sd zone
at about 300' (called Buzzard)
IP 25-100

On map

USGS Bull 900-H p.277, 286, 287

Osage Co SENW SW, NWSE SW.
SESW NE SW
SWNESW SW 1/4 36-22 N-8E
Torpedo 574 - SEBE NW prod.
Clem Cr. 597
Osage City field
Osage Co
W.S. Ingersoll

Buzzard sd 400-500' Grav. 41°

Field - Osage City

on map

ROR cards

W/29, E/2 28, NE 32 23 N-9E

NE Sunset field

Okesa + Torpedo sds - 300-600' yield
oil + gas on the dome.

30 SENWNW Buzzard sd. 505-515 (1959)
pp10 BO + 47 BSW.

on map

USGS 900-B. p.81 + pl.2

32 - 23 N - 9E

1954-55 Okesa sd. E/2 NW NE 238-342 Oil
SW SE NW NE 1 1/2-15 1/2 BOPD

CW Oliphant #5, 9 Osage.

ROR.

Osage. 17, 20, 21 23 N - 9 E

Signal Hills Field.

Okesa @ 430. Dis 1944 Scouts Yearbook.
Ref. Scouts Yearbook.

Mathews et al #1 Osage (1958) On map
SW SW SW 20-23N-9E
Burgess 438-442 PP 10 BO + 50 sw.
Savage #8 Osage 1954 NESWNW 21-23N-9E
Burgess sand. 430-442 1/2 BOPD

Osage S/2 19, N/2 30 23 N - 9 E
Manion field
Manion ant.

Oil-bearing bed at a depth of a little less than 500' prod. from what is the ? Torpedo sd.
30' thick 10-100 bopd.
Wells drilled in 1958 in NWSE SE 19, ~~SWSW~~ SE + NWSE had oil in Burgess 455-485 10 BOPD
1961 in 30 SENWNW, SESWNE
USGS 900-B, p. 57, 80 On map

Osage $^{NE}15, ^{NW}16$ 24-N-8E

Wheeler dome
~~Happy Hollow field~~
~~or Tidal Osage~~

Revard + Cheskewalla sands
a lower ~~bed~~ in Nelagoney fm.
sd 30' thick. depth about 500'
IP 5-100 bbls/day in 19 wells.
As of 1924-1937 in NE/4 16 22847 bbls prod.
& twice this amt in NE/15
USGS 900-C p. 92, 95, also pl. 3

on map

Osage E½ 12, 13 21 N-8E
NW/4 7 21 N-9E
~~Osage City field~~

Oil from Okesa - Torpedo - Clem Creek
zone from 550-600 less 50 bbls/day
extends eastward in 7-21 N-9E

Omitted

Osage Co. NE/4 28 N/2 29, 30 25N-8E

Atlantic field
~~East Cold Creek ant.~~
~~Cold Creek anti.~~
Cold Spring ant.

Clem Creek? oil + gas ~~sands~~
depth 1,100' I.P. less than 50 to 75, 30' thick
Gas from Chesewalla

Omitted

USGS 900C p. 92, p 105-106

Osage Co. W/2 32, E/2 33 24N-8E

Falls anticline

- Northern part of Hominy (Osage) oil district

Okesa sands are imp. prod. - Called Buzzard sd.

Mostwell found oil at 700' in a thin

sand in upper part of Ochelata

IP 5-60 barrels/day

Omitted

USGS 900-C p.92 f100.

OKLAHOMA ASPHALT.
OTTAWA COUNTY.

Samuel Weidman. "Miami-Picher Zinc-Lead District" O.G.S. Bull. 56, 1932. Pp. 133, 134.

"Beaver Mine, Located in SW SE Sec. 19, T29N, R23E. Much tar was encountered in the ore in 1928 and 1929 at the 258 foot level extending SE toward Cardin Station. The tar not only drips down from the roof but also oozes up from the floor of the stope. The upward movement of the tar may suggest that its source is in the underlying strata. However, the Beaver Mine was started in 1916 at the 278' level and this part of the mine has probably been dewatered approximately down to the 274' level for at least 10 or 12 years. During this period of this part of the mine the tar has probably been seeeping down thru fractures from the overlying Cherokee shale; hence the tar now oozing up from the floor of the 258 foot level evidently came from the same source as that now dripping from the roof."

P. 68. Hydrogen compounds. - Bitumen, known as "tar" by the miners, occurs in appreciable quantity in some of the mines. The source of the tar is very probably in the coal seam(??) and in the oil-bearing phases of the Cherokee shale that overlies the ore bearing rocks. It formerly occurred in abundance in the tar spring in Cardin; Tar Creek so named. In some mines tar in abundance dripping down from upper stopes. Tar from the Gordon Mine (Possibly this is the same as the Lennan mine mentioned by Siebenthal, which see) is utilized by the Picher Roofing Co.

Weidman 2.

P. 149. The Gordon mining property (See just above) in the E. part of 18, 29N,23E. In 40 acres in NW of SE of Sec. 18 the Gordon mine tar is encountered. The ore is roasted before being crushed and milled. In the abandoned stopes at the "Tar Shaft" the rate of accumulation is 5-6 bbls per week from a roof area of 120 feet. The rate of accumulation varies. It is greater at or after rainy spells. The tar is collected by the Picher Roofing Co.

P. 23. Describing the Cherokee formation: "In some places are occurrences of bitumen; a few tar springs, the most notable of which, on Tar Creek are now covered with debris from the Cardin Mines."

Ottawa County

Fowler (1933)20 p. 1444. Without definite location on the section, describes "Oil Seepages". Apparently the occurrences are in the $W\frac{1}{2}$ of Sec. 20, T29N,R23E.

"The mining operations destroyed a few oil seepages that were surface phenomena in this area. The largest was within the present townsite of Cardin, Oklahoma, on the banks of Tar Creek, so named because of these seepages. Other springs were found along this stream which flows thru the field. The oil accumulations which were the sources of these seepages were due to structures similar to those already described, and the origin of the oil was similar. It reached the surface thru shear or fissure zones in the Cherokee shale, altho compared with the great number occurring in the formation below, very few of these shear zones penetrated the shale."

Ottawa County.

H.A. Ireland. Mayes, Delaware and Ottawa Counties. O.G.S. Bull. 40 NN, p. 490.

"It is noteworthy that in northern Ottawa County and also in the vicinity of Pensacola gravel occurs on the hills and valleys with the Mayes formation always underlying.--The pebbles are generally composed of flint with a brown outside stain. Portions of the Mayes Ls. are silicified in the zinc and lead district--- These pebbles were reworked out of the Mayes and Boone and laid at the base of the Cherokee. The gravel does not appear in the area of Cherokee exposures. Just W. of the city limits of Miami the gravel is bound together by asphalt. Above the gravel is the yellowish oxidized shale of the Cherokee and below the thin shale and coquina Ls. of the Mayes. East of Miami, along Tar Creek, gravel is

embedded in a ferruginous S.S. with coquina Ls. and thin platy S.S. showing that one source of the gravel is the Mayes. The gravel has been described as occurring in mine shafts." See O.G.S. Weidman.

Ireland, O.G.Bull. 40 NN, p. ~~499.~~ 33

"Asphalt which has accumulated on the floor of lead and zinc mines near Picher is collected. (Loc. probably in T29N,R's 22 & 23 E.) The asphalt drips down from fissures and through core drill holes. These deposits do not occur except where the surface rock is Cherokee shale. The deposits are found in many places but in only a few spots in any large quantities. In one location the asphalt accumulates at the rate of 35-50 bbl per month. The material is used by the Picher Roofing Co. to make a high grade roofing compound. The collectio is due to gravity and seepage and to the fact that the

Ireland 2.

ground water has been drained away by the mine stopes. The origin of the asphalt is from a residue of evaporated and naturally distilled petroleum. Tar Spring on Tar Creek, 6 miles N. of Miami (probably in Sec. 31 or 32, T29N,R23E.) "is so named because of a heavy bitumen which occurs at the base of the Cherokee shale. Deposits are also noted in the layer just W. of the city of Miami and just W. of Afton (possibly in Sec. 32, 26N,R22E, see another card).

These bituminous depositions indicate the former presence of petroleum and are prophetic of the productive oil fields farther to the W. and S."

The last sentence is very suggestive in that, even if no attention was paid to Ireland's ideas in the earlier days, still the asphalt showings may have led some of the South Kansas operators to step over the line into Indian Territory. At any rate so called "surface indications" were there.

~~G.E.~~ Siebenthal. Origin of the Zinc and Lead Deposits of the Joplin Region. U.S.G.S. Bull. 606, 1915.

P. 16. "Ore and bitumen beneath the Pennsylvanian shale. - The lead and zinc deposits at Miami, Okla., lie beneath 40 to 220' of Pennsylvanian shale. The ore and the wall, rocks at places contains much bitumen, and the mine waters are charged with hydrogen sulphide.---The bitumen is interpreted as the residue of an oil that has lost the lighter saturated hydrocarbons by fractionation in contact with shale. The fact that this residue was left at the base of the shale indicates that the lighter hydrocarbons esdaped upward. The ore solutions can not

Ireland 3.

have been descending because the shale is impervious and practically no surface water penetrates the mines. The mine waters, the bitumen andthe ore deposits are therefore in accord in indicating ascending currents."

