RECON

www.reconpetro.com

The New Standard in Log Data Resolution

HDD™ HIGH DEFINITION DATA RECON

Invisible Casing

New density logging tool measures rock properties through steel and cement

TWENTY YEARS AGO WITH NATURAL GAS AT UNDER $1 an mcf, operators often couldn't justify the expense of logging the shallower uphole zones as they drilled through in the search for more prolific reservoirs.

And while it was well known that coal and shallow gas sands under-lie much of Western Canada, little thought was given to extracting the methane from them.

Today, with fewer new exploration opportunities in an increasingly mature basin, operators are looking at revisiting old fields in search of bypassed pay. A new through-casing density logging tool promises to increase the odds of doing just that by providing a better picture of the formation itself.

"You need somebody with the technology to make the casing invisible again," says Michael Boyle, President of Calgary-based RECON Petrotechnologies Ltd.

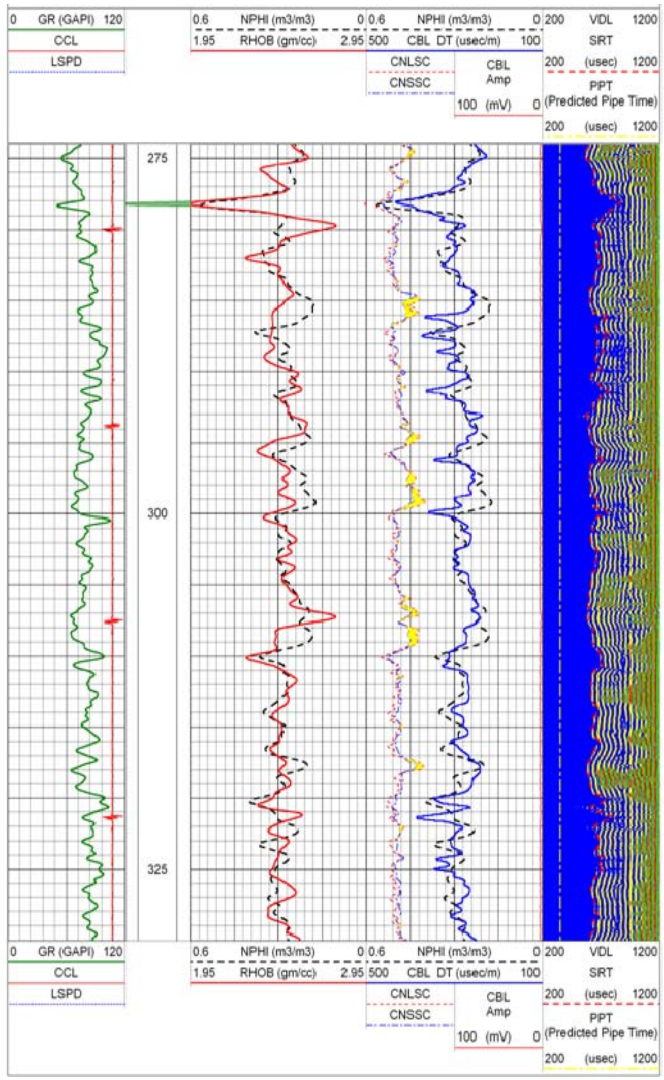
Logging a well open hole when the tools are up against the rock face is one thing, he says. "To come back after the fact, after the steel pipe is there, cemented in between, and still measure the pure rock properties through this steel and cement is an amazing thing."

In a coal-bed methane well, for example, RECON can log the bulk density values of the coals, says Mike Seifert, Sales Manager of Canadian Operations. Using existing algorithms, RECON can perform a "proximate analysis" on the coals, which estimates the percentage of volatiles, ash, moisture and fixed carbon within the coal seams. The greater the ash content, for example, the reduced ability of the coal to adsorb gas and produce it.

"The tool is a tremendous technology for identifying coal because we can measure the coal quality through the casing," adds Boyle. "Any well that is already drilled; you can go back and log those coal seams to get that coal quality." The service also has been beneficial in the exploitation of shallow sands such as the Edmonton, Belly River and Medicine Hat formations.

An exploration company can obtain better data on new wells in an existing oilfield and then apply that information to old wells in those same fields, identifying uphole potential, says Seifert.

The through-casing density tool is a Made-In Canada technology. Kirk Stewart, an employee of RECON, which holds the patent rights, spent two years working on the tool. It is manufactured at RECON's Edmonton facility.



