

2-3s-20E

**Professional Energy Services**  
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**GEOLOGICAL REPORT**

Operator: **EVERGREEN OPERATING CORPORATION**

Project: Sparks Well Name: Johnson Farms 14-2 WD

Location: SW SW SW - 330' FSL & 400' FWL

Sec. 2-3S-20E County: Doniphan State: Kansas

All measurements GL: 1079' API: 15-043-20041-00-00

Company: Sr. Operations Engineer: Mr. Tom Erwin

Company: Geologist: Mr. Paul Clarke

Professional Energy Services: Geologist: Rich Robba

Crown: Drilling Superintendent: Fred O'Doan

Patterson Logging: Engineer: Roger Taylor

Drilling Contractor: Layne Christensen Company

CBM Solutions: Desorption: Dean/Ken Glover/Dion

Geosearch Logging: Mudloggers: Kevin Clark/Nathan Barnes

Commenced: 02/21/04 Completed: 02/26/04

**KCC**  
**JUN 14 2004**  
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This geological report is prepared for **EVERGREEN OPERATING CORPORATION**. Wellsite geological supervision was conducted from surface to Total Depth. The Johnson Farms 14-2 WD was water drilled to the geological core prognosis Excello Shale starting core point, continuous cored from above the Excello Shale to the Mississippi and then deepened by rotary to TD. ROP, gas curves and sample descriptions from water rotary chips are recorded on the mud log and geophysical survey formation tops, visual core recovery descriptions and desorption canisters are listed below.

Johnson Farms 14-2 WD

This well had significant core loss between 1090-1140 and at other depths throughout coring. The actual amount of core loss is recorded as evaluated by actual measurements. It appears that the actual coal thicknesses and qualities are, at times, optimistic on the density geophysical surveys. The Fleming seam, as example, was intact and canded as 6" but reads a coal intersection over 1.5' on the sourced surveys.

Formation E-Log Tops

Heebner Shale:	354'	<b>RECEIVED</b>  <b>JUN 17 2004</b>  <b>KCC WICHITA</b>	Excello:	1094'
Lansing:	547'		VShale:	1179'
Stark Shale:	808'		Tebo Shale:	1264'
B/Kansas City:	860'		Mississippi:	1738'
Altamount:	976'		RTD:	1841'
Summit:	1062'		LTD: (15' fill)	1826'

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Geophysical Density Survey Coal and Coal Shale Intersections

Net Coals(ft) < 1.75 g.cc		Net Coals(ft) >1.75g.cc< 2.00 g.cc		Net Carbonaceous Shale (ft)	
Name/Canister	Depth	Name/Canister	Depth	Name/Canister	Depth
Lwr Sibley	499-500	Mulberry	993-994.7	Iron Post	1121.5-1122.3
Oswego	1041-1042	Bevier	1153.3-1154.8	Scammon	1251-1252.6
Fleming/223	1212.7-1213.6	Bluejacket F	1439.3-1440.6	BluejacketE	1437-1438
Mineral/T86&254	1235.6-1237.9	Rowe E/327	1547.8-1548.9		
Weir A	1280.6-1281.7	Neutral A/342	1563.4-1564		
Weir B/289	1299-1301.9	Werner A/399	1633.7-1635		
Drywood/T302	1494.3-1496.2	Riverton/T572	1704.8-1706.4		
Rowe D/T320	1539.8-1542.1				
Neutral B/343	1575-1577.3				

Cumulative Net Thickness Geophysical Density Survey

Net Coals (ft) < 1.75 g.cc	Net Coals (ft)>1.75g.cc < 2.00 g.cc	Net Carbonaceous Shale (ft)
15.4'	9.1'	4.4'

Visual Core Sample Descriptions

1070-1079 MUDSTONE: blu-gr, pasty tx, washouts, to p devel med tx underclay.  
 1079-1082 LIMESTONE: wh-gy, micro-vfnxln, foss, vp foss and interxln por, chky.  
 1082-1090 SHALE: blk w/ brn and gr sh argil, slumping, med carb coal shale v thin beds in middle, ns.  
 1090-1100 Lost 7' core recovery, SHALE: dk gr, hard, sli calc.  
 1100-1110 Lost 10' core recovery.  
 1110-1120 Lost 1.5' core recovery, SHALE: gy, sli fissile to pred soft, washouts.  
 1120-1130 Lost 1.8' core recovery, MUDSTONE: lt gy, soft, washing out to interbedded w/ lt gy sli hard.  
 1130-1135 Lost 1' recovery. (1131-1131.5 SHALE: blk w/ gy bands, med carb content.) SHALE: gy soft to laminated and hard.  
 1135-1140 Lost 1.6' core recovery, SHALE: gy soft to laminated and hard, aa.  
 1140-1146 SHALE: gy and lt gy varving, fissile, hard.  
 1146-1151 Lost .6' recovery, SHALE: blk, low carb w/ 1" brn sh banding w/ 2" coal shale at base, ns.  
 1151-1158 UNDERCLAY: army gy, soft, washouts, mudstone to fn tx.  
 1158-1161 SHALE: dk gy, semi hard and fissile in part.  
 1161-1167 UNDERCLAY: brn-maroon, p devel, fn tx.  
 1167-1171 SHALE, blk, hard, fissile, low carb content.  
 1171-1172 SHALE, blk, rubble, organic rich, no sho gas.

