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FINAL REPORT

Client Name:	**EMPIRE OIL & GAS** **Nedlands, Western Australia**
Report Date:	**30 November 2007**
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Technology Used:	**Thermo Stimulated Luminescence (TSL)**
Fields Investigated:	**Parrot Hill East (Bee-Eater) Prospect**
	Lake MacLeod (Carnarvon Basin)
	Nabalgee Area
	East Paterson Area
	Whitelock Dam Area
	Sandalwood Area

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1. STUDY SUMMARY

It is well known that hydrocarbons, as they seep up toward the surface, affect the near-surface soil causing certain defects in the soil's molecular structure. Our company's proprietary methods and machines detect and measure the HC-associated molecular defects. We analyzed hundreds of the client's soil samples for these defects. These latest tests were conducted on the samples collected on 7 promising fields, all in Western Australia. Here is a brief field-by-field summary:

1.1 Parrot Hill East (Bee-Eater)

A strong TSL anomaly, indicative of a substantial HC presence, has been detected at a very close proximity to the planned Bee Eater-1 well.

1.2 Lake MacLeod

A strong TSL anomaly confirmed a heavy **HC presence. The pool boundaries were outlined. The TSL readings showed that the pool is larger than previously thought expanding 2 km Northwest of the originally projected boundary. The optimal drilling site was identified.**

1.3 Nabalgee Area

The TSL readings were generally low. We didn't see any large HC accumulations in the test area.

1.4 East Paterson Area

This site showed some anomalous TLS readings pointing at the HC presence in the Southeastern corner of the tested area. Taking more samples is suggested before any decision on drilling is made.

1.5 Whitelock Dam Area

A strong TLS anomaly, indicative of the HCs, was detected in the Southeastern corner of the sampled area. A good possible drilling location was identified. Testing of additional samples was suggested to a client in order to identify the very best position for an exploration well.

1.6 Sandalwood

A TSL anomaly was detected, getting larger along the Southwestern side of the tested area. Collection of additional samples was suggested in order to determine the pool boundaries and the optimal well location.

1.7 Midway Area

Small TSL anomalies were detected in the Southern triangle portion within the sampled area. This is the case when the pool's size and boundaries are difficult to identify. At present, the available TSL data does not support drilling.

2. DETAILED METHOD DESCRIPTION

The Thermo Stimulated Luminescence (TSL) method is based on a phenomenon first observed by the company's founder, Dr. Gregory Fogel in the 1980s: When a near-surface soil is subjected to the highly dispersed hydrocarbon (HC) vapors seeping up from the oil/gas pool for some thousands of years, the molecular structure in soil particles is affected. Several factors, associated with the presence of hydrocarbons, cause the molecular defects resulting in the elevated TSL readings. These factors include, but not limited, to:

1. **Organo-Metallic Compounds**
2. **Oxidized Metallic Porphyrins**
3. **Uranium and Thorium**
4. **Vanadium Salts**
5. **Potassium – 40**
6. **Radon**

During the present study, several hundred of the quartz –based soil samples were compared by their TSL "signatures" in order to detect similarities and/or differences between the molecular structures of these samples. The received test results, when statistically processed, indicated whether the analyzed samples were excavated from the area outside the boundaries of the petroleum/gas pool, or from the area directly above it. In most cases, the test results allowed not only the detection of oil & gas pools, but also the outlining of the pool boundaries and pointing at the optimal well location. The specific steps, performed in the process of the test, included:

1) Sample Collection. Sampling points were selected from within, and just outside, the above potentially HC-containing structure areas. These sampling points were located at equal distances along the pre-determined straight paths crisscrossing these areas. The sampling points were plotted on a diagram or map. Soil samples were excavated from these sampling points. The samples came from below the soil layer subjected to antropogenic action. The extracted samples were marked, packaged in dark containers, and sent to us for the TSL analysis.

2) Pre -Treatment. Our company used its proprietary radiation pre-treatment method that enhanced the molecular defects in soil particles. Without this pre-treatment, even the most sensitive instruments available today do not detect abnormalities caused by the soil's exposure to the very low concentrations of hydrocarbons.

3) Measurement. The company used a custom-built, highly sensitive TSL dosimeter. The pre-treated test soil samples and standard reference samples expelling a pre-determined TSL signal, were compared. The sensitivity of the new high-precision instrument yielded the most voluble information on the molecular-level defects in the samples. Each sample was re-tested at least 3 times in order to assure the best accuracy.