RECON LOGS

RECON cased hole neutron-density log presentation provides multiple qualifiers for gas potential using density-neutron overlay, neutron near/far counts, and sonic-neutron overlay. Cement bond VDL highlights hydraulic isolation for completions and cement bond quality.

Because of the tool's patent-pending status in Canada and the United States, RECON is currently unable to talk about how it works or what it looks like. However, it plans to publish a paper on the technology once it is permitted to do so.

One of the big advantages of the tool is its versatility in terms of how it can be employed, Boyle says. The through-casing density tool can be run on Coiled Tubing, E-coil, Slickline or Well Tractor. "We can run it on conventional wireline as a conventional logging tool (along with the neutron and gamma ray) or on specialized delivery systems for high angle or horizontal wells."

If the tool is connected to a wireline, logging can be recorded in real time. Another option is a memory system that can be put into a coil or other conveyance to record data that can then be downloaded when it is pulled back to surface.

The price for a job is based on depth, pressure, temperature and the amount of data the operator is looking for.

RECON is already making its name in the Barnett Shale in the United States with its Horizontal Well Production logging delivery system it developed itself, but in Canada it has been most successful with its unique through-casing density technology, says Boyle. "With the combination of the two, we can go into any horizontal well."

A horizontal well drilled this winter in the Horn River Basin shale gas play in northeastern British Columbia used the company's through-casing density log, along with the GR-Neutron. The operator of the well also collected open-hole data on the well from logging-while-drilling and RECON used that data to verify the accuracy of the through-casing density data. The ability to capture accurate neutron-density data through casing could result in significant cost savings for exploration companies, say Seifert.

Ember Resources Ltd. tested the through-casing density tool in 12 vertical wells in the fall of 2008 and would definitely use it again, says Quinton Rafuse, Vice-President of Geoscience. The company was looking for better resolution of lithologies and reservoir properties in shallow gas and Horseshoe Canyon coals and the tool performed as advertised, he says.

"It was better at resolving thin coalbeds than previous tools," he says. "Coalbeds normally would be overlooked with previous tools."

Ember also used the through-casing density tool in memory mode in a cased-hole application for a slant well. The use of the memory mode can reduce costs as the operator does not need to run an e-line (electrical) coil, says Rafuse. A decision on whether to deploy the tool becomes a value decision, he adds. "You pay for better data."

As it introduces its new tool to industry, RECON will need to work with the geologists and engineers who are using the data because there will be some differences from conventional logging, says Seifert. For example, even though RECON can discount the effect of the casing and cement, the more porous and permeable formations are subject to invasion of cement and drilling fluids, which can result in a lower porosity value.

As a result, RECON opts to present the density data as a bulk density value, which is not the standard presentation that professionals are used to. "It does make a difference," he says. "It's something that we had to learn ourselves as part of our own learning process." A bulk density and a sonic curve respond the same way to shales and tight sands. By displaying the bulk density and neutron porosity overlay, it is giving the client the same data response and curve recognition that a sonic-neutron does but with a higher degree of confidence, Seifert notes.

As for the future, RECON is exploring ways to take its through-casing density tool to the next step and to do more with the data.

Boyle believes that over time the tool will be run on every well before it is abandoned because of the bypassed pay zones on virtually every well in Canada today, especially those more than five of 10 years old. "Before they spend $50,000 to abandon a well, they should apply this technology," he says. "In many cases, they may bring a well back into production with a new zone or CBM capability they did not realize or have not yet realized – or quantified." **Elsie Ross**

CONTACT FOR MORE INFORMATION
Mike Seifert, RECON Tel: (403) 517-3267,
E-mail: mseifert@reconpetro.com

This article highlights the versatility and value to producers of RECON's memory based, through-casing, density logging. This technology, when run in combination with RECON's existing 1-11/16" (43mm) OD cased hole tool suite, provides multiple qualifiers for gas potential using density-neutron overlay, near/far neutron counts and sonic-neutron overlay. A radial bond sector map and VDL provide an indication of the cement bond quality for completions, confirming potential zones of interest have hydraulic isolation.

Applications of this technology include:
- **Shallow gas**
- **Bypass pay**
- **Unconventional gas including CBM, tight gas and shale gas**
- **Horizontal wells**

For more information, please contact: Mike Seifert, RECON
- **Tel: 403-517-3267**
- **email: mseifert@reconpetro.com**

www.reconpetro.com