

# GEOLOGIST'S REPORT

OPERATOR **MURFIN DRILLING CO INC.**  
 LEASE **#1-5 Lana**

LOCATION **1710' FNL 375' FEL**  
 SEC **5** TWP **13S** RGE **32W**

COUNTY **LOGAN** STATE **KANSAS**  
 FIELD **HIGH HAT WEST**

CONTRACTOR **MURFIN DRILLING CO** RIG NO. **20**  
 COMMENCED **APRIL 16, 2013** COMPLETED **APRIL 29, 2013**  
 MUD DISPLACED **3230'** MUD TYPE **CHEMICAL**  
 DRILLING TIME (NET) FROM **3650'** TO **4770'**  
 SAMPLES SAVED FROM **3680'** TO **4770'**

GEOLOGICAL SUPERVISION FROM **3605'** TO **4770'**  
 GEOLOGIST ON WELL **STEPHEN J MILLER**

FORMATION NAME **LOG** TOP DATUM TOP DATUM  
 ANHYDRITE 2545 +517 2544 +516  
 B/ANHYDRITE 2564 +486 2567 +483  
 TOPEKA 3782 3784 3784 3784  
 HEBENER 4005 -945 4005 -945  
 LANING 4046 -986 4044 -984  
 STARK SHALE 4278 -1218 4278 -1218  
 B/KANSAS CITY 4340 -1280 4337 -1277  
 CHEROKEE 4588 -1488 4589 -1489  
 MISSISSIPPIAN 4673 -1613 4670 -1610  
 TOTAL DEPTH 4773 -1713 4770 -1710

ELEVATIONS  
 KB **3060'**  
 GL **3049'**

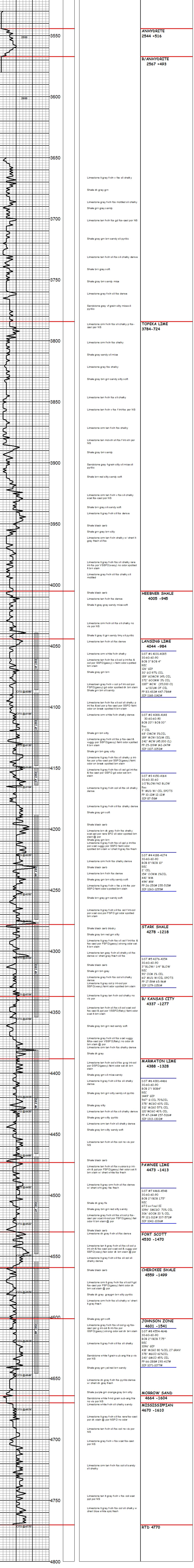
CASINO RECORD  
 CONDUCTOR \_\_\_\_\_  
 FROM K.B. \_\_\_\_\_

ELECTRICAL SURVEYS:  
**PIONEER**  
 DUAL INDUCTION  
 COMP NEUDENS  
 SONIC  
 MICROLOG

FORMATION NAME	LOG	TOP DATUM	SAMPLE TOP DATUM
ANHYDRITE	2545	+517	2544 +516
B/ANHYDRITE	2564	+486	2567 +483
TOPEKA	3782	-722	3784 3784
HEBENER	4005	-945	4005 -945
LANING	4046	-986	4044 -984
STARK SHALE	4278	-1218	4278 -1218
B/KANSAS CITY	4340	-1280	4337 -1277
CHEROKEE	4588	-1488	4589 -1489
MISSISSIPPIAN	4673	-1613	4670 -1610
TOTAL DEPTH	4773	-1713	4770 -1710

REMARKS  
 API 15-109-21171  
 Drilling Fluids: MORGAN MUD  
 Drill Stem Testing: TRILOBITE  
 Gas Trailer: NONE  
 Reserve Pit Chlorides: 7000 PPM

DEPTH	DRILL TIME (MIN/FT)	REMARKS
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