



GEOLOGICAL REPORT

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

License #: 0502001

UWI: 100/16-11-051-02W5/00

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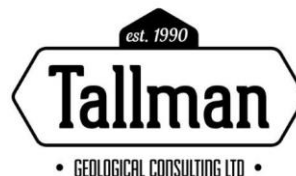


TABLE OF CONTENTS

TABLE OF CONTENTS..... 1

GENERAL WELL DATA.....2

GEOLOGICAL MARKERS..... 3

SAMPLE DESCRIPTIONS - BUILD & LATERAL 4

WELLPATH – LATERAL37

DRILLING SUMMARY 38

BIT RECORD 39

DAILY MUD PROPERTIES 39

SURVEYS – BUILD & LATERAL..... 40

SUMMARY 47

OPERATIONS 49

GENERAL WELL DATA

WELL NAME: Blackspur 100 HZ Leduc-WB 16-11-051-02W5

UNIQUE WELL ID: 100/16-11-051-02W5/00

PRIMARY OBJECTIVE: Mannville - Sparky

LICENSE NUMBER: 0502001

ELEVATIONS: Ground: 742.01 m
Kelly Bushing: 747.51 m

OPERATOR: Blackspur Oil Corp.

CONTRACTOR: Horizon #43

SPUD DATE: 2022/01/19-1600 hrs

KICK-OFF POINT: 1007.0 m MD **Date and Time:** 2022/01/21-1330 hrs

ICP: 1615.0 m MD **Date and Time:** 2022/01/22-1425 hrs

TOTAL DEPTH: 4088.0 m MD **Date and Time:** 2022/01/27-1220 hrs

HOLE SIZE: **Surface:** 349 mm
Vertical & Build: 222 mm
Lateral: 159 mm

SURFACE CASING: Ran 24 joints of 244.5 mm, 53.57 kg/m, J55 KSP Steel Casing.
Casing landed at 271.0 m. Total length of casing 271.88 m.
Plug down: 2022/01/20-0724 hrs. Drilled out: 2022/01/20-2325 hrs.

INTERMEDIATE CASING: Ran 131 joints of 177.8 mm, 32.23 kg/m, P110 BORUSAN Casing.
Casing landed at 1615.0 m. Total length of casing 1615.70 m.
Plug down: 2022/01/24-0145 hrs. Drilled out: 2022/01/24-1710 hrs.

MUD SYSTEM: Gel for 349 mm surface hole; Gel/Chem for 222 mm vertical hole;
Silicate for 222 mm build section; Polymer for 159 mm lateral section.

DITCH SAMPLES: Samples were described and vialled for Blackspur Oil Corp from 1300 m MD to TD and AER from 935.0 m MD to TD.

GEOLOGICAL MARKERS

K.B. ELEVATION: 747.5 m

STRATIGRAPHIC UNIT DRILLING EVENT	MEASURED DEPTH (m)	TRUE VERTICAL DEPTH (m)	MEAN SEA LEVEL (m)
COLORADO	873.0	873.0	-125.5
CARDIUM	983.2	983.0	-235.5
KOP	1007.0	1006.9	-259.4
SECOND WHITE SPECKS	1094.4	1093.2	-345.7
BASE FISH SCALES	1225.1	1210.0	-462.5
VIKING	1271.1	1245.5	-498.0
JOLI FOU	1322.1	1281.5	-534.0
MANNVILLE	1339.9	1292.0	-544.5
UPPER COAL	1283.1	1316.0	-568.5
TOP SPARKY B	1437.0	1337.7	-590.2
TOP SPARKY A	1468.0	1348.5	-601.0
MED RIVER COAL	1508.6	1358.2	-610.7
ICP	1615.0	1367.8	-620.3
TOTAL DEPTH	4088.0	1359.6	-612.1

SAMPLE DESCRIPTIONS - BUILD & LATERAL

<u>Interval</u>	<u>Lithology and Comments</u>
930 - 935	<u>Shale</u> (100%): medium to dark grey, black, mottled brown and black, grading to siltstone with common quartz grains, calcareous, argillaceous, minor disseminated pyrite, blocky, moderately indurated, no shows.
935 - 945	<u>Shale</u> (100%): medium to dark grey, black, mottled brown and black, grading to siltstone with common quartz grains, calcareous, argillaceous, minor disseminated pyrite, blocky, moderately indurated, no shows.
945 - 955	<u>Shale</u> (100%): medium to dark grey, black, mottled brown and black, grading to siltstone with common quartz grains, calcareous, argillaceous, minor disseminated pyrite, blocky, moderately indurated, no shows.
955 - 965	<u>Shale</u> (100%): medium to dark grey, black, mottled brown and black, grading to siltstone with common quartz grains, calcareous, argillaceous, minor disseminated pyrite, blocky, moderately indurated, no shows.
965 - 975	<u>Shale</u> (100%): medium to dark grey, black, mottled brown and black, grading to siltstone with common quartz grains, calcareous, argillaceous, minor disseminated pyrite, blocky, moderately indurated, no shows.
983.2	<u>Cardium</u> : 983.0 m TVD, -235.5 m SS
975 - 985	<u>Shale</u> (100%): medium grey to dark grey, minor light grey, slightly silty, blocky, rare nodular pyrite, rare light grey chert grains, no shows.
985 - 995	<u>Shale</u> (100%): medium grey to dark grey, minor light grey, slightly silty, blocky, rare nodular pyrite, rare light grey chert grains, no shows.
995 -1005	<u>Shale</u> (100%): medium grey to dark grey, minor light grey, slightly silty, blocky, rare nodular pyrite, rare light grey chert grains, no shows.
1007.0	<u>Kick Off Point</u> : 1006.9 m TVD, -259.4 m SS
1005 - 1015	<u>Shale</u> (100%): medium grey to dark grey, minor light grey, slightly silty, blocky, rare nodular pyrite, rare light grey chert grains, no shows.
1015 - 1025	<u>Shale</u> (95%): medium grey to dark grey, minor light grey, slightly silty, blocky, rare nodular pyrite, rare light grey chert grains, no shows; <u>Sandstone</u> (5%): mottled white and grey, trace mottled white and tan, very fine to fine lower, sub-angular, moderately sorted, calcareous cement, very poor intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1025 – 1035	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1035 - 1045	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1045 - 1055	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1055 - 1065	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1065 - 1075	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1075 - 1085	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1094.4	<u>Second White Specks</u> : 1093.2 m TVD, -345.7 m SS
1085 - 1095	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1095 – 1105	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1105 - 1115	<u>Shale</u> (100%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows.
1115 - 1125	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1125 - 1135	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1135 - 1145	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1145 - 1155	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1155 – 1165	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1165 – 1175	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1175 - 1185	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1185 - 1195	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1195 - 1205	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1205 - 1215	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1215 - 1225	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1225.1	<u>Base Fish Scales:</u> 1210.0 m TVD, -462.5 m SS
1225 - 1235	<u>Shale</u> (100%): medium grey to dark grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows;
1235 - 1245	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1245 - 1255	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1255 - 1265	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1271.1	<u>Viking:</u> 1245.5 m TVD, -498.0 m SS
1265 - 1275	<u>Shale</u> (95%): light to medium grey, minor dark grey, slightly silty, sub-fissile to fissile to sub-blocky, no shows; <u>Sandstone</u> (5%): white to off white, mottled white and light grey, quartz grains in a calcareous cement, trace glauconitic, very poor intergranular porosity, no shows.
1275 - 1285	<u>Sandstone</u> (90%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Shale</u> (10%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous, rare fossil fragments.
1285 - 1295	<u>Sandstone</u> (50%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Shale</u> (50%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous.