4) Processing. Statistical methods were used in order to establish for each prospect: (1) The range of the TSL test result values indicating thousands years of exposure to hydrocarbons (thus pointing to the presence of a gas/oil pool), and (2) the range of values pointing to the absence of such exposure. A custom-designed AI system was used to assign to each tested sample a numerical index (in arbitrary TSL units). Each index became the measure of a likelihood of the sample coming from the inner boundaries of an HC pool. Though index values varied from one region to another, a higher index was generally indicative of samples coming from the above the oil/gas pool, and a lower index was interpreted as a sign of the pool's absence. In some cases, the elevated readings pointed at the pool boundaries (as vs. its main body). The difference between the "positive" and "negative" sets of ranges in most cases was high, allowing outlining the gas/oil anomaly edge with a great degree of certainty.

3. DETAILED STUDY RESULTS

3.1 Parrot Hill East (Bee Eater Prospect)

There is a strong TSL anomaly in the Eastern part of the explored area. This anomaly is indicative of a substantial HC presence. The readings within the tested area varied between 9.7 and 3.4 TSL units (3:1 high-to-low ratio). Samples ##73-77 and 81, located at a close proximity to the projected Bee Eater-1 well, all tested with the anomalously high readings. Samples ##75 and 81 showed two highest readings. The fact that the samples with the anomalously high TSL readings were excavated from over a geological structure (just west of a fault block), provided an additional level of certainty in the HC presence.

If the well location decision would only be based on the values of the TSL readings, the optimal well location would be 200 meters south from the currently-planned Bee Eater-1 well. However accurate, the TSL test results could point at a location a few dozen meters off

the heaviest HC accumulation. The reason is: The HC vapors, causing molecular anomalies, do not always seep straight up out of the highest HC concentrations (directly above the pool), but wherever they could. If the pool is next to a fault, the vapors tend to seep through cracks in the fault affecting the soil thermoluminescence at, and around, the fault line. These cracks, responsible for shifting the vapor paths, may account for the 200-meter difference between the projected Bee Eater-1 well location and our highest reading. In our opinion, regardless whether the drilling is done at the originally planned Bee Eater-1 location, or at our suggested location, the new well would engage the HC reservoir.

In order to re-check the final well location site, we suggest drawing a straight line from East to West, this line criss-crossing the point of collection of the sample #75 (it corresponds to the sampling point #49 on the map). Three (3) samples, taken 50 meters apart from each other, could then be excavated from the Eastern side of the point #75, and another 3 samples, in the same 50-meter increments, from the Western side.

3.2 Lake MacLeod Prospect (Carnarvon Basin)

This study started as a blind study. The client submitted a map to us only after receiving the preliminary study results. A strong TSL anomaly confirmed the HC presence. The values varied between 20.24 arbitrary TSL units at the boundary of the pool and 1.70 TSL units on the background. These values represented an unusually high 12:1 high-to-low ratio. This great difference in the TSL readings allowed us to outline the pool boundaries with a high degree of confidence.

The highest readings were obtained at samples ##34-36 and ##44-47 taken from the Northern and Southern boundaries of the Lake McLeod Prospect. This is a classical example where the TSL readings outlined the edges of the HC reservoir rather than pointing at its heaviest accumulation. It is well known that, if the salt shield covers the pool, the HC vapors seep up wherever they can. This is why, in this case, the likely presence of a salt dome caused the high TSL around the edges of the shield rather than its central part. Thanks to the possible cracks in the salt, the samples ##37-43, which were taken from over the crest of the anticline (directly over the pool), also had relatively high readings (as compared to the background).

The reservoir is found to extend about 2 km North from the originally outlined boundaries, all-the-way to the point #34 on the Northwest. If it is necessary to establish the East-West boundaries, it would then be necessary to draw two Northwest-to-Southeast lines parallel to the existing one, each line 2 km away from the existing one, and take samples along these lines. However, this would be only necessary if a cluster of the production wells is planned.

For now, the best place for a single exploration well appears to be at the center of the pool, at the location of the sample point #39.

3.3 Nabalgee Area

The readings were all low, in the 4.1-to-2.1 TSL unit range. The high-to-low ratio was also low at 2:1. We didn't see any large HC accumulations.