P. 205-206, Bitumen at the base of the Pennsylvanian shale. "At a place known as Tar Spring on Tar Creek, about 6 miles N. of Miami, Oklahoma, a heavy bitumen oozes in considerable quantity from the bank of the creek at the contact of the Pennsylvanian (Cherokee) shale and the lower rocks. In the mines at Miami the S.S and Ls of ~~the~~ Chester age at the same geologic horizon, the base of the Pennsylvanian shale, are impregnated with bitumen, which, as has already been noted, interferes seriously with the concentration of the lead and zinc ores occurring in the same sandstone. In the

same mines bitumen also oozes from crevices in chert of t the Boone formation below the Chester rocks. The bitumen sometimes interferes seriously with the concentration of the lead and zinc ores occuring in the same sandstone. In the same mines bitumen also oozes fro crevices in chert of the Boone formation below the Chester rocks. The bitumen sometimes interferes greatly with prospecting with the churn drill. Bitumen occurs in Ls. of Chester age at the base of the Pennsylvanian shale just

Ottawa County.

From field notes Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field Sheet No. 194 Sec. 13, T29N,R21E. Lease owned by Boston Mining and Royalty Co.

(1) SE NE Sec. 13, T29N,R21E.					
	Drill Hole No.	2.	Tar	between	230-240'
	" "	14.	"	"	205-210'
(2) SW NE	Sec. 13"	5.	"	"	220-225'
	" "	10B	"	"	220-235'
	" "	13	"	"	235-265
	" "	14	"	"	230-235
	" "	15	"	"	210-240
	" "	20	"	"	220-235
	" "	25	"	"	235-255

	Drill Hole No.	C-37	Tar	between	169-205'
	" "	C-5	"	"	225-235
	" "	C-9	"	"	185-205
(3) NW NE Secl 13	" "	C-17	"	"	197-230
	" "	C-19	"	"	27~~0~~-295
	" "	C-20	"	"	~~192~~-225
	" "	C-27	"	"	225-240
	" "	C-31	"	"	215-245
	" "	C-32	"	"	206-230
	" "	C-33	"	"	170-205
(4) NW NW 13	" "	C-44	"	"	205-215
	" "	C-38	"	"	220-250
	" "	C-38	"	"	185-220
	" "	C-50	"	"	190-230

2.

Tar is found below shale, on top of and sometimes in the underlying Ls.

Field Sheet No. 295. Sec. 13, T29N,R21E.

Area A. Boston Min. & Roy. Co. 200, 000 cu Yds.
Area B. " " " " 563,000 cu Yds.
Area A-Av. 27'-5 acres TOTAL
Area B-Av. 19'-20 acres 763,000
Boston Min. & Roy. Co. 2 holes 26,000
GRAND TOTAL 789,000 cu. Yds.

Ottawa County Dup.

From field notes of Oklahoma Geological Survey. Copy furnished to the present compiler 2/8/44 for his personal inspection.

Field sheet No. 192. Sec. 23, T29N R22 E. Eagle-Picher, lease owner.

(5) Xavier Mine-Drill	Hole	No.	607	Tar	between	316,
"	"	"	"	600	"	"	310-315'
(6) Adams Mine	"	"		82	"	"	320-325'
(7) Mudd Mine	"	"		120	"	"	305-310'

Tar is found below shale on top of sand sometimes in the underlying Ls. and chert beds.

See drill hole record other card.

Ottawa County

Field Notes Oklahoma Geological Survey. Copy furnished to the present compiler 2/8/44 for his personal inspectior

Field sheet No. 294 See No's 186, 190, and 192 on other cards. Secs. 23 & 24, T29N,R22E. Scattered holes Av. 13'- $1\frac{1}{2}$Acres.

Drill hole record.

Loc		Property	No. of Holes	Cu Yds.
(8) NENESE	Sec. 24	Eagle-Picher (Kitty)	2	22,000
(5) NWNE	" 23	Eagle-Picher (Xavier)	2	4,000
(6) SENENE	" 23	Eagle-Picher (Adams)	1	2,000
(7) NESENE	" 23	Eagle-Picher (Mudd)	1	2,000
		Total		30,000

See also T29N R23E.

Ottawa County Dup.

From field notes of Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field sheet No. 190 Sec. 24, T29N,R22E. Lease owner Eagle-Picher Mining Co.

(8) North Drill Hole No.	10	Tar	between	95	&	145'
South " "	80	"	"	110	&	120'

Tar found below shale on top of and sometimes in underlying Ls.

Ottawa County. Dup.

From field notes of Oklahoma Geological Survey. Copy furnished the Present compiler 2/8/44 for his personal inspection. NESE

Field Sheet No. 188 Sec 16, T29N,R23E.

Drill	Hole	No.	F 13,	Tar	between	150 & 165'
"	"	"	F 43	"	"	105 & 130'
"	"	"	F 57	"	"	100 & 105'
"	"	"	F 61	"	"	135-& 145'
"	"	"	F 62	"	"	125 & 135'
(9) "	"	"	F 64	"	"	135 & 140'
"	"	"	F 65	"	"	105-&110'
"	"	"	F 66	"	"	135 & 145'
"	"	"	F 83	"	"	115 & 125'
"	"	"	F104	"	"	115 & 150'

Tar is found below shale and on top of and some-

times in underlying Ls. This is on lease of the Cortez-King Brand Mines.

Ottawa County. Dup.

Field notes of the Oklahoma Geological Survey, Copy furnished to the present compiler 2/8/44 for his personal inspection.

Field Sheet No. 366 states the S½ Sec. 17 and SESE Sec. 18, T29N, R23E. operated by the Eagle-Picher Mining and smelting lease. That in Sec. 18, by Federal Mining & Smelting Co.

(11) (10)

280

Sec. 18, T29N, R23E.

(12)

Name of Occurrence.
Federal Gordon Lease.

Location. Ottawa County.
1 Mi. N. of Cardin, Okla. SW SE¼
Sec. 18, T29N,R23E.

Information Source. 20, p. 1443.

Material Described. Oil seepage in mine.

Commercial Development. None of the oil.

General Geology. The oil reservoir is confined to porous brecciated and sheared zones in the chert, particularly

---

those parts of the zones that lie directly under the shale.

Miscellaneous. Oil in various quantities found in nearly all the structural small domes that are mapped on a major ore bed in the Boone formation.

Ottawa County Dup.

From field notes of Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field sheet No. 181 in SE¼ Sec. 18, T29N,R23E. Federal Gordon lease owners.

NW SE Sec. 18, T29N,R23E.

	N. 40 A.	Drill	hole	No.	F103	Tar	between	84 & 110'
	"	"	"	"	F166	"	"	110 & 135'
(13)	"	"	"	"	F108	"	"	75 & 140'
	"	"	"	"	F109	"	"	90 & 130'
	"	"	"	"	F60	"	"	85 & 170'
	"	"	"	"	F19	"	"	61 & 75'
	"	"	"	"	F58	"	"	100 & 110'
	"	"	"	"	F176	"	"	95 & 105'
	"	"	"	"	F119 F81	"	"	100 & 135' 95 & 115'

SE SE Sec. 18, T29N R23E

	SE 40	Drill	Hole	No.	F 61	Tar	between	120 & 145'
(11)	"	"	"	"	F165	"	"	160 & 165'
	"	"	"	"	F150	"	"	115 & 155'
	"	"	"	"	F152	"	"	145 & 155'
	"	"	"	"	F 10	"	"	182 & 188'
	SW SE	"	"	"	F 90	"	"	90 & 140'
	"	"	"	"	F 80	"	"	100 & 140'
	"	"	"	"	F 82	"	"	70 & 100'
	"	"	"	"	F 85	"	"	205 & 210'
	"	"	"	"	F101	"	"	85 & 165'
	"	"	"	"	F100	"	"	170 & 175'
	"	"	"	"	F167	"	"	100 & 120'
	"	"	"	"	F 41	"	"	95 & 125'

Ottawa County Dup.

From Field Notes of the Oklahoma Geological Survey. Copy furnished the present compiler for his personal inspection. 2/8/44.

Field Sheet No. 171 in NW. Sec. 19, T29N, R23E. Owner Eagle-Picher Lead and Zinc Co.

	Findings	Drill	hole	No. 37,	Tar	between	135 & 150'
(14)	"	"	"	T F 1	"	"	70 & 75'
	"	"	"	26	"	"	120 & 130'
	"	"	"	33	"	"	140 & 145'

In SE NE 19, T29N, R23E. Anna Beaver lease of Commerce Mining & Royalty Co.

Drill	hole	No.	W986	Tar	between	113 & 125'
"	"	"	W202	"	"	120 & 125'

The tar is found below shale on top of and sometimes in the underlying Ls.

Field Sheet No. 173 (See also in practically same Loc. Sample 183-1 on another table card) Loc. of 173 is Sw of Sec. 19, T29N, R23E. Velie Lion owner. (15)

	Findings	Drill	Hole	No. 37	Tar	between	150 & 165'
	"	"	"	53	"	"	215 & 225'
	"	"	"	59	"	"	155 & 165'
	"	"	"	65	"	"	145 & 200'
	"	"	"	92		"	135 & 140'
(15)	"	"	"	95	"	"	125 & 145'
	"	"	"	137	"	"	140 & 150'
	"	"	"	142	"	"	215 & 225'
	"	"	"	291	"	"	110 & 120'

NWSW Sec. 19, T29N, R23E.

Dri Drill hole No. 269 Tar between 165 & 170'
" " " 389 " " 170 & 180'
" " " 400 " " 160 & 165'
" " " 401 " " 140 & 160'

The tar is found below the shale and top of and sometimes in the underlying Ls.

Field sheet No. 175. SE sec. 19, T29N,R23 E. Commerce Mining and Royalty Co. John Beaver Lease.

(18) In SW.SE Sec. 19.

Drill hole No. 106 Tar Between 150 & 160'
" " " 126 " " 170 & 175'
" " " 116 " " 150 & 160'
" " " 115 " " 95 & 135'
" " " 111 " " 130 & 145'
" " " 117 " " 155 & 175'

The tar is found below shle on top of and sometimes in the underlying shale.

