

LOG OPERATIONS AND FORMATION EVALUATION REPORT

DISCUSSION - FORMATION EVALUATION

A field log interpretation was performed aboard rig Diamond M Epoch using a Grid Compass computer and a predefined Lotus 123 formation evaluation program (HEEMINK-V0.9). Thirty-three significant intervals of interest were selected representing about 98.6 meters of sandstone facies (See attached Formation Evaluation Spread Sheet).

Seven levels of S.P. were calculated resulting in a very speculative estimate of formation water resistivity of about 0.05 ohm-m.

Near T.D. the S.P. response trends toward a flat if not a slightly positive response which could be an indication of slightly fresher formation water.

A Dual Water evaluation was performed using $R_{wf} = 0.05$ and $R_{wb} = 0.15$ ohm-m.

Neutron - density and gamma ray were used in combination to estimate a minimum shale value. Processed results show about 78.4 net meters of hydrocarbon potential based on water saturations being less than or equal to 50 percent. Calculated porosity generally ranges from 11 to 15 percent with some excursions to 17 percent in thin beds. Calculated porosities degrade to about 8 percent near T.D.

A Schlumberger Cyberlook computer processed interpretation was generated in Sydney. Shale volume estimates were primarily keyed to the gamma ray and rho-matrix apparent:

	CURVE	CLEAN	SHALE
gamma ray		24 A.P.I.	102 A.P.I.
rho-matrix apparent		2.65 gm/cc	2.90 gm/cc

A dual water interpretation was performed using the same free and bound water values as above.

The neutron porosity was environmentally corrected for pressure and temperature which resulted in about a +2.5 porosity unit shift.

Two estimates of coal are presented based on sonic responses. The darker shading suggests a more positive estimate and is indexed on sonic values greater than or equal to 99 micro-sec/foot. The lighter shading is a possible inference of coal and is indexed on sonic values greater than or equal to 85 micro-sec/foot.

Sonic log porosity was used in zones where the neutron-density tool was sticking. A fairly decent porosity match in clean sands was obtained by using a 180 micro-sec/foot fluid travel time and a 57 micro-sec/foot matrix travel time.

There is about 73.4 meters of sandstone facies having porosity greater than or equal to 10 percent and water saturations less than or equal to 50 percent. The most massive interval (net 27.8 meters) which meets the above criteria occurs between 3657 and 3699.5 meters.