<u>Interval</u>	<u>Lithology and Comments</u>
1295 - 1305	<u>Sandstone</u> (50%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Shale</u> (50%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous.
1305 - 1315	<u>Sandstone</u> (50%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, occasional silty, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Shale</u> (50%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous.
1322.1	<u>Joli Fou</u> : 1281.5 m TVD, -534.0 m SS
1315 - 1325	<u>Shale</u> (60%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Sandstone</u> (40%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows.
1325 - 1335	<u>Shale</u> (80%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Siltstone</u> (20%): medium to dark grey, common argillaceous laminations, well consolidated trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.
1339.9	<u>Mannville</u> : 1292.0 m TVD, -544.5 m SS
1335 - 1345	<u>Shale</u> (80%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Siltstone</u> (20%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1345 - 1355	<u>Shale</u> (85%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Sandstone</u> (10%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Siltstone</u> (5%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.
1355 - 1365	<u>Shale</u> (85%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Sandstone</u> (10%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Siltstone</u> (5%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.
1365 - 1375	<u>Shale</u> (75%): light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, calcareous; <u>Sandstone</u> (20%): clear and translucent quartz, upper fine to lower medium grained, sub-angular to sub-rounded, moderately sorted, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, slightly argillaceous, trace light grey clay material, fair intergranular porosity, no shows; <u>Siltstone</u> (5%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.
1383.1	<u>Upper Coal</u> : 1316.0 m TVD, -568.5 m SS
1375 - 1385	<u>Sandstone</u> (70%): salt and pepper, white, light to medium grey, quartz grains in a calcareous cement, silt grading to lower very fine to fine upper, sub-angular, occasional sub-rounded, moderately sorted, poor intergranular porosity, no shows; <u>Shale</u> (20%), light to medium grey, occasional dark grey, sub-fissile, silty, trace disseminated pyrite, no shows; <u>Siltstone</u> (10%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1385 - 1390	<u>Coal</u> (50%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut; <u>Sandstone</u> (40%): white to salt and pepper, loose to moderately cemented quartz grains in a calcareous cement, fine to medium, sub-angular, occasional sub-rounded, moderately sorted, poor to fair intergranular porosity, no shows; <u>Siltstone</u> (10%): medium to dark grey, common argillaceous laminations, well consolidated, trace kaolinite, occasional unconsolidated, moderately well cemented with slightly calcareous to siliceous cement, trace light grey clay material, fair intergranular porosity, no shows.
1390 - 1395	<u>Sandstone</u> (80%): white to salt and pepper, loose to moderately cemented quartz grains in a calcareous cement, fine to medium, sub-angular, occasional sub-rounded, moderately sorted, poor to fair intergranular porosity, no shows; <u>Coal</u> (50%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut.
1395 - 1405	<u>Sandstone</u> (80%): white to salt and pepper, loose to moderately cemented quartz grains in a siliceous to slightly calcareous cement, fine to medium, sub-angular, occasional sub-rounded, moderately sorted, poor to fair intergranular porosity, no shows; <u>Coal</u> (20%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut.
1405 - 1415	<u>Shale</u> (90%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows; <u>Siltstone</u> (10%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.
1415 - 1425	<u>Siltstone</u> (70%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (30%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows.
1425 - 1435	<u>Siltstone</u> (70%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (30%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows.
1437.0	Sparky B: 1337.7 m TVD, -590.2 m SS
1435 - 1445	<u>Siltstone</u> (90%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (10%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1445 - 1455	<u>Sandstone</u> (50%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, patchy, yellow to light tan staining, no visible fluorescence or cut; <u>Siltstone</u> (40%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (10%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows.
1455 - 1465	<u>Siltstone</u> (60%): light tan to salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (30%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, patchy, yellow to light tan staining, no visible fluorescence or cut; <u>Shale</u> (10%): light to medium grey, slightly silty, sub-fissile to sub-blocky, calcareous, no shows.
1468.0	<u>Sparky A</u> : 1348.5 m TVD, -601.0 m SS
1465 - 1475	<u>Siltstone</u> (80%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (20%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, patchy, yellow to light tan staining, no visible fluorescence or cut.
1475 - 1490	<u>Siltstone</u> (80%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (20%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, patchy, yellow to light tan staining, no visible fluorescence or cut.

<u>Interval</u>	<u>Lithology and Comments</u>
1490 - 1495	<u>Siltstone</u> (70%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Coal</u> (20%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut; <u>Sandstone</u> (10%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, no shows
1495 - 1505	<u>Siltstone</u> (70%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Coal</u> (20%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut; <u>Sandstone</u> (10%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, no shows.
1508.6	<u>Med River Coal:</u> 1358.2 m TVD, -610.7 m SS
1505 - 1510	<u>Coal</u> (40%): black, vitreous, blocky, faint yellow fluorescence, slow, weak, yellow white fluorescent cut; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (30%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular to rare sub-rounded, moderately sorted, very poor intergranular porosity, no shows.
1510 - 1515	<u>Siltstone</u> (70%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (30%): light to medium grey, sub-fissile, silty, trace disseminated pyrite, firm, no shows.
1515 - 1530	<u>Siltstone</u> (70%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Shale</u> (30%): light to medium grey, sub-fissile, silty, trace disseminated pyrite, firm, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1530 - 1535	<u>Siltstone</u> (90%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (10%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, no shows.
1535 - 1545	<u>Siltstone</u> (80%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (20%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, no shows.
1545 - 1555	<u>Siltstone</u> (80%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (20%): light grey to mottled grey white and black, salt and pepper in part, very fine to fine, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, no shows.
1555 - 1565	<u>Siltstone</u> (80%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (20%): white and black, salt and pepper in part, mottled, minor cream to tan, trace green, fine to upper medium, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, questionable, light tan oil staining, no visible fluorescence or cut.

<u>Interval</u>	<u>Lithology and Comments</u>
1565 - 1580	<u>Sandstone</u> (50%): white and black, salt and pepper in part, mottled, minor cream to tan, trace green, fine to upper medium, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, questionable, light tan oil staining, no visible fluorescence or cut; <u>Siltstone</u> (50%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.
1580 - 1590	<u>Siltstone</u> (70%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows; <u>Sandstone</u> (30%): white and black, salt and pepper in part, mottled, minor cream to tan, trace green, fine to upper medium, predominately quartz grains, occasional glauconitic, occasional dark chert, moderately to well cemented in siliceous cement, occasional kaolinite, minor argillaceous inclusions, sub-angular, moderately sorted, very poor intergranular porosity, questionable, light tan oil staining, no visible fluorescence or cut.
1590 - 1600	<u>Sandstone</u> (70%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, fine lower to fine upper, occasional medium lower to medium upper, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconitic grains and dark lithics, rare chert, predominately sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.
1600 - 1615	<u>Sandstone</u> (70%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, fine lower to fine upper, occasional medium lower to medium upper, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconitic grains and dark lithics, rare chert, predominately sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1615.0	<u>Intermediate Casing Point:</u> 1367.8 m TVD, -620.3 m SS
1615 - 1640	<u>Sandstone</u> (70%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.
1640 - 1680	<u>Sandstone</u> (70%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows.
1680 - 1710	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1710 - 1740	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1740 - 1760	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.

<u>Interval</u>	<u>Lithology and Comments</u>
1760 - 1780	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1780 - 1800	Sandstone(100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1800 - 1820	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1820 - 1860	<u>Sandstone</u> (100%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows.
1865.0	<u>Med River Coal:</u> 1366.3 m TVD, -618.8 m SS
1860 - 1870	<u>Sandstone</u> (90%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, common unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows; <u>Coal</u> (10%): black, blocky, trace micromicaceous.