Drill hole No. 165 Tar between 130 & 145'
" " " 167 " " 165 & 175'
" " " 171 " " 160 & 170'
" " " 174 " " 170 & 180'
" " " 300 " " 175 & 195'
" " " 338 " " 135 & 140'
" " " 339 " " 140 & 165'
" " " 354 " " 170 & 180'

Sec. 19, 29N,R23E.

NE SW Sec. 19, T29N,R23E.

Drill hole No. 501 Tar between 150 & 165'
" " " 60L " " 160 & 170'
" " " 73L " " 140 & 160'
" " " 78L " " 140 & 150'
" " " 267 " " 160 & 170'

OTTAWA COUNTY

C. W. Shannon, Director Oklahoma Geological Survey. Bull 19, 1917, p. 408.

"The thin capping of Pennsylvanian rocks in the N.W. corner shows seepage of thick bituminous matter calle 'tar' by the miners"

This refers to the Miami zinc mining district and the recongized fact of occurrence of asphalt or tar in the limestone country rock. And further see the "Tar Creek" o the Miami region.

George M. Fowler, Oil and Oil Structures in Oklahoma-Kansas Zinc-Lead Mining District. A.A.P.G. Bull. Vol. 17, No. 12. 1933.

This is numbered Ref. No. 20 on accompanying cards. P. 1436. The Oklahoma-Kansas field of the Tri-State zinc and lead mining district is unique in that some of its mines produce oil as well as zinc and lead ore---The oil is of a dark residual variety and instead of having to be pumped from great depths, comes from above into the mine workings, which range in depth from 150 to 400' from the surface. Furthermore it is a nuisance in operating. In some mines it is sufficiently plentiful to be collected in pumps and sold locally for roofing purposes.**- As mining proceeds with the lowering of the ground water, the oil drips from the roof and sides of the mines in certain areas, having worked its way downward thru fissures and shattered zones from the original oil reservoirs, which

Shannon 2.

were directly under Pennsylvanian shale.-----it has been found without exception that geologic structure definitely controls their localization."

Fowler gives a structure map contoured on a major ore bed in the Boone Fm. See card for Sec. 18, T29N,R23E.

Fowler continues, p. 1443:

"In flat or slightly domed areas and in basins there is little or no oil unless shear zones traverse the areas; in which case the oil also varies in proportion to the degree of deformation and consequent brecciation . Where structural conditions are favorable for oil accumulation, the Chester Ls. as well as the Boone, is generally oil bearing, sometimes hundreds of feet below the surface." See card for Cardin T29N,R23E.

In the above parts are omitted. See other individual cards.

Field sheet No. 177 (above) 1 sample, in NE NE sec. 17, T. 29 N., R. 23 E. Owner Eagle-Picher Lead and Zinc Co. Drippings in the mines. Tar is found below shale and on top of and sometimes under Ls. and flint beds. The Crawfish Mine has a quantity of tar in the upper level

Field sheet No. 179 --2 samples. (See above) in NE S SW Sec. 20. T29N, R23 E. Owner Eagle-Picher Lead and Zinc Co. and Evans-Wallower Lease owners. The tar is found below shale and sometimes in the underlying Ls.

Field sheet No. 183--1 sample (Liquid asphalt, as are the others above) in NE and SW Sec. 19, T29N, R23E. (Anna Beaver Lease) owned by the Commerce and Royalty Co.

(23)

Ottawa County

From Field notes Oklahoma Geological Survey Furnished for personal inspection the present compiler, 2/8/44.

Field sheet no.	177-1	179-1	179-2	183-1
Location	NENE 17 29N-23E	NESW 20 29N-23E	NESW 20 29N-23E	NESW 19 29N-23E
Amount	57000 Cu yds	148000 cu yd	148000 cy	70000 cy
Sp. Grav. as rec'd	11.62 API 60 F.	9.01API 60 F.	11.07API 60 F.	11.27API 60 F.
Sp. Grav. Dry	13.01API 60 F.	8.88API 60 F.	11.14API 60 F.	11.76API 60 F.
Moisture	44.83%	13.41%	5.47%	30.94%
Distillate	48.1%	49.3%	49.94%	47.50%
Residue	51.9%	50.7%	49.59%	52.50%
Penetration	Low	Low	Low	Low

Ottawa County.

Summary of Oklahoma Geological Survey notes on zinc-lead mining district. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field Sheets (See other cards) No's 169, 171, 173, 175, ~~1~~ 181, 188.

Locations Sections 16, 17, 18, 19, 20-T29N,R23E.

Quantity.

Loc.	Area	Property	Thick	Acres	cu yds
SW SE 19	A	Velie Lion	11'	5	130,000
SW 19	B	" "	12'	7	124,000
SW 19	C	" "	16'	5	118,000
SE 19	D	Com,Min (J.Beaver)	17'	8	202,000
Sec.20	E	Evans Walower No.8	20'	5	148,000
SE 18	F	Fed. Gordon	34'	25	1,260,000
SE 18	G	Fed. Gordon	28'	30	1,243,000
SE 16	H	Cortez-King Brand	12'	10	178,000
			Total		3,403,000

Drill Hole record.

Scattered hole Av. 17' -9½Acres.

Loc.	Property	No. holes	Cu Yds.
SW Sec. 19	Velie Lion	6	44,000
NWNW 19	Eagle-Picher Tri-State	1	2,000
SE Sec. 19	Commerce Min & Roy Beaver	1	4,000
SWNENE 17	Eagle-Picher (Goodwin)	2	24,000
NENE 19	Eagle-Picher (Foch)	1	6,000
SWNW 19	Eagle-Picher (Alexander)	2	6,000
SENW 19	Com. Min. & Roy.(A.Beaver(	2	6,000
SWSWNE 17	Eagle-Picher (LaSalle)	2	29,000
NESESE 17	Eagle-Picher(Crawfish)	1	2,000
SESWSW 17	Eagle-Picher (Howe)	1	2,000

Loc.		Property	No. of holes	Cu Yds.
NE SW	20	Evans-Walower No. 8	1	2,000
SE SE	20	Eagle-Picher (OKO)	2	15,000
SE	18	Federal-Gordon	3	26,000
SE	19	Com. Min & Roy. (A. Beaver)	9	70,000
Se	16	Cortez-King Brand-Cortez	4	23,000
			Total	261,000
Carried forward from opposite side				3,403,000
		Grand total	31	3,664,000

See also estimates T29N, R22E.

T. 28 N., R. 22 E. & 23 E.

Cored not found
cards 1 + 2 for
Siebenthal
S.J. 10/1963

Siebenthal 1907 ? Ottawa County USGS Atlas Fol. 148 2 pp (cont) west of Afton, Okla., and also in pockets in the Boone formation in association with the ore deposits of the Joplin region generally. ? USGS Bull 340 p. 187-228

When petroleum is forced thru a bed of shale it is fractionated into its lighter and its heavier components, the lighter parts passing thru the shale and the heavier parts--that is, the bitumen—remaining behind. If the current carrying the petroleum from which the bitumen was derived was ascending, the bitumen would have been left behind at the place where it is now found—the base of the Pennsylvanian shale. Water ascending under artesian pressure may drive oil out of shaly formations, but oil can not possibly go downward into shale, driving out water before it; and if it could, it would leave the fractionated bitumen at the top of the shale. Hence, the ciculating water that left the bitumen, which is closely associated with the ores at Miami, was ascending, a conclusion confirmed by the analyses of the bitumen. On the 240' level of the Lannan Zinc & Lead Co's mine in the Miami district the "tar" seeps from the chert wall of the drift and forms a pool containing several barrels. A sample of this bitumen and a sample of a similar bitumen found below the Pennsylvanian shale in a bore hole in the northern part of the district, near the Kansas-Oklahoma State line, anout 8 Miles W. of Baxter Sprg.,Kan., were analysed by David T. Day of the U.S.G.S. who reports:

'--The examination shows that these two samples of tars from the Miami mining district, contain only about 8% of hard asphalt. They would be classified as asphaltic oils, and that they consist entirely of unsaturated hydrocarbons. Such hydrocarbons would not

diffuse readily through shales or other very close grained rocks. The unusual fact that they contain no saturated hydrocarbons, whatever indicates that a proportion of saturated hydrocarbons has escaped by diffusion into the close-grained rocks, leaving this material as a residue This ~~is~~ would necessarily take place with a crude oil, containing saturated and unsaturated hydrocarbons, in contact with Pennsylvanian shale and would entirely accord with your idea as to fractionation of this petroleum at the base of the shale!"

Sec. 1, T25N, R22E.

(28)

Name of Occurrence. Afton.

Location. Ottawa County. Sec. 1, T25N, R22E. Very generally given by Hutchison, 6, p.77.

Information Source. 6, p.77.

Material Described. A rock asphalt reported to have been encountered in a cellar and a well at some point in the above section. Also reported occurrences of heavy oil near the surface and asphaltic bitumen impregnating S.S. west of Afton. Nothing definite. See also Craig County.

General Geology.

Commercial Development. None.

Miscellaneous

13-27N-23E
SW NE NW
Ottawa Co

C.W. Thrall #1 LeRoy Davis

Elev. 865 Gr.

lime well oil saturated
380-391
Small well

Drld 1954

on map
5/64

Ottawa

Miami SE
Ottawa Co.

380', 13' pay, Arbuckle Dec. 1955
Shown as gas well

Scouts Yearbook

Omitted

9-2N-15E
Pittsburg Co

Grahamite, identified from material sent to OGS by public
OGS MR. 30 p. 11

Pittsburg County

J. V. Howell is souⁿce of information of the following:

(1) Sec. 35, T2N, R14E. A spring in the Jackfork SS shows oil

(2) Sec. 28, T2N, R15E. Several 1 bbl. wells

(3) Sec. 7, T2N, R16E. Oil spring near a group of shallow oil wells. Probably in the Jackfork sandstone.

