

Enterprise Project

Vertical Seismic Profiling



Project Update | May 2019

The Enterprise Project is a program to develop additional offshore natural gas reservoirs in the Victorian Otway Basin. The potential reservoirs are located within 3 nautical miles (5.55 km) from the coastline in State waters, while the well site will be located onshore near Port Campbell.

Vertical Seismic Profiling

A common technique called 'Vertical Seismic Profiling' (VSP) will be used to evaluate the well during drilling operations. A high-resolution image of the geology of the well will be produced to enable the well data to be matched to existing seismic data so the target location can be verified, and the gas reservoir further assessed.

The technology works by generating a seismic energy source both onshore (at the wellsite) and offshore, to travel to geophone receivers within the well. The sound energy is much lower than conventional 3D seismic surveys (see page 2 diagram) and will be sounded intermittently.

Location and timing

The VSP will occur off the coast between Peterborough and Port Campbell, over a narrow area above the well path of approximately 0.5 x 4 km, as shown in the map below. To ensure safe operations, the vessel conducting the VSP will not enter the shallower depths of approximately 7 m or less.

The VSP is currently planned for March 2020. It will be conducted for 24-48 hours, depending on weather conditions.

Vessel and equipment

The offshore activity will be carried out by a medium sized vessel which will use a crane to lower an airgun to 3 - 6 m depth to create the seismic source. No equipment will be placed on the seabed and the vessel will not tow any streamers. An onshore seismic source will be created at the well site by an airgun lowered into a 5 m deep water tank temporarily buried on the wellsite. Geophones will be placed within the well to record the seismic data from both sources.

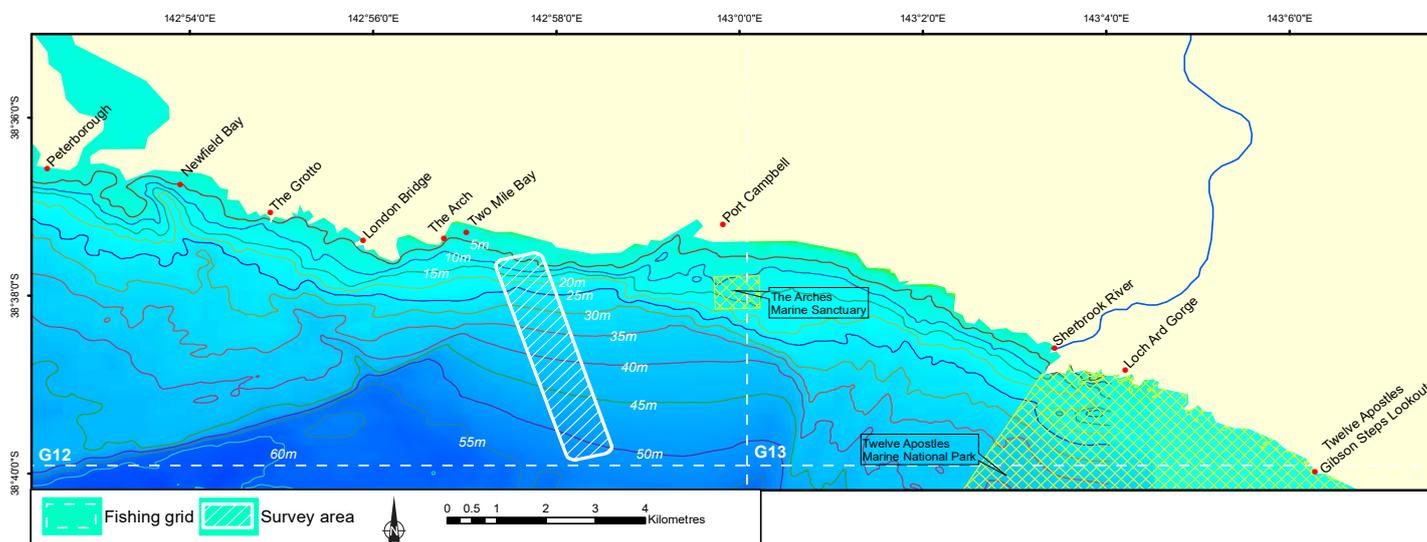
Swimming and diving safely

Due to the potential for hearing discomfort during the VSP activity, we recommend that recreational and commercial SCUBA diving, swimming or surfing does not occur at: Two Mile Bay; The Arches Marine Sanctuary; and the area northwest of the Twelve Apostles Gibson Steps Lookout in the Twelve Apostles Marine National Park.

Although sound from the VSP may still be detected by some people, water activities such as SCUBA diving, swimming or surfing may continue as normal at: Port Campbell and the surf break south of the jetty; Peterborough; Newfield Bay; and the Newfield and Schomberg shipwreck dive sites.