<u>Interval</u>	<u>Lithology and Comments</u>
1870 - 1890	<u>Sandstone</u> (70%): clear to light grey, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (30%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, trace spotty oil staining (5%) no cut.
1890 - 1910	<u>Sandstone</u> (80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows, spotty to even oil staining (10%) with instant brown white to yellow slightly streaming cut.
1910 - 1930	<u>Sandstone</u> (80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows, spotty to even oil staining (10%) with instant brown white to yellow slightly streaming cut.
1930 - 1950	<u>Sandstone</u> (80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows, spotty to even oil staining (10%) with instant brown white to yellow slightly streaming cut.

<u>Interval</u>	<u>Lithology and Comments</u>
1950 - 1970	<u>Sandstone</u> (80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; <u>Siltstone</u> (20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows, spotty to even oil staining (10%) with instant brown white to yellow slightly streaming cut.
1970 - 1990	<u>Sandstone</u> (80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, 5 to 10% tan to brown oil staining; <u>Siltstone</u> (20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, spotty to even oil staining (10%) with instant brown white to yellow slightly streaming cut.
1990 - 2000	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 30% tan to medium brown oil staining, spotty bright white fluorescence, immediate, cloudy, bright white fluorescent cut.
2000 - 2010	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 30% tan to medium brown oil staining, spotty bright white fluorescence, immediate, cloudy, bright white fluorescent cut.

<u>Interval</u>	<u>Lithology and Comments</u>
2010 - 2030	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 30% tan to medium brown oil staining, spotty bright white fluorescence, immediate, cloudy, bright white fluorescent cut.
2030 - 2040	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 40% tan to medium brown oil staining, spotty pale to bright yellow white fluorescence, fast to immediate, streaming to cloudy, bright white fluorescent cut.
2040 - 2060	<u>Sandstone</u> (80%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 30% tan to medium brown oil staining, spotty bright white fluorescence, immediate, cloudy, bright white fluorescent cut; <u>Shale</u> (20%): medium to dark grey, dark brown in part, grading to silt, slightly calcareous, blocky, well indurated, questionable shows.
2060 - 2080	<u>Sandstone</u> (90%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10 to 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, moderately to fast streaming, bright white fluorescent cut; <u>Shale</u> (10%): medium to dark grey, dark brown in part, grading to silt, slightly calcareous, blocky, well indurated, questionable shows.
2080 - 2100	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10 to 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.

<u>Interval</u>	<u>Lithology and Comments</u>
2100 - 2120	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.
2120 - 2140	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.
2140 - 2160	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, minor dark chert, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.
2160 - 2180	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional dark chert, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.
2180 - 2200	<u>Sandstone</u> (100%): clear to light grey, translucent in part, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.

<u>Interval</u>	<u>Lithology and Comments</u>
2200 - 2220	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut.
2220 - 2240	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut; common free oil on sample wash.
2240 - 2250	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut; common free oil on sample wash.
2250 - 2270	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut; common free oil on sample wash.
2270 - 2290	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast to immediate streaming, bright white fluorescent cut; common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2290 - 2310	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2310 - 2330	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2330 - 2350	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2350 - 2370	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 20% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2370 - 2390	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, moderately white fluorescent cut; common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2390 - 2410	<u>Sandstone</u> (100%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, moderately white fluorescent cut; common free oil on sample wash.
2410 - 2430	<u>Siltstone</u> (50%): medium grey, light grey in part, mottled grey brown and white, grading to lower very fine sand grains, predominantly quartz grains, common dark lithics, rare glauconite, argillaceous in part, sub-angular, well sorted, very poor intergranular porosity, questionable shows; <u>Sandstone</u> (50%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2430 - 2450	<u>Siltstone</u> (50%): medium grey, light grey in part, mottled grey brown and white, grading to lower very fine sand grains, predominantly quartz grains, common dark lithics, rare glauconite, argillaceous in part, sub-angular, well sorted, very poor intergranular porosity, questionable shows; <u>Sandstone</u> (50%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2450 - 2470	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2470 - 2490	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2490 - 2510	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2510 - 2530	<u>Siltstone</u> (50%): medium grey, light grey in part, mottled grey brown and white, grading to lower very fine sand grains, predominantly quartz grains, common dark lithics, rare glauconite, argillaceous in part, sub-angular, well sorted, very poor intergranular porosity, questionable shows; <u>Sandstone</u> (50%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2530 - 2550	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2550 - 2570	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2570 - 2590	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2590 - 2620	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2620 - 2640	<u>Siltstone</u> (50%): medium grey, light grey in part, mottled grey brown and white, grading to lower very fine sand grains, predominantly quartz grains, common dark lithics, rare glauconite, argillaceous in part, sub-angular, well sorted, very poor intergranular porosity, questionable shows; <u>Sandstone</u> (50%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2640 - 2670	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2670 - 2680	<u>Siltstone</u> (50%): medium grey, light grey in part, mottled grey brown and white, grading to lower very fine sand grains, predominantly quartz grains, common dark lithics, rare glauconite, argillaceous in part, sub-angular, well sorted, very poor intergranular porosity, questionable shows; <u>Sandstone</u> (50%): clear to light grey, translucent in part, mottled brown grey and white, minor tan to light brown, salt and pepper in part, minor black, predominantly quartz grains, occasional glauconite, predominantly unconsolidated, lower fine to upper fine, occasional medium, slightly siliceous to slightly dolomitic cemented, moderately to well sorted, sub-angular to sub-rounded, fair to good intergranular porosity, 10% tan to medium brown oil staining on quartz grains, spotty bright white fluorescence, fast streaming, bright white fluorescent cut; common free oil on sample wash.
2680 - 2700	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2700 - 2720	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2720 - 2740	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2740 - 2760	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2760 - 2780	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2780 - 2800	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2800 - 2820	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2820 - 2840	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2840 - 2860	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2860 - 2880	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2880 - 2920	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, occasional unconsolidated quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 20% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2920 - 2950	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, occasional unconsolidated quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 20% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2950 - 2970	<u>Sandstone</u> (100%): mottled brown and clear, clear, white, light grey, brown, occasional unconsolidated quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 20 to 30% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
2970 - 2990	<u>Sandstone</u> (100%): mottled brown and light grey, clear, white, light grey, brown, occasional unconsolidated quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 20 to 30% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
2990 - 3010	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3010 - 3040	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3040 - 3070	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3070 - 3090	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3090 - 3110	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 50% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3110 - 3130	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, common unconsolidated quartz grains, occasional in a siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair to good intergranular porosity, 50% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3130 - 3150	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 50% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash.
3150 - 3180	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.
3180 - 3200	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.
3200 - 3220	<u>Sandstone</u> (100%): medium brown, light grey, clear, white, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 40% light to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.
3220 - 3240	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 20 to 30% light to medium brown oil staining on grain edges, possibly washing off oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3240 - 3270	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 20 to 30% light to medium brown oil staining on grain edges, possibly washing off oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.
3270 - 3300	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, possibly washing off oil staining, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common free oil on sample wash.
3300 - 3330	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3330 - 3350	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3350 - 3380	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3380 - 3400	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3400 - 3420	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 30% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3420 - 3460	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 30% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3460 - 3480	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3480 - 3520	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, occasional unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.

