

SILIXA

CARINA[®] SEISMIC

Carina Seismic service delivers high-accuracy, repeat seismic on demand without interrupting production or risking infrastructure.

By utilising Silixa's new family of engineered Constellation™ cables the Carina[®] Sensing System offers numerous benefits beyond conventional geophones for seismic data acquisition and permanent reservoir monitoring.

Permanent Reservoir Monitoring

Permanent Reservoir Monitoring (PRM) offers unparalleled insight into changes occurring within the reservoir, enabling rapid decisions to adjust well design and positioning, production and injection rates in order to maximise recovery. PRM relies on permanently installed sensors providing high quality, continuous or semi-continuous data in real-time. Of particular value is seismic data, which enables the imaging of hydrocarbon-bearing layers beneath the earth's surface.

However, accurate in-well seismic data from the most valuable assets is rarely acquired as a result of the cost and risk of well-intervention wireline or seabed surface seismic.

Carina Seismic enables borehole seismic acquisition with greatly reduced source effort achieving high quality, densely sampled seismic data with significantly reduced operating time and costs.

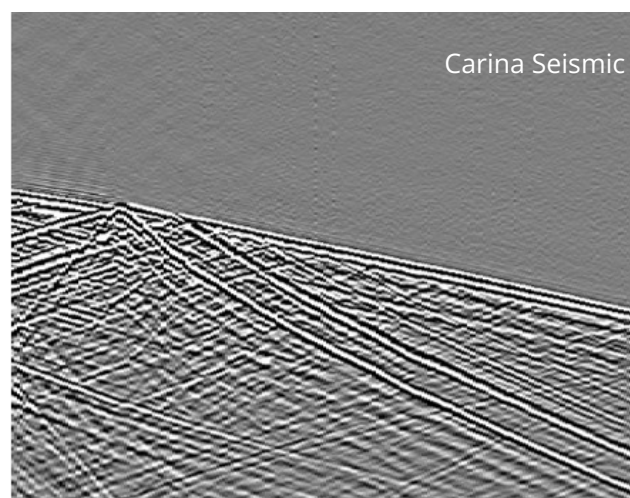
Performance Beyond Geophones

With the combination of up to 20dB improvement in SNR, fine spatial sampling and full wellbore coverage for every shot, Carina Seismic data offers unprecedented detail in every shot record.

Recent field data shows a direct comparison between Carina Seismic and conventional wireline geophones. The test involved acquisition in a well with a Constellation enabled fibre-optic cable cemented behind the casing, with wireline geophones deployed in the same well.

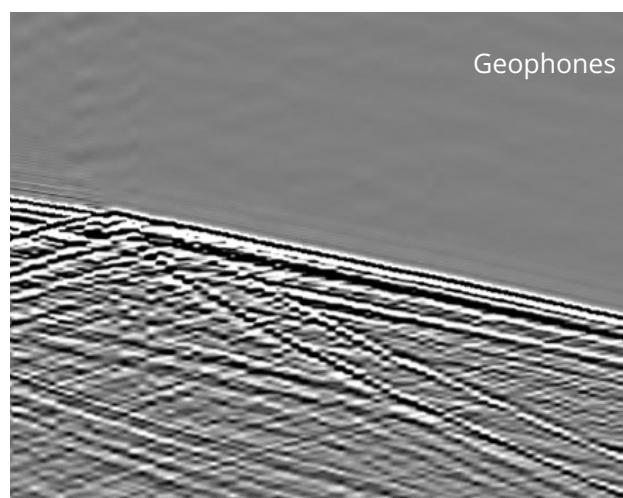
The seismic source was a 26,000lb vibroseis situated approx. 700m from the wellhead.

This data, collected at the CO2CRC Otway site, shows how Carina Seismic offers much greater detail in each shot record compared to geophones. Deep reflections are clearer, slower moving signals such as converted shear reflections are better resolved.



Carina Seismic: stack of 5 sweeps, acquired with full wellbore coverage for every shot. Total acquisition time: ~4mins.

*Data courtesy of CO2CRC Ltd



Wireline geophones: stack of 5 sweeps, over 11 tool positions. Total acquisition time: ~4hrs.