(The exact locations should be traced and checked later. Pending such check the locations on the map are in pencil)

28-2N-15E
E½ W½ NENE

Pittsburg Co

Able #4 James

McGee Val

TD365 P. 8 BOPD, prob. Stanley

28-2N-15E E½ NENE

Able #3 James

~~Same~~ well

TD621

Chenoweth, OGN 19, p. 207

8-2N-16E
NW NW NW

Craig #1 Harley
P 10 B OPD gravity 40.2°
Drilled 1946 in Jackfork ss

Depth unknown.

Chenoweth
OGN 19
p. 206

Pittsburg | NE 28-2N-15E
~~Bald Field~~
Pittsburg

452-488
Prod @ ~~432~~', 36' thick, Jackfork
Disc. in 1960
M. L. Edgar #5 D. James NWSWNENE
sec 28-2N-15E IP 76/0, gravity 39

Scouts Yearbook 1960.

OK

Pittsburg | 3N, 11E + 12E
~~South Ashland~~
Pittsburg Co

Prod @ 350' from McAlester
Dis in 1912

Gasfield

Check RDR
Did not check
Omitted

PONTOTOC CO.

See Grandone and others, 1955

Washita River Sub-basin

6-1N-7E

Pontotoc Co.

W. A. Delaney Jr 1 Barrick

75 BOPD @ 868'. TD 918

Atoka sd 29.5° Below 500'

W. Sheep Creek field

new-pool 1963

9-3N-5E

C+S Oil Co 2 Bellis

Pontotoc

Gas @ 910' Cromwell

SW Jones field

outpost 1963

Not on map

Sec. 15, T2N, R4E.

(5)

Dolberg oil District LG 10/63

Name of Occurrence. Roff District. Loc. #4.
Location. Pontotoc Co. SE SE¼ sec. 15, T2N, R4E.
Information Source. 6 p.72.

Material Described. A sulphurous spring brings a viscous heavy oil from crevices of a quartzitic SS.
General Geology. The oil yielding formation is thought to be below the Franks conglomerate. (Not on Arbuckle map.)
Commercial Development. None reported. Daily production of oil perhaps 10 gals.
Miscellaneous. Obm + Ooj outcrop.

Pontotoc County.

L. C. Snider (7, p. 16, 1913) estimates:

"A very conservative estimate of the known deposit at Ada gives 13½ million tons. One of the limestone asphalt deposits is sufficiently large to supply any demands that may be made upon it for many years to come."

See preceding this an estimate of minimum 2¼ million tons in the Carter County district.

Sec. 36, T4N, R5E.

(1)

Name. Sample D of Shelley (1929)
Location. Pontotoc County.
S. W. of N. E. ¼ Sec. 36, T.4N, R.5E.
Information Source. 14, pp. 9 & 25. 18, p. 25.

Material described. Asphaltic sand and lime. Carries 6.47% bitumen.
General Geology. In the Ada formation of Pennsylvanian age. Horizontal bedded sand and lime mixture of unknown thickness but more than 20'.
Commercial Development. The quarry from which sample was taken has been operated by Ross Tipton, of Ada, and the material used without treatment for paving. The operator states the bitumen content increases with depth.
Miscellaneous. The exact location should be checked.

Sample No. 38 (D) of 18, p. 25 shows in the Ada formation; Bitumen content, 6.47%.

(2)

Snider's tests thus:

Locality	Ada
Material	Rock asphalt
Bitumen Sol. in CS_2	7.45%
Character of Bitumen semi-solid	
Spec. Grav.	1.019
Penetration 100g. 5 sec. 25C	81.
Loss at 163°C. 5 hours	4.69%
Consistency of residue	31
Bitumen insol. in 86B paraffine Naptha	21.90%
Fixed Carbon	11.52
Mineral matter	.79

Grading of mineral aggregate.

Retained on 30 mesh sieve	0.00
" " 50 " "	6.3 %
" " 80 " "	36.0
" " 100 " "	18.3
" " 200 " "	25.7
Passing " 200 " "	13.7
	100.0 %

Table, Shelley (1929) 18, p. 25. Sample 39, gives as in the Ada formation, Bitumen content 4.97%.

Address taken from Ada City Directory of 1931, the only one available in the Tulsa Library:

Ada Rock Asphalt Co. (C. R. Tipton). Loc. at the crusher on the Frisco RR. near the O. C. A. A. R.

To be verified later it appears that the property is located in Sec. 31, T. 4 N., R. 6 E.

January 27, 1944. The local Tulsa Frisco freight agent states that Barndollar and Crosbie are operators of the Ada Rock Asphalt Co. property. That company is said to have constant shipments to the Naval Air Base at Norman. It may have smaller contracts. L. G. Denny agent at Ada may be able to advise definitely on amounts etc. The quarry may be 3 miles out of Ada.

Sec. 31, T4N, R6E.

(2)

Name of Occurrence. Ada
District. Pontotoc Co.
Location. NW NW¼ sec. 31, T4N, R6E. 1½ mi. W. of Ada.
Information Source. 6, p. 70; 11, p. 13. 7, p. 12-13. 18, p. 25; 12, p. 163.

Material Described. Asphaltic SS. traceable for 4 miles, but only locally payable.
General Geology. The outcrop along banks of Sandy Creek which probably flows on axis of an anticline. Production horizon occurs in fine grained conglomerate near the base of Taff's Franks Conglomerate. Local dip N70W at low angle, while in NW sec. 6 the dip is opposite. Hutchison states that this sand asphalt is an old oil sand from which volatile matter has escaped.

Commercial Development. First pit opened long before 1909, because of oil running out from an outcrop. One dozen quarries and very many prospect pits since then in the Ada District. During first half of 1909 more than 200 carloads from a single quarry and activity afterward. Av. price received was $2.20 per ton, F.O.B. on cars.
Miscellaneous. Snider, (7, p.12-13, 1913) Quarry 1½ mi. W. of Ada on side of a 100 acre hill. Prospect drilling shows 80' asphaltic rock underlying. Material is level coarse calcareous sand, carrying about 7½% of sticky bitumen. Product is hauled to Ada for shipment. This has been used in paving in Ada, Lawton, Tulsa, Holdenville, Hugo, Sherman and Paris. Very great amount of material available.

Sec. 30, T. 4 N., R. 6 E.

(3)

Name of Occurrence. Sample No. 40 of 18, p. 25
Location. SW¼ sec. 30, T4N, R6E. Pontotoc County.
Information Source. 18, p.25 Sample No. 40.

Material Described.
General Geology. Sample 40 shows in the Ada formation Bitumen content, 4.68%.
Commercial Development
Miscellaneous. See above tests by Shelley (1929)

Sec. 11, T2N, R4E.

(4)

Name of Occurrence

Location. Pontotoc County. $NW\frac{1}{4}$ sec. 11, T2N, R4E.

Information Source. 6, p.72.

Material Described. Hutchison's notice (p.72) is brief. Made no examination. Stated was similar to the occurrence in SE SE. sec. 15, which see.

Dw outcrops. no

General Geology.

Commercial Development.

Miscellaneous.

Sec. 15, T2N, R4E.

(6)

Omitted

Geologic map does not show those rocks here.

Name of Occurrence. Roff district. 2 mi. NW of Roff. Loc. #2. Should it be SE

Location. Pontotoc County, Sec. 15, T2N, R4E. Hutchison does not indicate the quarter section.

Information Source. 6, p.71; 11, p.13.

Material Described. Richly impregnated sand asphalt.

General Geology. In the Simpson series near a fault line between the Simpson and Viola formations. The asphaltic SS. is 10' thick and dips 15° S50W.

Commercial Development. A quarry was opened in 1909-1910 and 20 carloads of rock asphalt shipped from Fitzhugh. Work was suspended.

Miscellaneous. The definite location should be determined.

Woodruff p. 13 could not find. — no quarry

Some one on copy of Hutchisons Bull 2, desk copy of J.O. Beach suggests R5E? quarried

Secs. 28 & 29, T2N, R6E.

(12)
(13)

Name of Occurrence. Segregated Asphalt land, Choctaw and Chickasaw, 480 acres leased to the Farmer Asphalt Co.
Location. Pontotoc County Roff District. Secs. 28 & 29 T2N, R6E.
Information Source. 12, p. 163; 6, p. 72; 11, p.13; 7, p. 14.
Material Described. The deposit usually high in bituminous content.
General Geology. The mineral which consists of Ls., Ss., conglomerate, and shale asphalts, occurs along two faults lines which bring the Hunton Ls. in contact with the Caney shale on the N. and the Viola on the S.
Commercial Development. The Farmer Asphalt Co. opened

---

up quarries many years before, but at time of Hutchison's report, 1910 had been suspended.
Miscellaneous. Snider (1913) 7, p. 14. says: "Near Franks, 480 acres of land containing Ls. shale, and sandstone asphalts, some of them very rich in bitumen, have been segregated." Snider does not publish any tests.

Further reference to Shelley (1929) p. 25. The Table gives SE ¼ sec. 29, T2N, R6E. Sample37. See reverse side this card. The country rock given as Simpson (?), bitumen content 14.26%.

There is a possibility of confusion in locating the sample in sec. 29.

Sec. 24, T2N, R4E.

(7) Omitted

Name of Occurrence. Roff District. Loc. #1.
Location. Pontotoc County. NE¼ sec. 24, T2N, R4E. 300' N. of Frisco Bridge.
Information Source. 6, p.71.
Material Described. Only a bituminous stain in the rocks.
General Geology. Simpson fm. carries the stain.
Commercial Development. Not developed in 1910, and then considered of little importance.
Miscellaneous

Sec. 27, T2N, R4E.
(8)
✓

Name of Occurrence. Roff ~~District. Loc. #3.~~
Location. Pontotoc County. SW corner NW NW¼ sec. 27, T2N, R4E in the road.
Information Source. 6, p.72.