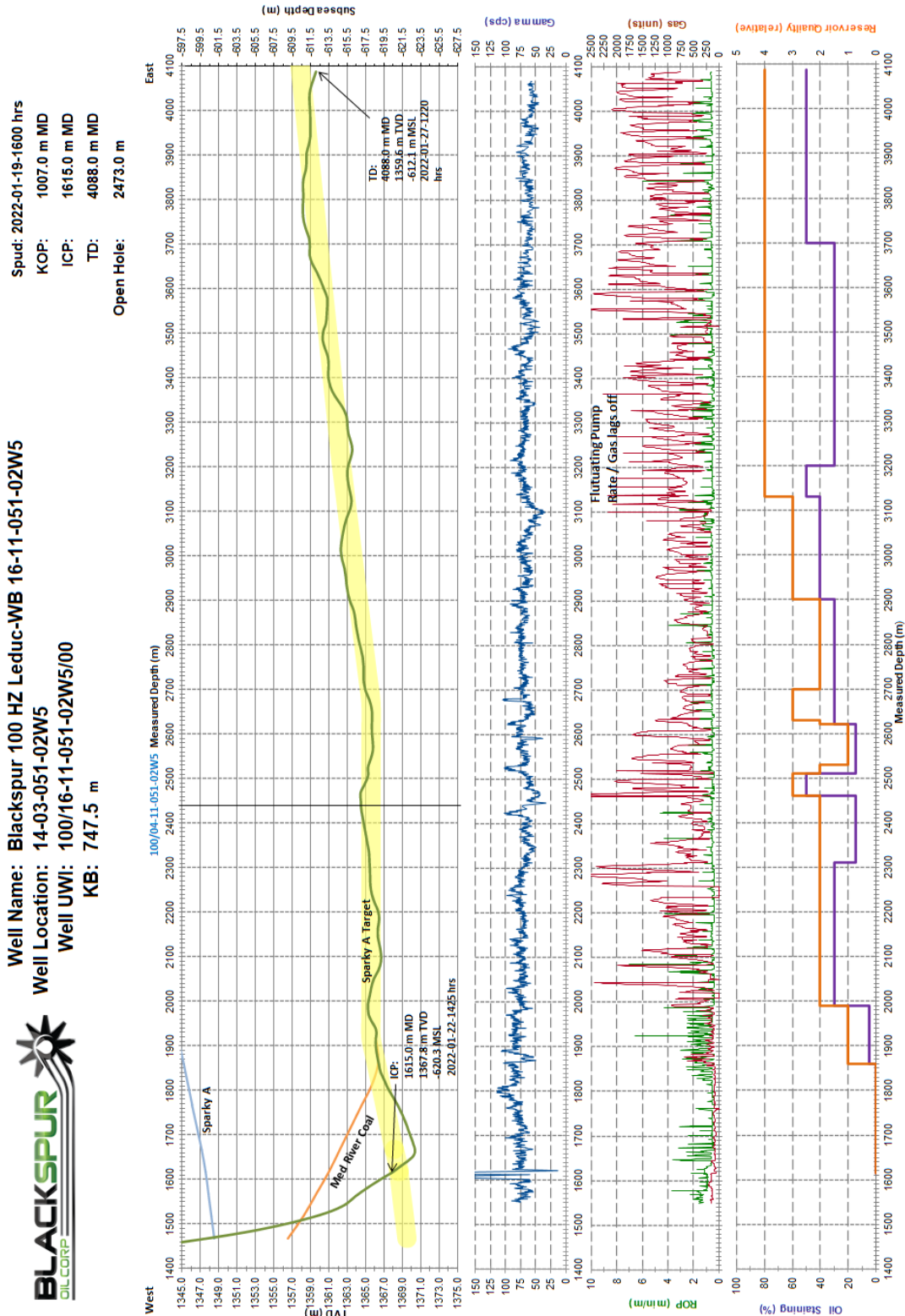
<u>Interval</u>	<u>Lithology and Comments</u>
3520 - 3540	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3540 - 3560	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3560 - 3580	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3580 - 3600	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3600 - 3640	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3640 - 3680	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3680 - 3720	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 10 to 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3720 - 3760	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3760 - 3800	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.
3800 - 3840	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 20% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, moderately to bright cloudy white fluorescent cut, common to abundant free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3840 - 3880	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
3880 - 3910	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
3910 - 3940	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
3940 - 3970	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.

<u>Interval</u>	<u>Lithology and Comments</u>
3970 - 3990	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
3990 - 4020	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
4020 - 4050	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
4050 - 4088	<u>Sandstone</u> (100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash.
4088.0	<u>Total Depth:</u> 1359.6, -612.1 m SS

WELLPATH – LATERAL



DRILLING SUMMARY

DATE	DEPTH m 2400 hrs	24 hr Progress	RATE m/hr	ROTATING HOURS	24 Hr ACTIVITY
2022-01-18	0.0	0.0	0.0	0.0	Rig move, Rig up, Pre-spud meeting.
2022-01-19	271.0	271.0	98.5	2.75	Rig up. Drill 349.0 mm surface hole from 0.0 – 271.0 m MD.
2022-01-20	300.0	29.0	58.0	0.50	Back ream, run casing, cement, WOC. Drill 222 mm vertical section from 271.0 – 300.0 m MD.
2022-01-21	1292.0	992.0	79.4	12.50	Drill 222 mm vertical section from 300.0 – 1007.0 m MD. Drill 222 mm Build section from 1007.0 – 1292.0 m MD.
2022-01-22	1615.0	323.0	38.0	8.50	Drill 222 mm Build section from 1292.0 – 1615.0 m MD (ICP). Back ream. Trip in hole.
2022-01-23	1615.0	0.0	0.0	0.0	Wiper Trip. Lay down directional tools. Rig up and run intermediate casing.
2022-01-24	1865.0	250.0	62.5	4.00	Cement. WOC. RIH. Drill & survey 159.0 mm lateral section from 1615.0 – 1865.0 m MD.
2022-01-25	2770.0	905.0	71.0	12.75	Drill & survey 159.0 mm lateral section from 1865.0 – 2770.0 m MD.
2022-01-26	3651.0	881.0	82.0	10.75	Drill & survey 159.0 mm lateral section from 2770.0 – 3651.0 m MD.
2022-01-27	4088.0	437.0	76.0	5.75	Drill & survey 159.0 mm lateral section from 3651.0 – 4088.0 m MD.

TOTAL ROTATING HOURS: 57.50 hrs

BIT RECORD

BIT #	MAKE	TYPE	SIZE mm	DEPTH IN	DEPTH OUT	DRILLED	HOURS
1	Drilformance	DF519XM	349.0	0.0	271.0	271.0	2.75
2	Haliburton	GTD54RM	222.0	271.0	1615.0	1344.0	21.25
3	Reed	TKC63-B1	159.0	1615.0	4088.0	2473.0	31.50

DAILY MUD PROPERTIES

DATE	DEPTH(m MD)	DENSITY (kg/m ³)	VISCOSITY (s/L)	WATER LOSS (mL/30 sec)	FILTER CAKE (mm)	pH	Chlorides/ Calcium (mg/L)
2022-01-19	271.0	1090	82.0	-	-	-	-
2022-01-20	-	-	-	-	-	-	-
2022-01-21	816.0	1050	30	-	-	-	-
2022-01-22	1446.0	1060	48.0	6.0	-	2.0	-
2022-01-23	1615.0	1060	78.0	6.0	-	12.0	-
2022-01-24	1615.0	1000	36.0	-	-	-	-
2022-01-25	2109.0	1060	36.0	5.0	-	9.0	-
2022-01-26	3032.0	1100	42.0	7.5	-	9.0	-
2022-01-27	3937.0	1070	35.0	15.0	-	7.0	-