Fishing safely

To avoid entanglement and safety risks, fishing nets, lines or pots should not be placed within the operating path of the offshore VSP. In accordance with normal maritime safety protocols, other vessels in the area should maintain safe distances. We encourage any commercial fishers who have a history of fishing in this area at the time we will be doing the VSP, to contact us to discuss arrangements to minimise any impacts.



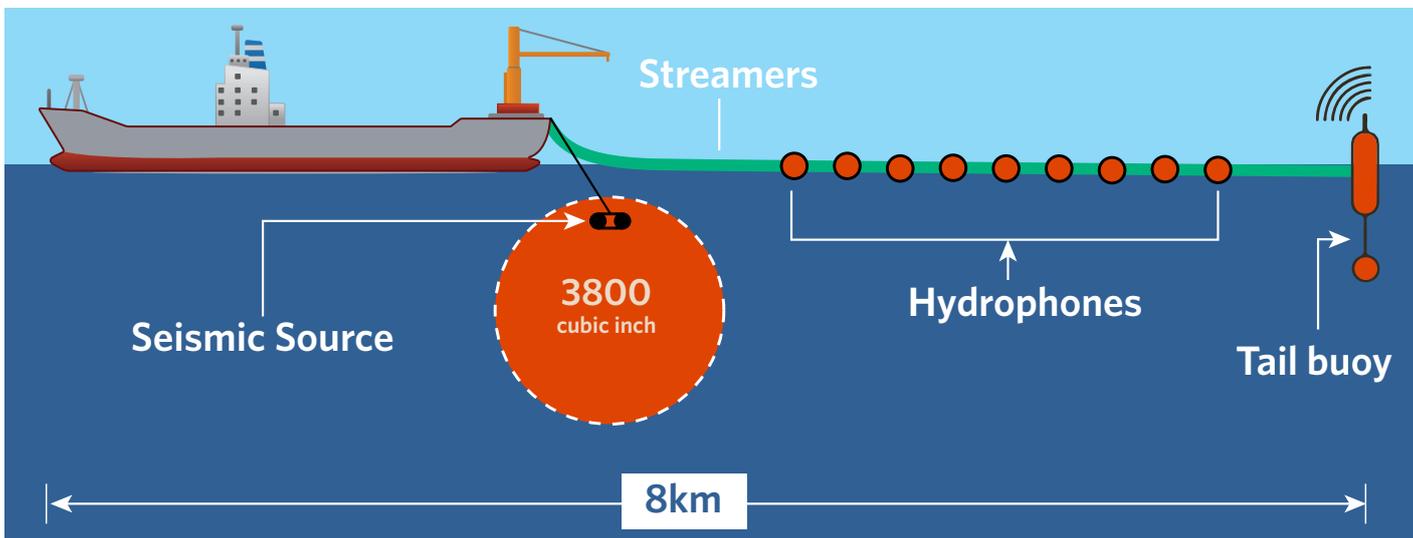
Marine 3D Seismic Survey

Vessel: 90m long; 8m draft.

Seismic Source: 3800 cubic inch air gun off stern.

Seismic Receivers: 10 towed streamers with hydrophones; 12km wide; 8km long.

Duration: around 8 weeks depending on size of area and weather.