The samples were taken in the square pattern about 1 km west of the Waste Treatment Plant. There is a well 4 km to the North. The higher readings (all in the 4 unit –range), were obtained from 3 samples: ##92, 93 & 94. These bag numbers corresponded the sampling points ##59, 60 & 61.

There is a possibility of small natural gas accumulations, but in this case we could not suggest drilling any wells.

.4 East Paterson Area

The samples were taken along a fault between two existing wells. The structure is indicative of some HC presence. The TSL readings are in the medium-to-low range, from 10.10 TSL units to 3.45 units (approx. 3:1 high-to-low ratio). The higher TSL readings were obtained from the samples ##20 - 25 which correspond to the sampling points ##20 - 25. Three highest readings were obtained from the samples ## 22, 23 and 24. These highest values were obtained from the area close to an electro-magnetic anomaly. The sample bags taken next to the Paterson-1 well (##26 - 35) were missing. Per our tests, there are some HC in the sampling area, but it is not at all clear whether the HC quantity justifies drilling the production well(s).

This is why we suggest taking more samples. The first step would be drafting of a straight line on the map going from Northwest to Southeast and intersecting the location of the sampling point #23. We propose that a client excavates 3 more samples every 150 meters alone this line from the Northwest side of the sampling point, and 3 more samples, at the same distances, from the Southeast side.

3.5 Whitelock Dam Area

A strong TSL anomaly, indicative of a heavy HC presence, was detected. The marked on the map samples from the Western side of the sampling area are missing. However, the missing samples appear to be off-structure.

The area readings vary a great deal from 25.05 TSL units to 4.10 units. This spread represents an impressive 6:1 high-to-low ratio. The most interesting results point to the Southeastern corner of the sampled area. The anomalous samples ##43 to 48 (with the TSL readings between 12.50 and 25.05) were excavated along the seismic line R85-24 to the East of Whitlock Dam-1. They coincide with the bright amplitude anomalies in Permian sands at 525 milliseconds (about 750 metres). Sample #48 (25.05TSL units) represents the highest TSL glow. It was taken just West of the bounding reverse fault. This is why the Whitlock Dam at EP-412 (corresponding to the sampling site #48) appears to be the optimal well location.

The coincidence of the geological and the TSL data is very encouraging and we propose taking more samples in a North-South direction for control. Testing of 4 more samples taken 100 meters apart, is suggested.

3.6 Sandalwood

A TSL anomaly was detected. The readings were all high, between 25.4 and 12.3 TSL units (with the high-to-low ratio of 2:1). This relatively narrow TSL readings' range made the establishment of the pool boundaries very difficult.

This area looked somewhat promising. Specifically, the Southwestern side of the sampled triangular area pointed at the HC presence. This is why we recommended taking a few more samples (about 100 meters apart) along a straight line drawn West from the sample point #17 (sample #117), and also along a straight line going South from the sample point 11 (sample #111). This would allow us to project the boundaries of the pool. Unless the additional sampling is completed, it is difficult to say whether the size of the reservoir justifies the drilling.

3.7 Midway Area

Samples were taken along a fault in the area of several wells. In the most Southern part of the fault, the samples were taken in a triangular pattern. In general, the Northern corner of this triangular pattern appears to be the most promising location for a future well. On the background of samples showing the TSL readings in the range starting at 5.20, the samples ##90 and 91 have especially high readings, as high as 25.50 for #91. The 25.5-to-5.2 TSL unit -range represents a nice (5:1) high-to-low ratio.

Unfortunately, within the lower triangle, the high and low readings are not consistent forming a nearly "checkerboard" pattern. This pattern points to several small reservoirs, an interrupted pool, or a stone or salt shield above the pool with a few cracks in it. This is the case where the pool boundaries are very difficult to determine. The drilling may yield HC. However, this is the case where the TSL method did not yield results on the size, boundaries, or commercial value of the pool.

4. CONCLUSION

The total of 7 pools were studied using the company's proprietary TSL method. In most cases, a definitive conclusion was made on the HC presence. In three cases, we were able to make strong "drill" recommendations, outline the pool boundaries, and point to the best well site. In one case, the HC pool was not detected. In two cases, the HCs were detected but the method did yield results on the pool's size or its boundaries. In one case, the TSL method allowed projecting the pool's size and boundaries, but not the best drilling site. In all the "vague" cases, the sites for the additional soil sampling were suggested.