SURVEYS – BUILD & LATERAL

MD	Inc	Azi	TVD	NS	EW	VS	DLS	BR
m	°	°	m	m	m	m	(°/30 m)	(°/30 m)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.21	0.00	0.00	0.21	0.00	0.00	0.00		
2.51	0.00	0.00	2.51	0.00	0.00	0.00		
5.50	0.00	0.00	5.50	0.00	0.00	0.00	0.00	0.00
36.32	0.40	72.60	36.32	0.03	0.10	0.10	0.39	0.39
58.62	1.00	42.50	58.62	0.20	0.31	0.37	0.92	0.81
77.95	1.20	52.00	77.94	0.45	0.58	0.73	0.42	0.31
96.80	1.50	47.50	96.79	0.74	0.92	1.17	0.51	0.48
115.68	1.80	48.90	115.66	1.10	1.32	1.71	0.48	0.48
134.56	1.00	58.10	134.54	1.38	1.69	2.16	1.32	-1.27
153.68	0.90	34.70	153.65	1.59	1.92	2.47	0.62	-0.16
172.60	0.90	67.80	172.57	1.77	2.14	2.75	0.81	0.00
191.58	0.40	333.70	191.55	1.89	2.25	2.90	1.60	-0.79
210.62	0.80	294.30	210.59	2.00	2.10	2.84	0.87	0.63
229.59	1.30	304.30	229.56	2.18	1.80	2.68	0.84	0.79
248.50	1.20	301.50	248.46	2.40	1.45	2.50	0.19	-0.16
254.00	1.20	302.40	253.96	2.46	1.35	2.45	0.10	0.00
271.00	1.20	297.90	270.96	2.64	1.05	2.28	0.17	0.00
288.40	1.20	293.30	288.35	2.80	0.72	2.09	0.17	0.00
345.42	0.80	293.40	345.36	3.19	-0.20	1.52	0.21	-0.21
402.33	0.30	207.10	402.27	3.22	-0.63	1.17	0.44	-0.26
459.25	0.30	101.80	459.19	3.05	-0.55	1.15	0.25	0.00
516.39	0.60	178.40	516.33	2.72	-0.40	1.10	0.32	0.16
573.24	0.90	241.20	573.18	2.21	-0.78	0.51	0.43	0.16
630.06	1.00	243.40	629.99	1.77	-1.61	-0.43	0.06	0.05
687.16	0.70	274.00	687.08	1.58	-2.41	-1.21	0.28	-0.16
744.19	0.30	220.20	744.11	1.49	-2.85	-1.63	0.30	-0.21
801.31	0.50	21.50	801.23	1.60	-2.86	-1.58	0.41	0.11
858.15	0.20	107.90	858.07	1.80	-2.67	-1.31	0.28	-0.16
915.15	0.30	214.20	915.07	1.65	-2.66	-1.39	0.21	0.05
971.98	0.40	226.30	971.90	1.39	-2.89	-1.72	0.07	0.05
990.96	0.10	159.60	990.88	1.33	-2.93	-1.78	0.59	-0.47
1000.54	0.40	247.10	1000.46	1.31	-2.96	-1.82	1.28	0.94
1006.00	0.35	75.97	1005.92	1.30	-2.96	-1.82	4.11	-0.27
1009.99	0.90	73.10	1009.91	1.32	-2.92	-1.78	4.14	4.14
1015.86	2.26	75.46	1015.86	1.36	-2.76	-1.62		
1019.47	3.10	75.88	1019.38	1.40	-2.60	-1.46	6.97	6.96
1028.95	5.30	72.30	1028.83	1.60	-1.93	-0.79	7.01	6.96

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
1038.53	6.80	73.90	1038.36	1.89	-0.96	0.18	4.73	4.70
1048.01	8.00	75.50	1047.76	2.21	0.21	1.35	3.85	3.80
1057.44	8.70	79.80	1057.09	2.50	1.55	2.64	2.98	2.23
1066.91	9.50	88.10	1066.44	2.65	3.04	3.98	4.86	2.53
1076.53	10.60	88.30	1075.91	2.70	4.71	5.43	3.43	3.43
1086.19	12.00	81.70	1085.39	2.88	6.60	7.12	5.91	4.35
1095.70	13.50	82.30	1094.66	3.17	8.68	9.04	4.75	4.73
1105.16	14.60	81.80	1103.84	3.49	10.95	11.14	3.51	3.49
1114.65	16.20	85.80	1112.99	3.75	13.45	13.40	6.07	5.06
1124.19	19.50	85.20	1122.07	3.98	16.37	16.00	10.39	10.38
1133.70	22.00	85.10	1130.96	4.27	19.73	19.00	7.89	7.89
1143.20	24.50	80.20	1139.69	4.76	23.44	22.41	9.98	7.89
1152.83	26.20	76.40	1148.39	5.60	27.47	26.28	7.33	5.30
1162.35	27.40	75.80	1156.89	6.63	31.64	30.36	3.88	3.78
1171.82	28.60	74.70	1165.25	7.76	35.94	34.61	4.14	3.80
1181.30	30.00	76.90	1173.52	8.90	40.44	39.02	5.59	4.43
1190.77	31.90	78.50	1181.64	9.93	45.20	43.61	6.56	6.02
1200.25	33.20	82.30	1189.63	10.78	50.22	48.32	7.67	4.11
1209.70	34.30	87.10	1197.49	11.26	55.45	53.01	9.16	3.49
1219.26	35.70	91.30	1205.32	11.33	60.93	57.70	8.74	4.39
1228.73	37.20	92.60	1212.94	11.14	66.55	62.37	5.34	4.75
1238.23	38.20	91.80	1220.46	10.92	72.35	67.18	3.52	3.16
1247.72	39.50	91.80	1227.85	10.73	78.30	72.13	4.11	4.11
1257.30	40.80	92.60	1235.17	10.49	84.48	77.25	4.38	4.07
1266.78	42.70	90.60	1242.24	10.32	90.79	82.51	7.34	6.01
1276.27	43.40	89.00	1249.18	10.34	97.26	88.02	4.10	2.21
1285.75	44.90	87.10	1255.98	10.57	103.86	93.74	6.33	4.75
1295.22	46.60	87.10	1262.59	10.91	110.64	99.67	5.39	5.39
1304.87	48.50	87.40	1269.10	11.25	117.75	105.88	5.95	5.91
1314.34	48.00	87.00	1275.41	11.60	124.81	112.06	1.84	-1.58
1324.00	48.50	87.10	1281.84	11.97	132.00	118.36	1.57	1.55
1333.45	49.10	87.00	1288.06	12.33	139.10	124.58	1.92	1.90
1342.94	50.80	86.80	1294.17	12.73	146.36	130.94	5.40	5.37
1352.54	54.00	86.60	1300.03	13.17	153.95	137.62	10.01	10.00
1362.01	57.80	86.90	1305.33	13.61	161.78	144.50	12.06	12.04
1371.60	60.00	87.30	1310.29	14.03	169.98	151.68	6.97	6.88
1381.16	61.20	88.20	1314.98	14.35	178.30	158.91	4.50	3.77
1390.65	62.50	88.00	1319.46	14.63	186.66	166.16	4.15	4.11
1400.13	65.00	88.10	1323.65	14.92	195.16	173.52	7.92	7.91
1409.61	66.60	87.60	1327.54	15.24	203.80	181.03	5.26	5.06