Material Described. Slightly impregnated sand asphalt.
General Geology.
Commercial Development. As of 1910 no development, nor any likely.
Miscellaneous.

Sec. 5, T2N, R~~6~~5E.
NE, and SW.
(9)
(10)

Name of Occurrence. NW of Fitzhugh, Ada District.
Location. Pontotoc County. NE¼ sec. 5; and SW¼ sec. 5, T2N, R~~6~~5E. (Locs. 1 and 2)
Information Source. 6, p.71; 11, p. 13; 12, p. 163.

Material Described. At (1) is occurrence of 3 or 4 seepages of heavy oil. Sand asphalt. At (2) small seeps of oil along bedding plane of fine grained SS.
General Geology.
Commercial Development. No commercial development. The SS. not sufficiently saturated to be of value, at (1). At (2) the seeping of oil seems to be due to supersaturation as the material exposed for forty feet and showed no no tendency to yield so much of the asphalt that it would

be left "dead" Hutchison thus states.

Pontotoc County.

Frederic A. Bush, Sinclair Prairie Oil & Gas Co. notes the Hunton lime with asphalt on the N. side.

½ mile N. of the StoneWall fault on the W. side of the highway and the E. side of Sec. 11, T2N, R6E.

The contact Hunton with Woodford is largely asphaltic.

(11)

Pontotoc 18-4N-5E

Center field
Pontotoc Co

Penn. sd @ 435-64 Gas disc.
Dis. Aug. 1946 650 MCFPD
Texas #1 Gray NESESW

Scouts Yearbook Omitted

Pontotoc

Wilfong
Pontotoc Co.

Prod from Permian sd @ 85, dis 1961
1 well. gravity 22°

Not in Mid-Cont
Oil & Gas files

Dolberg District

22 - 26° gravity oil from
Pennsylvanian ss from 200-400'

8-2N-4E
15-29, 2N-4E

~~24-2N-3E~~

8, 16-20, 30 T. 2N-4E

Dolberg District
oil
Pontotoc Co., Okla

1/1/1962

Disc Mar 1954, 20' thick
3 wells artificial lift

Cum. Prod.
4,515 Bbls

C SW NE SW.	8-2N-4E perf 490-510	6 BOPD	Simpson
SW NE SW	485	4 BOPD	
~~NW NE SW~~	~~483~~		

15-2N-4E NESWSW 108' pp 20 BOPD Simpson Gr. 22
16 2N-4E NESWSE (WC) 245' pp 2 BOPD "
17 2N-4E SESW SW 351-382 pp 3 BO
18 2N-4E NW NE SWSE pf 437-48 pp 2.5 BOPD -13
19-2N-4E SESENW pf 394-409 pp .5-8 BO PD
NESW NW pf 365-440 pp 6 BOPD Bromide
NESW NE p 250-276 "" 6 BOPD
SW SE NE 327-40 8
SWSENE 224-54 15

Drld 1954-1957
From CC. logs + R.O.R.

Pushmataha County.

C. W. Honess. Oklahoma Geological Survey Bull. 40, p.97. The author treats of counties Atoka, Pushmataha, McCurtain, Bryan, Choctaw. Under heading "Asphalts and Related Substances", the following reference to Pushmataha --"Grahamite was mined, intermittently for a number of years at Jumbo, beginning in 1891 and continuing until about the year 1915, when an explosion of gas in the mines killed several men. A fissure vein of grahamite was opened in 1907 near Sardis and operations continued there for about 15 years."
The author continues with references to occurrences in Atoka, LeFlore and McCurtain counties. These are covered in detail elsewhere, but are here quoted for their historical interest.

Further, as to Sardis above, Honess states the length of the vein is one mile.

Honess, p. 98. "The residues of petroleum in the Potato Hills, in N. Pushmataha County, and in the Talihina chert at Stringtown are accumulations in the jointed chert and are of minor importance quantitatively. That which is seen in the fresh deep exposures in the quarry at Stringtown (Atoka County, which see) is in part a very fluid oil, etc."

Jackfork Valley 2 cont, Pushmataha Co.

Color in mass (a and b)	Black
Fracture (a)	Conchoidal
Fracture (b)	Hackly
Luster (a)	Bright
Luster (b)	Semi bright
Streak (a and b)	Black
Spec. Grav. at 77 F. (a and b)	1.18-1.195
Hardness Moh's scale	2.
Heating in flame (a)	Intumesces.
Heating in flame (b)	Softens splits burns
Fusing point (K & S) (a and b)	530-604 F.
Volatile matter 500 Deg. F. 5 hrs.	Less than 1%

Fixed carbon (a and b)	52, 76-55%
Sol. in CS2	More than 99.5%
Non-min. matter insol.	Less than 0.5%
Free Mineral matter (a and b)	0.21-0.70%

NE¼ 31-1N-22E
Pushmataha

Asphaltite vein, prob. grahamite, reported 4' thick in well dug for water at depth of almost 20 feet

M.R. 30, p. 11
Beach, 1945, the Hopper, vol. 5, p. 56

Name: Wade deposit

Loc. Pushmataha Co.
NW¼ SE¼ sec. 1, T. 2 N., R. 17 E

Grahamite

from W. E. Ham, 1963. Not recorded in OGS Mineral Report.

Seefield sheet

(11)

Tm. Beach, 1945, Hopper vol. 5, p. 57

placed on Goodrich map 8/1963

Sec. 9, T2N, R18E.

(1)
(2)

Name of Occurrence. Jackfork Valley. Lease of Ft. Smith Asphalt Co.
Location. Pushmataha County. 10 mi. NW of Tuskahoma. Ne$\frac{1}{4}$ sec. 9, T2N, R18E. (Mine is in SE NE$\frac{1}{4}$)

Information Source. 6, p. 81; 12, p. 248-249; 5, p. 292-293.
Material Described. Asphaltite 19' thick at opening. Taff calls this grahamite. by W E Ham, M.R. 30
General Geology. Country rock SS. and shale of middle Stanley Fm. Dip is S. at 37° at the outcrop. The vein averaging 4' at the surface is parallel to bedding plane to depth of more than 125'; then changes to 47 deg. to the bottom of the mine. A bedding fault overthrust from the S. Slickensided wall rock few.
Commercial Development. One of the largest deposits in the state although not so extensively explored as Jumbo. Was first known in 1906, Taff made first report on it. The mine is on SE NE$\frac{1}{4}$. Said to have traced the deposit by prospect pits for 1 mile E-W. Opening made where asphaltite was 19' thick; max. thickness 25'. The vein is parted near the middle apparently by the branching of the fault. Taff calls the material grahamite without any laboratory identifications.
Miscellaneous. Abraham (1938) States the vein fills a fault in shaly SS. The upper wall is firm. Pillars of grahamite to support the hanging wall. Evidence of large pieces of rock detached and fallen into the grahamite before it became solid. The author reports from personal visit in 1912. Many thousands of tons have

been shipped from here; the vein about exhausted. From 6000 to 7000 carloads shipped in first 4 years, and 50 tons per day at time of Abraham's visit.
Analysis of two varieties (a and b) are given:

Vertical section of the mine is shown by Countesy of the Central Commercial Co. Probably this company may be source of further information.

Taff (1909) reports: A discovery by prospecting 3/4 mile W. and $\frac{1}{4}$ N. of the mine. The dip is 37 deg. S. At depth of 140' in the main entry the vein turns downward cutting the rock beds at slope of 45-50 deg. The fissure that has been filled with grahamite varies in lateral extent and width, also in structure (follows detailed description of structure of the material) "The upper and lower parts of the vein are brittle, like the other grahamite of the region. In contrast with the central part, the fracture and luster of the upper and lower parts of the vein resemble more closely those of albertite."

Sec. 1, T2N, R19E.

(3)

Name of Occurrence. Potato Hills. 5 mi. N. of Tuskahoma.
Location. Pushmataha County. Se$\frac{1}{4}$ sec. 1, T2N, R19E.
Information Source. 6, p. 80. 12, p. 247.

Material Described. Small amounts of grahamite along bedding planes and joints.
General Geology. The country rock is highly siliceous Ls. at the crest of a small E-W broken fold. The rock is Tahlihina Chert.
Commercial Development. Not of economic importance.
Miscellaneous. See similar occurrence in NE$\frac{1}{4}$ sec. 2. Abraham (12) notes both these occurrences without comment.

Sec. 2, T2N, R19E.

(4)

Name of Occurrence. Potato Hills. About 5 mi N. of Tuskahoma.
Location. Pushmataha County. NE$\frac{1}{4}$ Sec. 2, T2N, R19E.
Information Source. 6, p.80; 12, p. 247.

Material Described. Asphaltites and viscous bitumen occur along bedding and joint planes and in solution cavities of the Talihina Chert.
General Geology. The formations are silicified Ls. and slaty shale, dipping 85 deg. S7W.
Commercial Development. Not of economic importance.
Miscellaneous. See also SE$\frac{1}{4}$ sec. 1. Abraham (1934) notes without comment.

Shelley (1929), 18, p. 25, in Table tests lists sample No. 89, which covers SE¼ sec. 2, T2N, R19E, in the Potato Hills, in the Standley fm., with bitumen, 0.73%. This may be the same as that listed as in the NE¼ on the reverse of this card.

Sec. 16, T1S, R15 E.

(5)

MR30 Ham pitts mine
in NW¼ 28-1S-15E
FS show sec. 28

Name of Occurrence. Impson Valley. Jumbo, Choctaw, or Old Slope. Mine
Location. NE corner SE. SW¼ sec. 16, T1S, R15E. Pushmataha County.
Information Source. Taff 1, p.219
12, Abraham p. 250-251.