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### Visual Core Sample Descriptions

1172-1190 SHALE: blk, hard, fissile w/ 4"-6" layers of ls, blk-tan, foss, vfnxln, v p vis por.  
1190-1195 Lost 1' recovery, SHALE: blk, hard, fissile w/ 4"-6" layers of ls, blk-tan, foss, vfnxln, v p vis por, aa,  
w/ 1194-1194.1 Coal Shale appears to be intact.  
1195-1196 UNDERCLAY: lt gy, fn tx, soft.  
1196-1203 SILTSTONE: wh-gy to gy, v shly, soft, washouts.  
1203-1210 SHALE: blk, hard, fissile, low carb.  
1210-1210.6 COAL: dull, banded, pyr, shly at base, no sho gas.  
1211-1216 UNDERCLAY: dk gy, v low carb content, med tx, hard, lmy towards base.  
1216-1220 MUDSTONE: gy, soft, washouts.  
1220-1224 SHALE: lt gy grading to gy, varved and slumping.  
1224-1233 SHALE: dk gy w/ blk-gy sh varved w/ slumping.  
1233-1236.4 COAL: blk, calc, wk cleating, shly parting up to 6 inches.  
1237-1240 UNDERCLAY: gy, fn tx w/ low carb sh bands.  
1240-1246 SHALE: gy-gr, v hard.  
1246-1248 SHALE: gy-gr w/dk gy sh laminations w/ nodules and pebbles.  
1248-1249 UNDERCLAY: brn-blk, soft washes out.  
1249-1264 SHALE: gr, hard, lg brn nodules, occ blk-gr sh bands.  
1264-1271 UNDERCLAY: maroon-yell-gr, cs tx, soft.  
1271-1279 SHALE: lt gy w/ some v lt gy sh banding.  
1279-1284 UNDERCLAY: army gr w/ blk carb sh bands and wh mineralization.  
1284-1296 SHALE: blk to sh gy.  
1296.1-1297.6 COAL, dull banded, p cleating, trc gas.  
1298-1306 UNDERCLAY: gr, gy w/ roots and wh clay layers.  
1306-1314 SILTSTONE: lt gr w/ thin brn mineral layers, occ lt gy sh and sdy laminations.  
1314-1381 SANDSTONE: med gn, sub rnd, f sorted, gd interxln por, occ gy sh and few brn ss lamination.  
1381-1382 SANDSTONE: dk brn, wood tx, sli carb devel, tree?  
1382-1400 SANDSTONE: fn-med gn, v friable, gd intergn por, occ v thin carb sh laminations.  
1400-1410 Lost 2.5' core recovery, SANDSTONE: med gn, hard, top 2' v lmy.  
1410-1439 SANDSTONE: med gn, friable, gy, sub-rnd, w/ thin carb layer bec/ denser @ base.  
1435-1440 Lost 1.4' core recovery.  
1439-1439.3 COAL: sdy, pyr, some clean low density rubble, no sho gas.  
1440-1445 Lost 1' core recovery.  
1440-1442 SILTSTONE: v shly, gritty, soft w/ numerous thin carb sh bands.  
1442-1442.4 COAL: low density, pyr, rubble, p-f cleating, no sho gas.  
1443-1455 SILTSTONE: lt gy w/ occ carb sh thin mats, soft bec/ hard, gritty w/ numerous carb mats.  
1455-1491 SHALE: lt and dk gy seasonal varving, inc carb content towards base.  
1491.5-1492.8 COAL and COAL SHALE: low med. density, ash, shly, bkn lg pcs and some rubble, evidence  
master cleat, sli pyr, calc fill, trc gas.  
1493-1536 SHALE: blk-dk gy, v low carb to laminated sections.  
1536.8-1539 COAL: p cleated, dull, high ash content at top lower density towards base.  
1539-1544 SHALE: blk w/ lt gy sh thin beds.  
1544.8-1545.4 COAL: dull, shly partings, low ash content.  
1546-1548 UNDERCLAY: gy-gr, med tx, hard.  
1548-1550 SHALE: blk, low carb w/ thin to 6" shly ls layers, wh-gy, within.  
1550-1560 SHALE: dk gy w/ lt gy sh thin beds, scat shells.  
1560.7-1561.4 COAL: br, few shly partings, calc cement in excel cleating pattern.

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### Visual Core Sample Descriptions

1562-1565 UNDERCLAY: lt gy-gr, med tx, hard.  
1565-1571 SHALE: blk w/ lt gy sh to sh blk, low carb, thin beds  
1571.1-1574 COAL: v pyr at top, dull, med density, f cleating.  
1574-1629 SHALE: gy w/ some thin beds, brn nodules in lower section.  
1621-1631 Lost .5" core recovery  
1630.1-1631.7 COAL: med density, lg pyr clusters, rubble, shly.  
1632-1634 UNDERCLAY: wh-gy, med tx, brn nodules, slumping.  
1634-1638 SHALE: lt and dk gy thin beds.  
1638-1647 SHALE: blk w/ dk gy varving w/ fn gn sdy layers.  
1647-1648 SHALE: carb w/ 2-3" v shly coal layer.  
1648-1650 UNDERCLAY: brn-gy, cs tx w/ numerous brn nodules.  
1650-1666 SHALE: dk gy laminated w/ v fn gn ss.  
1666-1692 SHALE: lt gy w/ dk gy sh thin to thick bands, brn sh layers, nodules.  
1692-1692.3 COAL: rubble, med density, p cleating, sli pyr.  
1693-1698 UNDERCLAY: wh-gy, fn to hard.  
1698-1702 SHALE: dk gy w/ occ thin lt gy sh and sdy layers.  
1702.1-1704.1 COAL SHALE: high density, v pyr w/ bands and v lg clusters, p cleating, v shly.  
1704-1736 SANDSTONE: shly in part, vfngn, well sorted, v friable, bkn pcs coal and organic mat.  
1736-1740 LIMESTONE: vfn-fnxln, sli ool, sli sdy in part, no vis por, lt tan, sli chky.

### Conventional Oil and Gas Shows

No shows recorded.

Respectfully submitted,

Richard A. Robba, PG  
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Professional Energy Services

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