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
1419.06	67.70	88.00	1331.21	15.58	212.50	188.59	3.68	3.49
1428.52	69.30	88.20	1334.67	15.87	221.30	196.21	5.11	5.07
1431.00	69.54	88.02	1335.54	15.95	223.62	198.22	3.55	2.90
1435.84	70.00	87.66	1338.90	16.12	228.16	202.16		
1437.98	70.20	87.50	1337.95	16.20	230.17	203.91	3.53	2.84
1447.41	69.80	87.70	1341.17	16.57	239.02	211.62	1.41	-1.27
1456.90	69.60	87.40	1344.46	16.95	247.91	219.37	1.09	-0.63
1463.00	70.37	87.85	1346.55	17.19	253.64	224.35	4.32	3.79
1463.38	70.42	87.88	1346.62	17.20	254.00	224.66		
1466.34	70.80	88.10	1347.66	17.30	256.79	227.09	4.40	3.86
1475.84	73.40	87.30	1350.58	17.67	265.82	234.94	8.56	8.21
1485.33	75.50	87.40	1353.13	18.09	274.95	242.92	6.65	6.64
1494.99	77.30	87.80	1355.40	18.48	284.33	251.09	5.72	5.59
1504.47	78.60	87.60	1357.38	18.85	293.60	259.14	4.16	4.11
1513.92	79.90	88.20	1359.14	19.19	302.87	267.20	4.53	4.13
1523.42	81.90	88.70	1360.64	19.45	312.25	275.29	6.51	6.32
1532.90	83.70	88.80	1361.83	19.65	321.65	283.38	5.70	5.70
1542.47	85.30	89.00	1362.75	19.83	331.18	291.56	5.05	5.02
1552.00	87.40	88.60	1363.35	20.03	340.68	299.73	6.73	6.61
1561.72	86.20	87.90	1363.90	20.33	350.39	308.12	4.29	-3.70
1562.54	86.19	87.88	1365.25	20.36	351.20	308.83		
1571.24	86.10	87.70	1364.53	20.69	359.88	316.37	0.70	-0.32
1580.70	85.80	87.40	1365.20	21.10	369.30	324.59	1.34	-0.95
1590.17	85.70	87.50	1365.90	21.52	378.74	332.81	0.45	-0.32
1599.00	85.40	87.20	1366.59	21.93	387.53	340.49	1.44	-1.02
1615.00	85.80	87.60	1367.82	22.65	403.47	354.40	1.06	0.75
1625.00	86.06	87.86	1368.67	23.04	413.44	363.07		
1630.43	86.20	88.00	1368.89	23.24	418.85	367.77	1.10	0.78
1640.03	86.00	87.30	1369.55	23.63	428.42	376.10	2.27	-0.63
1648.00	87.36	87.13	1369.60	24.02	436.37	383.04		
1649.43	87.60	87.10	1370.07	24.09	437.79	384.29	5.15	5.11
1659.03	89.20	87.40	1370.34	24.55	447.38	392.67	5.09	5.00
1668.49	90.90	87.50	1370.33	24.97	456.83	400.92	5.40	5.39
1677.99	90.80	87.20	1370.19	25.41	466.32	409.20	1.00	-0.32
1687.48	91.00	86.60	1370.04	25.92	475.79	417.51	2.00	0.63
1697.08	91.20	86.80	1369.86	26.48	485.37	425.94	0.88	0.63
1706.58	90.80	86.70	1369.69	27.02	494.86	434.27	1.30	-1.26
1725.19	91.19	86.11	1364.35	28.18	513.43	450.65		
1725.56	91.20	86.10	1369.36	28.21	513.80	450.98	1.14	0.63
1744.49	91.10	85.30	1368.98	29.63	532.67	467.74	1.28	-0.16

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
1763.49	91.60	86.80	1368.53	30.93	551.62	484.52	2.50	0.79
1782.44	91.60	86.70	1368.00	32.01	570.53	501.14	0.16	0.00
1801.51	91.60	86.90	1367.47	33.07	589.56	517.85	0.31	0.00
1811.00	91.10	86.60	1367.25	33.61	599.04	526.18	1.84	-1.58
1820.46	91.30	86.80	1367.05	34.16	608.48	534.48	0.90	0.63
1830.04	91.40	85.30	1366.82	34.81	618.03	542.93	4.71	0.31
1839.54	91.10	83.70	1366.62	35.73	627.49	551.44	5.14	-0.95
1849.19	90.40	82.00	1366.49	36.93	637.06	560.20	5.72	-2.18
1858.68	90.50	80.00	1366.41	38.41	646.43	568.94	6.33	0.32
1868.18	90.70	77.70	1366.32	40.25	655.75	577.82	7.29	0.63
1877.69	90.40	76.10	1366.22	42.40	665.01	586.82	5.14	-0.95
1887.16	90.50	73.40	1366.15	44.89	674.15	595.89	8.56	0.32
1896.65	90.10	71.70	1366.10	47.74	683.20	605.08	5.52	-1.26
1906.32	90.20	69.40	1366.07	50.96	692.32	614.52	7.14	0.31
1915.77	89.60	67.50	1366.09	54.43	701.11	623.81	6.33	-1.90
1925.35	89.80	65.60	1366.14	58.24	709.90	633.29	5.98	0.63
1934.94	90.50	63.90	1366.12	62.33	718.57	642.81	5.75	2.19
1944.34	91.80	62.00	1365.93	66.61	726.94	652.18	7.35	4.15
1951.51	91.73	60.51	1365.40	70.05	733.22	659.33		
1953.98	91.70	60.00	1365.63	71.28	735.37	661.80	6.23	-0.31
1963.65	91.00	57.90	1365.41	76.26	743.65	671.46	6.87	-2.17
1968.57	90.74	57.23	1365.51	78.90	747.80	676.38		
1973.13	90.50	56.60	1365.28	81.39	751.62	680.94	4.41	-1.58
1992.34	89.80	54.00	1365.23	92.33	767.41	700.13	4.20	-1.09
2011.43	89.10	53.90	1365.41	103.56	782.85	719.17	1.11	-1.10
2030.49	89.80	52.20	1365.60	115.02	798.08	738.15	2.89	1.10
2049.59	88.60	50.90	1365.86	126.89	813.03	757.13	2.78	-1.88
2068.76	88.40	50.00	1366.37	139.09	827.81	776.12	1.44	-0.31
2087.82	89.90	50.20	1366.65	151.32	842.43	794.99	2.38	2.36
2106.78	90.10	49.50	1366.65	163.54	856.92	813.76	1.15	0.32
2125.72	90.90	51.20	1366.48	175.63	871.50	832.53	2.98	1.27
2144.66	90.20	51.20	1366.30	187.49	886.26	851.33	1.11	-1.11
2163.82	89.70	50.70	1366.32	199.57	901.14	870.34	1.11	-0.78
2182.88	89.50	50.80	1366.45	211.62	915.90	889.25	0.35	-0.31
2201.87	91.20	50.20	1366.34	223.70	930.55	908.07	2.85	2.69
2221.09	91.10	49.90	1365.95	236.04	945.29	927.10	0.49	-0.16
2240.14	90.70	50.50	1365.65	248.23	959.92	945.97	1.14	-0.63
2259.13	90.20	50.40	1365.50	260.33	974.56	964.79	0.81	-0.79
2278.18	90.00	50.20	1365.47	272.49	989.22	983.66	0.45	-0.31
2297.15	90.20	50.20	1365.43	284.64	1003.79	1002.45	0.32	0.32