Material Described. An asphalt mineral closely resembling albertite.
General Geology. Occurring as veins or dikes. Stringers in veins are 4' & 25' thick. Folded, fractured and thrust faulting.
Commercial Development. Choctaw Asphalt Co. opened in 1897-1898. Mine openings at both the above and in SW¼ Sec. 21. Abandoned in 1917. Exhausted.

Miscellaneous. See McGee Valley.
Abraham (1938. See reference above) gives the various names of this mining district which is the second largest deposit in Oklahoma. A lenticular vein occurring in zone of faulting and fracture in shale a series of pockets. Steep vein necessitates hoisting in buckets. Shipment 15 miles to Moyer, Analysis given:

Color, fracture, Sp. Grav., hardness and heating is the same as in the Sample from 2N. 19E. (Jackfork)

Fusing point (K&S method)	460-520F
Volatile matter, 500F. 5 hrs.	Less than 1%
Fixed carbon	48.5-53.0%
Sol. in CS_2	90.5-96.2%
Non-min, matter insol.	0.0-6.0%
Free Min. matter	1.1-6.7%

304

Carbenes	68%
Sol. in 88 deg. Pet. Naptha	0.2-0.7%
Moisture at 100°C.	0.0-0.7%
Carbon	83-90%
Hydrogen	7.14%
Sulphur	1.04-2.24%
Undetermined	6.72%
Saturated hydrocarbons	0.32%

Pushmataha County.

Choctaw Asphalt Co.'s Lease.

					Acres
SE of NE	Sec.	16	T. 1 S.	R. 15 E.	40
E½ SE¼	"	16	1 S.	15 E.	80
W½ E½	"	16	1 S.	15 E.	160
NE¼	"	21	1 S.	15 E.	160
N½ SE¼	"	21	1 S.	15 E.	80
SW SE	"	21	1 S.	15 E.	40
SE SW	"	21	1 S.	15 E.	40
W½ NE¼	"	28	1 S.	15 E.	80
E½ W½	"	28	1 S.	15 E.	160
W½ SW¼	"	28	1 S.	15 E.	80
SE¼ SE¼	"	29	1 S.	15 E.	40
			Total		960

J. D. Northrop, U. S. G. S. Min. Res. 1917, p. 240, states that Choctaw Asphalt Co.'s property abandoned in 1917 account of exhaustion.

Sec. 21, T1S, R15E.

(6)

Name of Occurrence. Impson Valley. Jumbo, Choctaw, or Old Slope

Location. Pushmataha County. SW corner SE. SW¼ Sec. 21, T1S, R15E.

Information Source. 5p.290; 1, p. 219; 12, p.250-251.
Material Described. An asphalt mineral closely resembling albertite. See determination by W. C. Day, U.S.G.S.
General Geology. See description of SW¼ sec. 16, T1S, 15E
Commercial Development. See under SW¼ sec. 16, T1S, R15E. Abandoned 1917, exhausted.
Miscellaneous. Abraham (1938, above reference) Describes as shown on card of SE SW¼ sec. 16, T1S, R15E.
Taff (1909, pp. 290-292) describes under "Impson Valley", thus;

"The first discovery of grahamite deposits in paying quantities in Oklahoma was made in 1897, on a branch of Tenmile Creek, in the W side of Impson Valley, near the S. side of Sec. 21, T1S, R15E." (See at the same time discovery in McGee Valley, T1N, R14E.) "In the following year (1898) the lands, including the deposits of grahamite, were taken under an asphalt lease and operations were begun on a vein 20-25' thick." (See card of Choctaw Co. segregated land)

Samples analyzed by William C. Day:

Comparison with albertite from Nova Scotia (???)

	Albertite	Grahamite
Specific gravity	1.097	1.175
Color	Jet Black	Jet Black
Softens in boiling water	A little	Does not
In candle flame	Incipient fus.	ditto

-2-

	Albertite	Grahamite
Soluble in alcohol	Trace	Trace
Soluble in ether	4%	5.34%
Soluble in turpentine	30%	Almost insol.

Sec. ~~18~~, T1S, R15E.
(7)

Name of Occurrence. Impson Valley, or Jumbo deposits.
Location. $W\frac{1}{2}$ Sec. 28, T1S, R15E. in Pushmataha County.
Information Source. 1, p. 216-224; 6, p.82. p.80

Material Described. Asphaltite originally called coal; ~~later Taff named it~~ Impsonite; later still he called it grahamite.
General Geology. The grahamite occurs along a zone of faulting near top of Standley shale, extends $\frac{1}{2}$ mile N-S. See below.
Commercial Development. The asphaltite first discovered in 1891 by C. E. Wilson. Was considered coal until in 1899 Taff described it as asphaltite. Soon after discovery a mine operated by Dr. H. C. Nash. The Choctaw

Asphalt Co. acquired possession in 1902, but not very active according to Hutchison (1910) Abandoned 1917, exhausted.
Miscellaneous. Hutchison quotes Taff from U.S.G.S. Bull. 380 (1909) thus:

"The formation has been strongly folded upward and thrust over slightly toward the west. The strata have been fractured and probably faulted along a belt parallel with the axis of the fold and near the W. side of the valley. The beds of SS. and shale contiguous to the veins have suffered crushing and shearing to such an extent that they are retained in the walls of the mines with great difficulty after the grahamite has been extracted. Strong pressure has been exerted on the rocks since the bitumen became solid, thereby causing it to become

-2- (con't)

fractured and intimately jointed. The grahamite veins are lenticular and variable in form both laterally and vertically. The strike of the veins has a general N-S direction parallel with the general trend of the rocks. The pitch of the veins is steep toward the E., in the direction of the dips of the rocks, but usually at a greater angle."
See card for Sec. 16, T1S, R15E, for description by Abraham (1938) to cover this and Sec. 21, T1S, R15E.

Comparison with albertite. Composition.

	Albertite	Grahamite
Carbon (Weatherill)	86.04%	86.57%
Hydrogen (Weatherill)	8.96%	7.26%
Nitrogen (Weatherill)	2.93%	

	Albertite	Grahamite
Nitrogen (Day)	1.84	1.48
Sulphur (Weatherill)	Trace	
(Day)	0.17	1.38
Oxygen (Weatherill)	1.97	2.00
Ash	0.10	1.31

Only real difference is solubility in turpentine. The material therefore resembles albertite. (Taff is in error in giving source of the albertite as Nova Scotia. It came from the Albert Mines, Albert County, New Brunswick, Can.)

See also Clifford Richardson (1908) for further analyses, differences, etc. See Proximate analyses on another card.

The material mined in Oklahoma is classed as grahamite.

-3- (con't)

That at Page may be of different class. Assuming that all the bitumen has the same source differences in the enclosing rocks and differences in the time at which the deposits were introduced into the fissures would produce variations in composition.

Asphalt rocks are Standley shale, upfolded and over thrust toward the W. fractured and faulted along a belt parallel to axis of the fold near W. edge of the valley. Pressure exerted on the rocks since the bitumen became solid, therefore fractured and jointed. Grahamite veins lenticular and variable laterally and vertically. Strike of veins generally N-S, parallel with trend of the rocks. The pitch of the veins is toward the E. at generally at greater angle than the dip. Exploitation continuous from

1898 to 1909. (How about later operations?)

Pushmataha County.

SE corner Sec. 29, T1S, R15E. J. V. Howell is source of information. "A liquid oil seep in the Standley Fm."

(Pending later check this notation is placed on the map in pencil)

(8)

Pushmataha County.

Thirty-sixth Annual Report Oklahoma Department of Mines and Minerals.

"P. 43 New Asphalt Mine in Pushmataha County. T. J. Page, Superintendent, Clayton, Oklahoma. No production."

"P. 31. Gilsonite Mines. J. T. Payte, Oklahoma City, Okla, Owner.

This mine is located on the line of McCurtain and Pushmataha counties. It is a truck mine and has no official name it was opened in October, 1942, and 4 men working removed from the ground 26 tons. This was shipped to the Central Chemical Co. at Chicago, Illinois. No other production."

(See letter of H.B.G. dated 4/26/44 trying to reconcile the two above and get exact locations for spotting on the map.)

Pushmataha County.

NW NE sec. 6, T2S, R15E. J. V. Howell, source of information states "Grahamite in Stanley".

(Pending later check the notation is placed on the map in pencil)

(10)

Pushmataha County.

From Field Notes of Oklahoma Geological Survey. Copy furnished for the personal inspection of the present compiler. Apparently the record is a report of the State Mineral Survey (1935-36). Co. Supv., R. M. Holland, Antlers, Okla.

Loc. in SE corner SE SE sec. 16, T1S, R16E. Found in bottom of a water well which is 35' deep. The asphalt is in the nature of an aquifer.

(9)

27-2S-17E
SWSWSW
Pushmataha Co

Hydro Drlg 1 Ridley

Near Octavia fault
Asphaltic sd at c250', 305' + 333
above with lighter staining.

Rogers County.

E. G. Woodruff & C. L. Cooper. Oklahoma Geological Survey Bull. 40 U, 1928., pp. 281-282.

History of first drilling in Oklahoma as published by Paul S. Hedrick, Tulsa World, June 6, 1926. A blanket oil and gas lease made by Cherokee Nation in 1886 to Edward Byrd comprising 94,000 acres. Development did not start until summer of 1889 as approved by the Interior Department At Washington.

"The first well was drilled at this time on what was known as the Laura Taylor land, Sec. 5, T23N, R17E. on the S. prong of Spencer Creek to the W. of Chelsea. The drilling contractor was Sam E. Francis who used a horse power outfit and could not go very deep. This well was

completed August, 1889, at a depth of 36', and made ½ bbl. of fine green oil. A power house was put over the well and an upright boiler and engine to pump.

This well was drilled to test the oil spring known to almost every old Cherokee citizen. This spring was used for many years by the Indians before anyone thought about oil being worth anything, or was good for any purpose than for greasing an old wagon or for softening leather."