Key Benefits

- **Unrivalled data quality enables cost-effective reservoir characterisation**

Extremely high signal to noise ratio gives seismic data quality beyond that of a standard geophone array

- **Permanent installation reduces OPEX across life of well**

Continuous data availability without the need for intervention

- **Eliminate the cost of deferred production**

Intervention-free operations allow for surveys in flowing wells

- **Increase ultimate recovery**

Permanent installations enable 4D seismic on demand throughout the life of the well

- **New powerful capabilities without further additional CAPEX**

Continuous well diagnostics throughout the life of the well

- **Suitable for long-offset subsea applications**

High signal to noise ratio even over long tiebacks

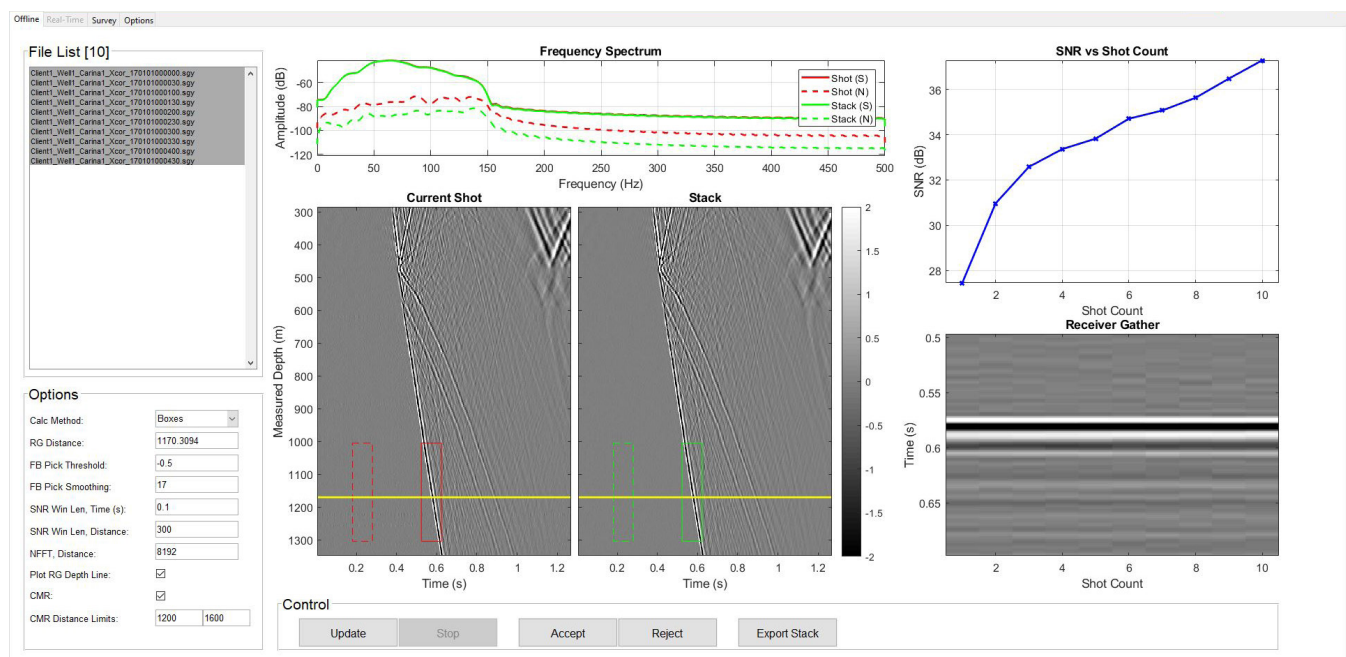
High Quality Seismic Data at a Fraction of the Time and Cost of Conventional Methods

Carina Seismic achieves full wellbore coverage for every shot, eliminating the need for repositioning a tool at different depths, enabling vertical seismic profiling within minutes instead of hours.

With permanently installed fibres, the receivers are available at all times with no further deployment costs. Repeat surveys can be acquired on-demand at a fraction of the cost, enabling more frequent surveys giving greater insight into changes in the reservoir.

Silixa's new suite of advanced software tools provides real-time field deliverables. Acquisition QC plots are generated at the wellsite to ensure high quality, accurate data is collected. SEGY files, fully populated with accurate source and receiver headers, are generated in real-time.

Silixa has worked closely with some of the world's largest operators to implement IT solutions that enable transfer of data to processing centres around the world. With fast-track processing flows, images can be available a few hours after acquisition for accelerated decision making.



Silixa's acquisition QC tools give real-time analysis for QC of timing, geometry and data quality

*Data courtesy of CO2CRC Ltd

CARINA[®] SEISMIC

breakthrough performance in seismic acquisition



Silixa offers the finest portfolio of distributed sensing solutions available anywhere. Shaped by 15 years of pioneering research and application, our end-to-end solutions enable temperature, strain and acoustic measurements at the highest fidelity – even in the most hostile settings.

This unrivalled technical portfolio is backed by project management and specialist data services to help customers finally overcome the obstacles of distance, time and knowledge, to turn data into decisions.

Built by subject matter experts, Silixa's engineered solutions serve the unique demands of multiple sectors. Today the company is active in the energy, defence and mining domains – also providing cost effective, low-impact monitoring of built and natural environments, as well as industrial assets and operations.

Recognised as an award-winning innovator, Silixa has developed a reputation for revolutionising multiple industries.

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