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
2316.22	90.10	49.60	1365.38	296.92	1018.38	1021.33	0.96	-0.16
2335.11	90.20	49.30	1365.34	309.20	1032.73	1040.01	0.50	0.16
2354.15	90.80	48.60	1365.17	321.70	1047.09	1058.80	1.45	0.95
2373.12	90.20	49.30	1365.00	334.16	1061.40	1077.53	1.46	-0.95
2392.01	90.80	49.20	1364.84	346.49	1075.71	1096.20	0.97	0.95
2411.06	91.20	49.30	1364.51	358.92	1090.14	1115.02	0.65	0.63
2430.03	90.20	49.90	1364.27	371.22	1104.58	1133.78	1.84	-1.58
2449.13	90.10	51.20	1364.22	383.35	1119.33	1152.72	2.05	-0.16
2467.98	88.70	50.80	1364.42	395.22	1133.98	1171.42	2.32	-2.23
2487.10	88.60	50.60	1364.87	407.32	1148.77	1190.38	0.35	-0.16
2506.21	89.90	50.70	1365.12	419.44	1163.54	1209.33	2.05	2.04
2525.18	89.40	50.80	1365.24	431.44	1178.23	1228.14	0.81	-0.79
2544.19	88.80	51.00	1365.54	443.43	1192.99	1247.00	1.00	-0.95
2563.14	89.80	49.80	1365.77	455.51	1207.58	1265.78	2.47	1.58
2582.26	90.30	49.00	1365.75	467.95	1222.10	1284.68	1.48	0.78
2601.41	90.20	49.60	1365.67	480.44	1236.62	1303.61	0.95	-0.16
2620.51	89.90	50.00	1365.65	492.76	1251.21	1322.51	0.79	-0.47
2639.57	89.90	49.00	1365.68	505.14	1265.70	1341.36	1.57	0.00
2658.70	90.50	47.80	1365.62	517.84	1280.01	1360.21	2.10	0.94
2677.63	91.10	48.10	1365.35	530.52	1294.06	1378.85	1.06	0.95
2696.54	91.20	48.70	1364.97	543.07	1308.20	1397.48	0.96	0.16
2715.60	90.00	47.90	1364.77	555.75	1322.43	1416.27	2.27	-1.89
2734.54	90.20	48.40	1364.74	568.39	1336.54	1434.92	0.85	0.32
2753.47	89.80	48.50	1364.74	580.94	1350.70	1453.59	0.65	-0.63
2772.44	90.70	48.40	1364.66	593.53	1364.90	1472.29	1.43	1.42
2791.58	90.50	48.50	1364.46	606.22	1379.22	1491.16	0.35	-0.31
2810.66	90.90	48.60	1364.23	618.85	1393.52	1509.98	0.65	0.63
2829.75	90.20	48.50	1364.04	631.49	1407.83	1528.80	1.11	-1.10
2848.70	90.70	49.20	1363.89	643.95	1422.10	1547.51	1.36	0.79
2858.17	89.90	49.00	1363.84	650.16	1429.26	1556.86	2.61	-2.53
2877.02	91.10	50.00	1363.68	662.40	1443.59	1575.50	2.49	1.91
2895.88	91.10	50.30	1363.32	674.48	1458.07	1594.17	0.48	0.00
2914.76	90.50	49.90	1363.05	686.59	1472.55	1612.87	1.15	-0.95
2933.88	90.40	49.70	1362.90	698.93	1487.15	1631.79	0.35	-0.16
2952.80	90.10	49.60	1362.82	711.18	1501.57	1650.51	0.50	-0.48
2971.78	90.80	49.50	1362.67	723.49	1516.01	1669.28	1.12	1.11
2990.82	90.70	50.00	1362.42	735.79	1530.55	1688.11	0.80	-0.16
3009.79	90.10	50.20	1362.29	747.96	1545.10	1706.90	1.00	-0.95
3028.75	89.70	50.10	1362.32	760.11	1559.65	1725.68	0.65	-0.63
3047.71	89.40	50.40	1362.47	772.23	1574.23	1744.46	0.67	-0.47

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
3066.65	89.50	51.30	1362.65	784.19	1588.92	1763.25	1.43	0.16
3085.61	88.90	50.90	1362.92	796.10	1603.67	1782.07	1.14	-0.95
3104.61	88.90	49.90	1363.28	808.20	1618.31	1800.90	1.58	0.00
3123.54	90.20	50.10	1363.43	820.37	1632.81	1819.64	2.08	2.06
3142.54	90.70	50.30	1363.28	832.53	1647.41	1838.46	0.85	0.79
3161.57	90.40	50.20	1363.10	844.70	1662.04	1857.31	0.50	-0.47
3180.56	90.30	50.40	1362.98	856.83	1676.65	1876.13	0.35	-0.16
3199.67	89.40	50.10	1363.03	869.05	1691.34	1895.06	1.49	-1.41
3218.55	88.80	49.50	1363.33	881.24	1705.76	1913.74	1.35	-0.95
3237.47	90.00	48.80	1363.53	893.61	1720.07	1932.43	2.20	1.90
3256.45	91.00	48.60	1363.36	906.14	1734.33	1951.15	1.61	1.58
3275.45	90.70	48.40	1363.08	918.72	1748.56	1969.89	0.57	-0.47
3294.39	89.90	48.50	1362.98	931.29	1762.73	1988.56	1.28	-1.27
3313.56	90.60	47.90	1362.90	944.06	1777.02	2007.45	1.44	1.10
3332.55	91.80	47.90	1362.50	956.79	1791.11	2026.13	1.90	1.90
3351.53	92.00	48.90	1361.87	969.39	1805.29	2044.83	1.61	0.32
3370.46	91.30	49.00	1361.33	981.81	1819.56	2063.52	1.12	-1.11
3389.36	90.60	49.10	1361.01	994.20	1833.83	2082.18	1.12	-1.11
3408.38	90.10	49.20	1360.90	1006.64	1848.22	2100.97	0.80	-0.79
3427.28	89.60	49.30	1360.95	1018.98	1862.54	2119.65	0.81	-0.79
3446.26	90.80	49.40	1360.88	1031.34	1876.94	2138.41	1.90	1.90
3465.20	91.10	49.50	1360.57	1043.65	1891.33	2157.13	0.50	0.48
3484.13	90.50	49.30	1360.30	1055.97	1905.70	2175.84	1.00	-0.95
3503.31	89.20	47.70	1360.35	1068.68	1920.06	2194.75	3.22	-2.03
3522.30	89.00	46.20	1360.65	1081.64	1933.94	2213.38	2.39	-0.32
3541.25	90.50	47.10	1360.73	1094.65	1947.72	2231.96	2.77	2.37
3560.51	89.20	46.90	1360.78	1107.78	1961.80	2250.86	2.05	-2.02
3579.79	90.70	48.10	1360.80	1120.81	1976.02	2269.81	2.99	2.33
3598.97	91.40	49.10	1360.45	1133.49	1990.40	2288.73	1.91	1.09
3617.99	90.80	49.40	1360.08	1145.90	2004.81	2307.52	1.06	-0.95
3637.17	91.70	50.10	1359.67	1158.29	2019.44	2326.49	1.78	1.41
3656.33	91.30	50.60	1359.16	1170.51	2034.19	2345.47	1.00	-0.63
3675.45	90.40	50.60	1358.88	1182.65	2048.96	2364.43	1.41	-1.41
3694.58	89.50	50.40	1358.90	1194.81	2063.72	2383.39	1.45	-1.41
3713.56	91.00	51.00	1358.81	1206.84	2078.41	2402.21	2.55	2.37
3732.62	90.90	50.20	1358.50	1218.93	2093.14	2421.11	1.27	-0.16
3751.58	90.70	50.00	1358.23	1231.09	2107.68	2439.88	0.45	-0.32
3770.57	89.90	49.50	1358.13	1243.36	2122.18	2458.67	1.49	-1.26
3789.54	89.80	49.50	1358.18	1255.68	2136.60	2477.43	0.16	-0.16
3808.54	90.10	49.00	1358.20	1268.08	2150.99	2496.21	0.92	0.47

Blackspur 100 HZ Leduc-WB 16-11-051-02W5

MD m	Inc °	Azi °	TVD m	NS m	EW m	VS m	DLS (°/30 m)	BR (°/30 m)
3827.62	90.20	50.20	1358.15	1280.45	2165.52	2515.08	1.89	0.16
3846.78	89.50	49.30	1358.20	1292.83	2180.15	2534.03	1.79	-1.10
3865.75	89.00	49.00	1358.45	1305.24	2194.49	2552.77	0.92	-0.79
3884.91	90.50	47.80	1358.53	1317.96	2208.82	2571.66	3.01	2.35
3903.99	89.70	47.60	1358.50	1330.80	2222.93	2590.43	1.30	-1.26
3923.03	88.80	47.20	1358.75	1343.68	2236.95	2609.14	1.55	-1.42
3942.01	90.20	48.90	1358.91	1356.37	2251.06	2627.83	3.48	2.21
3960.95	89.80	49.70	1358.91	1368.72	2265.42	2646.54	1.42	-0.63
3979.92	90.00	50.60	1358.95	1380.88	2279.98	2665.33	1.46	0.32
3998.98	90.10	50.50	1358.93	1392.99	2294.70	2684.23	0.22	0.16
4018.04	90.30	49.80	1358.86	1405.20	2309.34	2703.11	1.15	0.31
4036.96	89.70	48.50	1358.86	1417.58	2323.65	2721.80	2.27	-0.95
4055.92	89.10	48.70	1359.06	1430.11	2337.87	2740.50	1.00	-0.95
4088.00	89.10	48.70	1359.57	1451.28	2361.97	2772.15	0.00	0.00