Further history is given of these early days and the drilling of several wells. It ends with just before Statehood (in 1907) the lease by Sec'y of Int., to the Cherokee Oil & Gas Co. of 12 sections of land.

The present compiler is interested mainly in the reference to the well known (in those days) oil spring in Sec. 5, T23N, R17E.

Rogers County.

Edward Bloesch. Nowata and Craig Counties. Oklahoma Geological Survey Bull. 40 ~~EE~~, 1928; p. 354.

"The first oil wells in this district were drilled in Sec. 32, T24N, R17E. in the Chelsea extension of the Coody's Bluff-Alluwe pool in Rogers County. It is said that an oil seep and showings in water led to the drilling, Real activity ~~in Sec. 5, T23N, R23E.~~, started in 1904 when it became possible to acquire valid leases."

(1)

EE p.

~~24N-16E~~ 16E

Rogers Co
Wingenow pool

Water flood in 13, 14, 15, 23, 24 8200 acres
Br. at 425 61 active oil wells

ROR Sec Rec. 1962, p. 323

Rogers County

Catale district + E Catale
24N-18E
Burgess sand 3-400'

Rogers County

Chelsea Field
Bartlesville 280-450 feet
35 feet to A63
Stray sd.

Parts of 24N, 16 and 17E

See p71-80, ROR Data on Sec. Rec 1962 ed.

See also OGS Bull 40 V. 1 p. 129

Sequoyah County
14 T.13N R23E

Oil seepage in St Clair Lime~~stone~~ Company mine ~~from~~ vugs and solution pockets in St Clair limestone on mine faces. Asphaltic residue along fractures

Pers. Com. R.L Rowland 10/1963

Sec. 6, T1S, R5W.

(1)

Name of Occurrence.
Location. Stephens County. $1\frac{1}{2}$ mi. N. W. of Arthur. SE$\frac{1}{4}$ Sec. 6, T1S, R5W. 12 mi. E. of Duncan.
Information Source. 6, p.33; 11, p.6; 12, p.160.

Material Described. Asphaltic impregnation along fault line in sandstone.
General Geology. The country rock is Permian SS. Fault N50W. Displacement 35'. Heavy petroleum percolated upward along plane of fault. Hutchison 6, p.33.
Commercial Development. Undeveloped.
Miscellaneous. Northwestward the fault deflected to the north changing into an anticlinal fold into T1N, R6W. In the SE portion of the latter along Wildhorse Creek

heavy oil is reported from domestic wells.

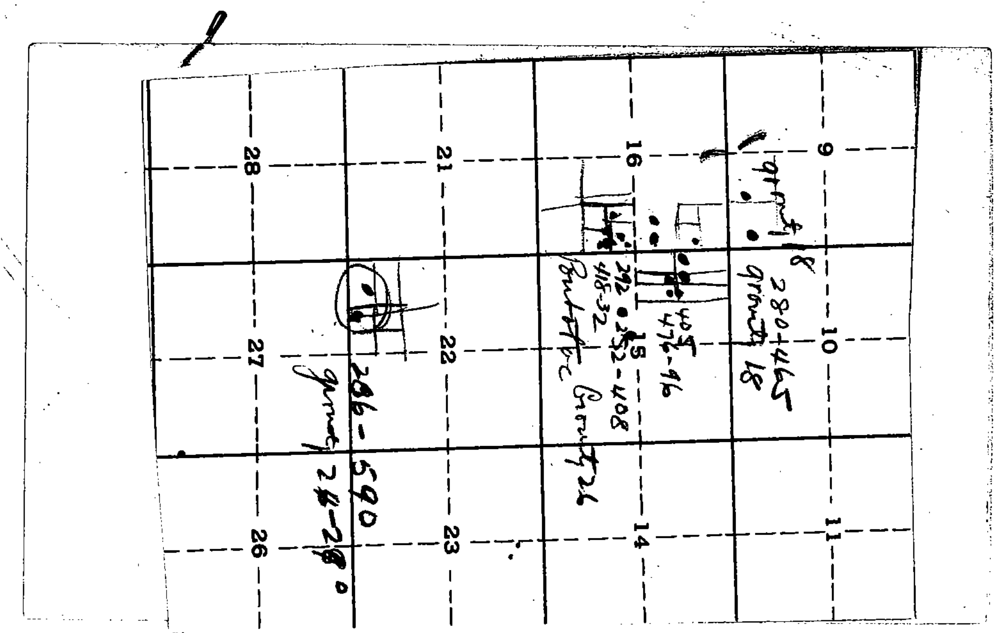
SW 9 E½ 16, W½ 15 + SWSW 22-1S-5W ✓
Stephens Co

Oil in wells Sho-vel-tum district
Depths 280 to 500' Gravity 18 to 29°.
Pontotoc pred.

In 22, 285-590' Grav 24-29

✓ On map over

R.O.R. cards



O.G.S. 2. Stephens County.

From the at present unpublished files of Okla. Geol. Surv. 2/8/44.

Sample 125-B (retest) Well in corner SW sec. 22, T1S, R5W.
Bitumen 1.6%
Penetration high.
Res. & Mins. same as above.
Too low in bitumen for use.

(2)

Lab. Test No. 96-D   Bitumen 15.3%
Penetration etc. same as above.

96-?   Bitumen 29.5%
Penetration medium
Others same as above.

NW SE Sec. 22, T1S, R5W. Estimated 5866 cu. yds. 6 samples along creek for $\frac{1}{4}$ mile, also indug well $\frac{1}{4}$ mile away.

(3) Lab Test No. 125-A   Bitumen 5.23%
Penetration high.
Res. quartz sand.
Mins. Asphalt quartz.

125-B   From well in corner SW of 22

(2)   Bitumen 4.55%
Penetration on very low.
Res. quartz sand
Mins. Asphalt, quartz.
Road topping material.

125-1   Bitumen 5.0%
Penetration high.
Res. quartz sand
Mins. Oil, asphalt, quartz.

Sec. 27, T1S., R5S.

(4)

Name of Occurrence. Sample No. 28 of 18, p. 25.
Location. Stephens County. E. side Sec. 27, T1S., R5W.
Information Source. 18, p. 25; Table of Tests, Sample 28.

Material Described.
General Geology. Permian
Commercial Development.
Miscellaneous. The above should be added to Shelley, 18, p. 25, shows Sample 28, Bitumen, 9.45%

Stephens county, Asphalt

Unpublished matter, Oklahoma Geological Survey, 2/8/44
Dup. S½ SE NE 27, T1S, R5W. Field Sheet No. 96--5 samples.
Informant G. D. Harmon, near resident.
Estimates 4444 Cu Yds., 3/4 mile, 2' overburden, outcrop in bed of creek. Deposit well worth development. Lab.

Test: No. 96-A. Bitumen 6.00%;
Penetration very low.
Res. quartz ~~and~~ sand.
Mins. Asphalt, quartz.

(4)

96-B. Bitumen 14.05%
Penetration very low.
Res. quartz sand
Mins. Oil, asphalt, quartz.

Only fair for road topping.

9-2S-4W
SE NW SW Twn
Stephens

Schermerhorn
#3 Heller
6/1964

Perf 56/(1160-74) acid, frac.

IP Pump 4 BO + 1.8 BSW /24
Gravity 12°

Not on OGS map.

6-2S-4W
C NE NW SE NW

Masters
2 Hermstoet

Oil sd @ 470, 514, 788, 832, 864

D+A.

Perforated @ all places

316

Sec. 6, T2S, R4W
(8)
(9)

<u>Name of Occurrence</u>. LeGrand Grahamite Mine.
<u>Location</u>. Stephens County. 3 mi. W. of Alma. NW¼ Sec. 6, T2S, R4W.
<u>Information Source</u>. 3, p. ; 4, p. 253; 6, pp. 33, 88. A 12, p. 252

<u>Material Described</u>. Grahamite, as a vein filling in SS. and shales
<u>General Geology</u>. Country rocks are sandstones and shales of Permian. See description in full by W. R. Crane, Jan. 1906.
<u>Commercial Development</u>. R. V. Legrande (possibly associated with W. A. Ledbetter) after burning of the Tar Springs plant in 25,3S, 4W. opened up the mine and operated it.

<u>Miscellaneous</u>. See full summary of report by W. R. Crane. The following briefly noted: Four shafts within ½ mile, from 60' to 100'. Vein filling in sandstones and shales. Fissure conditions. Pitch of veins 85 deg. Folding, lateral compression. Lenticular pockets from a few inches up to 12'. The deposit pinches out, but beyond are stringers. The formations dip 2 to E. of S. The asphalt extends more in the direction down the dip.

For further information on local conditions see following who are named by Wegemann in his report on the Loco Gas Field and the Duncan Gas Field.

Washita Gas & Fuel Co., M. M. Hightower, W. J. Collier, B. A. Barnes (Duncan), W. G. Skelly, Stephens Co., Oil & Development Co.

Following Hutchison quotation of W. R. Crane (1906) completes the grahamite mine story:

The formations containing the veins have a dip of about 2 deg. to the E. of S. which accounts for a still further distribution of asphalt through the surrounding strata. On the up, or N. side of the main vein the dissemination of the liquid asphalt does not extend more than several feet except in rare cases, while it may reach to a distance of ½ mile or more on the S. side or in the direction of the dip".

Abraham (1938, reference as above) repeats briefly the above description, and gives the following test:

Fracture	Hackly
Luster	Dull
Streak	Black
Fusing point (K&S method)	401-466 F.

Grahamite Mine. -4- (con't)

prevalent in this district. Displacements of only a few inches at the most, show the extent of faulting in the veins.