SUMMARY

Blackspur 100 HZ Leduc-WB 16-11-051-02W5 was planned as a single leg horizontal **Sparky A** oil well in the Leduc region of Northwestern Alberta. From surface location 14-03-051-02 W5M, a build section curve was established after kick-off point at 1007.0 m MD. The **Sparky B** was intersected at 1437.0 m MD (1337.7 m TVD, -590.2 m MSL) and the **Sparky A** was intersected at 1468.0 m MD (1348.5 m TVD, -601.0 m MSL). **Intermediate casing point** was called and extrapolated to 1615.0 m MD (1367.8 m TVD, -602.3 m MSL) with inclination of 85.8°.

Overall, the observed local structure of the targeted **Sparky** reservoir is a Northeast to Southwest trending paleochannel. The total lateral length from intermediate casing point to total depth of the lateral section was 2473.0 meters and was drilled using a vertical section direction of 58.07° along a final azimuth of ~48.70° until the leg terminated at 4088.0 m MD (1359.6 m TVD, -612.1 m MSL).

Geology (Main Lateral Section)

1615.0 m MD: **Intermediate Casing Point:** 1367.8 m TVD, -602.3 m MSL

Sparky A

1615.0 – 1865.0 (250.0 m): Due to the presence of the **Med River Coal** in the build section, which indicated the **Sparky** channel had not cut down, ICP was set approximately 2 meters deeper than planned at -620.0 m SS. The overall structure was expected to be gently rising from heel to toe. After drill-out from ICP, the wellbore is steered flat then gradually rises to -618.0 m SS. Sandstone: clear to light grey, white to minor salt and pepper, trace green, trace light tan, predominantly unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, occasional chert, predominantly sub-angular, moderately sorted, inferred very good intergranular porosity, no visible shows; gas averages 86 units and peaks at 275 units. **Very Poor Reservoir.**

1865.0 – 1975.0 (110.0 m): The wellbore ascends and intersects the descending the **Med River Coal** at -618.8 m SS. Immediately following the coal intersection, **Sparky** reservoir is observed. Sandstone(80%): clear to light grey, occasional light brown, white to minor salt and pepper, trace green, trace light tan, abundant unconsolidated quartz grains, lower fine to upper fine, occasional lower medium to upper medium, common siliceous to slightly dolomitic to calcareous cement, minor kaolinite, trace glauconite grains and dark lithics, rare chert, predominantly sub-angular, moderately sorted, poor to fair intergranular porosity, no visible shows; Siltstone(20%): light grey, minor medium grey, salt and pepper, silt grains grading to lower very fine sand, common argillaceous inclusions and laminations, minor dark chert, siliceous to slightly calcareous cement, tight to very poor intergranular porosity, no shows. spotty to even oil staining (10%) with instant bright white to yellow slightly streaming cut; gas averages 185 units and peaks at 671 units. **Poor Reservoir.**

1975.0 – 2255.0 (280.0 m): The wellbore is steered flat, tracking at -618.0 m SS as gradually the **Sparky** reservoir develops. Sandstone(100%): clear to light grey, translucent in part, mottled brown grey and white, salt and pepper in part, minor black, predominantly quartz grains, occasional shale coal fragments, unconsolidated to moderately cemented, lower fine to upper fine, occasional lower medium to upper medium, siliceous to slightly dolomitic to calcareous cement, moderately sorted, sub-angular, poor to fair intergranular porosity, 30% tan to medium brown oil staining, spotty bright white fluorescence, immediate, cloudy, bright white fluorescent cut; gas averages 546 units and peaks at 2440 units. **Fair Reservoir.**

2255.0 – 2640.0 (385.0 m): As the wellbore passes by the 04-11-051-02W5 vertical well at -618.0 m SS, gas readings and oil shows begin to improve. Sandstone(100%): mottled brown and clear, clear, white, light grey, brown, predominantly quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 30 to 50% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash; gas averages 872 units and peaks at 3146units. **Fair to Good Reservoir.**

2640.0 – 2930.0 (290.0 m): The wellbore rises through the mid-part of the lateral section. Gas readings decrease and live oil shows marginally decrease. Sandstone(100%): mottled brown and clear, clear, white, light grey, brown, occasional unconsolidated quartz grains in a siliceous cement, part unconsolidated, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, fair intergranular porosity, occasional good intergranular porosity, 20% tan to medium brown oil staining, spotty pale to bright yellow fluorescence, immediate, bright cloudy white fluorescent cut, common free oil on sample wash; gas averages 522 units and peaks at 1074 units. **Fair Reservoir.**

2930.0 – 4088.0 (1158.0 m): The wellbore is steered to track the **Sparky** channel up dip. Oil shows improve and remain consistent for the last half of the wellbore. Sandstone(100%): light grey, clear, white, tan to medium brown, mottled in part, salt and pepper in part, predominantly unconsolidated quartz grains, occasional glauconite and dark lithics, occasional siliceous cement, lower fine to upper fine, occasional medium, moderately to well sorted, sub-angular, occasional sub-rounded, good intergranular porosity, 30 to 50% light to medium brown oil staining on grain edges, oil washing off samples, spotty pale to bright yellow fluorescence, immediate, bright streaming to cloudy white fluorescent cut, common to abundant free oil on sample wash; gas averages 1014 units and peaks at 2536 units. **Fair to Good Reservoir.**

4088.0 m MD: **Extrapolated Total Depth:** 1359.6 m TVD, -612.1 m MSL

OPERATIONS

- 1) 2022-01-19-1600 hrs: Spud 311.0 mm surface hole
- 2) 2022-01-19-2015 hrs: Reach surface casing point at 271.0 m MD
- 3) 2022-01-20-0724 hrs: Plug down on surface casing.
- 4) 2022-01-20-2325 hrs: Drill out surface casing with bit #2 and begin 222.0 mm vertical section with 2.12° motor
- 5) 2022-01-21-1330 hrs: Kick-off 222.0 mm build section at 1007.0 m MD with 2.12° motor
- 6) 2022-01-22-1425 hrs: Reach Intermediate Casing Point at 1615.0 m MD
- 7) 2022-01-24-0145 hrs: Plug down on intermediate casing
- 8) 2022-01-24-1710 hrs: Drill out intermediate casing with Bit #3, begin 159.0 mm lateral section with 1.83° motor
- 9) 2022-01-27-1220 hrs: Reach Total Depth of lateral section at 4088.0 m MD

Production values, gas percentage, rates of penetration, and oil shows were all considered as indicators of reservoir quality. This **Sparky A** horizontal well encompasses 2473.0 m of open hole in the lateral section. Of the **Sparky A** reservoir, 1543.0 m (62.4%) was fair to good reservoir, 570.0 m (23.0%) was fair reservoir, 110.0 m (4.4%) was poor reservoir and 250.0 m (10.0%) was very poor reservoir. Overall, Blackspur 100 HZ Leduc-WB 16-11-051-02W5 contained moderate to high gas readings, moderate percentages of oil staining with samples exhibiting bright florescent cuts and abundant free oil. In the case of Blackspur 100 HZ Leduc-WB 16-11-051-02W5, hydraulic fracturing should stimulate production from the entire **Sparky A** channel to result in a successful horizontal oil producer.

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