The pockets are roughly lenticular in shape and vary from a few inches up to 10' and 12', average 4', and range from 25' to 100' in both vertical and horizontal extent. At several points on the vein, at a depth of 100' or thereabouts, the deposit has pinched out entirely, as shown by shafts and other workings, this closing of the vein may be more or less abrupt, while at other points the deposit has maintained its thickness; in still other cases although the main body of the deposit has pinched out, yet it continues as stringers of which there may be quite a number, even as large as 1" in thickness. These stringers usually run out in the course of 10 to 20' ---

Grahamite Mine. -5- (con't)

Fixed carbon	34.4-39.4%
Sol. in CS_2	81.85-97.7%
Non-Mineral matter	0.10-3.6%
Free mineral matter (pyrites)	2.20-14.55%

Ben R. Belt. Field note book in files of Oklahoma Geological Survey presented to the present compiler 2/7/44 for his personal inspection. This is the old report referred to by Hutchison. Its date about 1909, thus:

Loc. a mine in NW Sec. 6, T2S, R4W on the N. B. Ivey land, the Grahamite Mining Co. A fault line, fine grained SS impregnated with grahamite, 10" thick, dip SW, fault hade 30 SW. The sand asphalt is poor in quality. The

vein was worked on the shaft plan.

Land owned by N. B. Sanner was leased by the Southwestern Oil & Asphalt Co. The mine was operated in 1903 by this Co. 108 carloads were taken out altogether. Shaft on the Rector land (adjoining) 100' on the Rector, 150' on the Sanner. The product sold for $13 to $15 per ton. The Grahamite Co. of Dallas has a 5 year lease beginning in 1906 on both of the tracts. Work was stopped on account of distance of haul to the RR.

N. B. Sanner land S½ NE of Sec. 6 (8)

Otto Rector land SW NE SE SE NW of sec. 6. (9)

Stephens County. (Dup.)

From the notes of the Oklahoma Geological Survey, furnished to the present compiler for his inspection personally.

S½ NE Sec. 6, T2S, R4W. Field Sheet 14- 1 sample (Grahamite) Owner is E. B. Cox, Ardmore, Estimated area of 2 acres. Six abandoned shafts. Some of the shafts are 158' deep. Great amount of grahamite. The Government demanded modernization of the mine, but instead the mine was abandoned. Used in pigment for paints. (9)

Lab. Tests, Sample 1. Bitumen 1.54%
Penetration very high
Res. Qtz sand 95%

N. B. Sanner Land
Mins. Qtz. small calcite, Oil.

Stephens County.

From the notes of the Oklahoma Geological Survey, furnished the present compiler for his personal inspection.

NE SW NW Sec. 14, T2S, R4W. Amount 6 cu. yds.
Field Sheet 12, Sample 1.

Lab. Test. Estimated 6 tons.
Bitumen 4.76%
Penetration high.
(10) Res. Qtz sand 98%
Mins. Quartz, asphalt.

Too high in oily matter.

Sec. 17 and 18, T2S, R4W

(11)

Name of Occurrence. Loco Gas Field District.
Location. Stephens County. Two occurrences NW SE SE¼ sec. 18, and SW SW¼ sec. 17, T2S, R4W.

Information Source. 14, pl 40.
Material Described. Asphaltic SS. lower bed at 2 point.
General Geology. This is on a secondary nosing mapped by Wegemann on surface geology.
Commercial Development.
Miscellaneous. For further information sources see:
Washita Gas & Fuel Co., MM. Hightower and W. J. Collier who are named in Wegemann report.

319

Sec. 29, T2S, R4W.

(12)

Name of Occurrence. Sample No. 29 of 18 p. 25.
Location. Stephens County. SE$\frac{1}{4}$ sec. 29, T2S, R4W.
Information Source. 18, p. 25, Table of Tests.

Material Described.
General Geology. In the Permian SS.
Commercial Development.
Miscellaneous Reference 18, p. 25, Bitumen 2.05%

Stephens County.

From the notes of the Oklahoma Geological Survey, furnished the present compiler for his personal inspection.
SW SW SW SW Sec. 31, T2S, R4W. Field Sheet 11-1 sample.

Lab. Test 1 Bitumen 0.20%
Res. qtz. sand.
Mins. Qtz. asphalt.

(13)

Too low in bitumen for commerce.
Amount 30 cu. ft.

Stephens County.

From field notes of Okla. Geol. Survey. Copy furnished to the present compiler 2/8/44 for his personal inspection.
Location E. Line of the NW$\frac{1}{4}$ sec. 6, T2S, R5W. An asphalt deposit. No further comment.

(5)

Stephens County.

The following is from the unpublished notes in files of the Okla. Geol. Survey. Handed to the present compiler for his personal information.

NW SW SE Sec. 27, T2S, R5W. O.G.S. Field Sheet 123 -- 1 sample, taken from dug well 40' deep. No test appears. Thickness 13'.

Included on map as sand asphalt. Evidence very meager.

(6)

Sec. 31, T2S, R5W.

(7)

Name of Occurrence. $5\frac{1}{2}$ mi. W. of Loco

Location. Stephens County. Two occurrences, one in SE $SW\frac{1}{4}$ and SW $SW\frac{1}{4}$ sec. 31, T2S, R5W.

Information Source. 14, p. 39. (1915)

Material Described. Both are exposures of asphaltic SS.

General Geology. These outcrops are on the flatter high point of general NW anticlinal structure of Wegemann. (1915)

Commercial Development.

Miscellaneous.

Stephens County. Dup. (14)

From field notes Oklahoma Geological Survey. Copy furnished the present compiler 2/8/44 for his personal inspection.

Field sheets No. 220 and 225.

Location NE NE Sec. 10, T3S, R5W. Asphalt base oil 22 Grav. found at 1020' capacity 6 bbls. day. Another asphalt show at 600'. No commercial value. Quoted here for the bearing of a deep seated oil seepage.

Omitted
L.G.

Secs. 10, 14, & 15
T3S, R5W.

(15)
(16)
(17)

Name of Occurrence. In Loco Gas Field. SW of Loco.
Location. Stephens County. Secs. 10, 14, & 15., T3S, R5W.
Information Source. Wegemann p.39. (1) The lower asphaltic SS. is exposed in NW ~~NE~~ SE ¼ sec. 14, T3S, R5W. (2&3) Tar in shallow wells. These and the asphalt SS. in sec. 14 are on high axis as shown by Wegemann, through Secs. 15 and 10.

SWNENE
10 - 3S - 5W
Stephens Co.
liquid asphalt.

FS 220-1
6 bbls daily
12.76° API

J.C. Taylor #1 Fee

1020' TD. 6 bbls daily
since 1914
10' of asphalt @ 600'

SE¼ 10-3S-5W
Stephens Co

Waterflood, 90 acres Depth 450'
at Loco field 28 oil wells active
Loco sand.

R.O.R. Sec. Rec. 1962, p. 202

In sec. 15-3S-5W, 200-900 feet

SWNW
NWSW
S½ NE
N½ SE
16-3S-5W
Stephens Co.

Waterford, Depth 430. Loco sand
11 oil wells.
5 oil wells - 500'

1962 R.O.R. Sec. Rec. p. 207

14-1N-4W
E/2 SE SE
Stephens Co.

Kingery #1 Edwards, 1942
SS 3650-3700 asphaltic shows
70-80° dip.
Also asphaltic @ 3810-28 "
blk oil at 3899-3917 " - X
Omit

16, 17, 20, 21 3S-4W
Stephens Co
Asphaltum Field.

Penn ss. - 1600'-sand
2100 Healdton sd.
Gravity 20-28°.
Cum. prod as of 11/1/62 814650.
since discovery in 1948
Omit

21-2S-4W
SWSENE
Stephens Co

Dillard #1 Harley
Pontotoc - 8 BOPD - 23° grav.
Depth 682 - 978 +20' thick.
Dillard #2 Harley (SESWSENE)
Pontotoc 8 BOPD, 22°
760-77.
Hartner #1 Kahle SENESWNE
Pontotoc 5 BOPD 21° grav.
647-979 17' thickness

Omit

12-3S-6W
SW Loco prospect
Stephens

Fairly low 18-29° gravity oils recovered
from sds 1300, 1700, 1800'
10' of Penn. sand

Omit

Tulsa

17, 18N, 12, 13E
Bixby-Jenks

Oil from Oswego @ 490'

Turkey Mt field
Oil from Big Lime @ 490

Omitted map

Scotts Yearbook

OKLAHOMA ASPHALT
Tulsa County.

Robert Galbreath, Personal interview, Jan. 20, 1944.
The above opened up the Glenn Pool in 1905 Prior to that he had been interested in developing near Red Fork, Tulsa Co. In 1903-1904 he had interested Driller, Chesley with him in going on to the Glenn land in SE$\frac{1}{4}$ Sec. 10- T. 17 N., R. 12 E. where he had already found a surface. His account is that with a sledge the men broke the outcropping limestone (probably Checkerboard Ls.) and found it saturated with oil and this led to the location of well and later on the Glenn Pool discovery.
The surface showing is said to be evident now. On this the present compiler makes no comment except that Mr. Galbreath is a reliable man. A journey will be made eventually to the locality by the compiler.

SW¼, N½SE, E½NE sec 3
+ NW NW sec 2
27N - 13E
Washington Co

North Dewey

Waterflood - Wayside 500 feet depth
18 active oil wells

R. O.R. Dist Sec. Rev. 1962
p. 119

SE¼ 10 - 27N - 13E
Washington Co.

Waterflood - Wayside 500 feet 40 acres
5 oil wells.

1962 R. O R. Sec. Rec. p. 309

325

13-7418-27N-14E

Weber pool

Washington Co

40 acres at above loc,
Wayside sand at 450'
24 wells

R.O.P. Sec. Reg 1962, p. 310
Also 2320 in Weber pool

Washington

26-27N, 13E
Bartlesville field

Prod from Dewey @ 260'
Scouts Year book

Omitted map