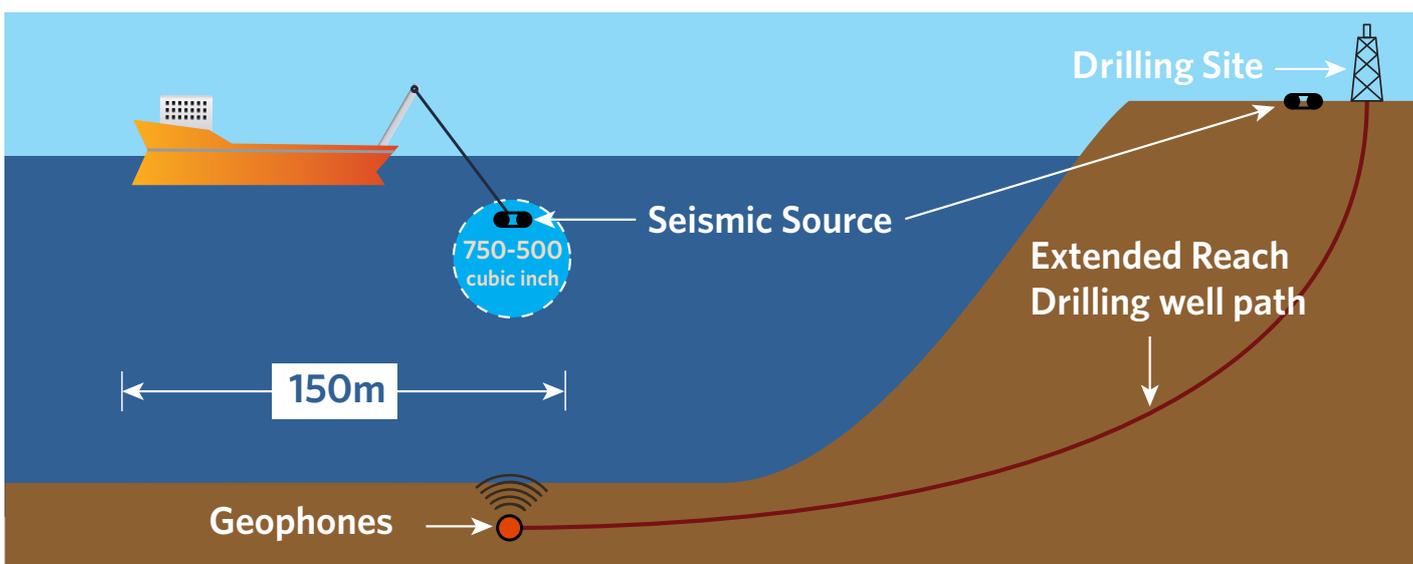
Vertical Seismic Profiling

Vessel: 35m long; 1.8m draft.

Seismic Source: 750-500 cubic inch air gun off vessel crane; plus land source near well top hole.

Seismic Receivers: Geophones within well.

Duration: 24 to 48 hours depending on weather.



Explanatory notes: illustrations above are not to scale; descriptions of Marine 3D Seismic Surveys represent a typical survey and will depend on each survey requirements; descriptions of Vertical Seismic Profiling (VSP) represent the proposed equipment and approach for the Enterprise VSP.

Questions and Answers

How do you drill from onshore to offshore?

To access the offshore natural gas reservoir from an onshore well site, 'extended reach drilling' will be used to drill down vertically to around 1 km and then out underneath the sea bed up to 5.5 km from the coastline.

This proven technology is safe, efficient, does not involve hydraulic fracturing (or 'fracking') and has minimal environmental impact. The Victorian moratorium on onshore gas development does not include drilling from onshore to offshore conventional gas reservoirs.

Who approves the VSP project?

An environment plan will be prepared for approval by the Victorian Government Department of Jobs Precincts and Regions, specifically the Earth Resources Regulation division. Consent is also required by the Department of Environment Land Water and Planning in relation to the Victorian *Marine and Coastal Act 2018*.

How have you assessed sound levels?

We engaged world leading underwater acoustic specialists (Jasco Applied Sciences) to carry out sound propagation modelling of the seismic source in the surrounding marine environment. The assessments included potential impacts to people swimming or diving in the vicinity, to marine fauna including whales, and to southern rock lobster (the primary local commercial fishing species). The sound modelling was then used to carry out a formal risk assessment and develop mitigation plans for inclusion in our Environment Plan to be approved by the regulator.

Will there be any impact to surfing?

Although the VSP will be close to some surfing locations, the weather for ideal local surfing conditions at the closest surf break (Two Mile Bay) is most likely to create wave conditions that prevent the operation of the VSP activity. Therefore, we expect little to no impact to surfing at Two Mile Bay. Surfing at the break south of the jetty in Port Campbell may continue as normal at any time during the VSP activity.

Will there be any impact to rock lobster?

The work by Jasco Applied Sciences also included an assessment of the maximum distance from the VSP seismic source in which the southern rock lobster could be exposed to impact levels, and that distance was determined as 150 m. Independent research has found that with the exposure levels predicted for the VSP, there will be no mortalities to southern rock lobster, but there may be some behavioural and biological impacts. However, the potential area of impact is very small, and the time that this exposure will occur is very short.

What about whales?

The timing of the VSP will avoid peak aggregation of southern right whales (May to October) and VSP will not be conducted in April if the Department of Environment Land Water and Planning confirm sightings within 10 km of the survey area.

To further minimise the potential for any impacts to whales, the project will adhere to measures set out in the *Environment Protection Biodiversity and Conservation Act Policy statement 2.1- Interaction between Offshore Seismic Exploration and Whales: Industry Guidelines*. These measures include soft start procedures, using a 3 km observation zone, and a 1 km shutdown zone (which is double the minimum requirement).

A dedicated trained and experienced marine mammal observer will be on board the vessel and observing for marine mammals between dawn and dusk. There will also be operational restrictions at night or low-visibility times if there have been whale sightings.

If you are seeking further information about this project specific to your functions, interests or activities, or wish to provide feedback, please contact us.

Beach Energy invites consultation with stakeholders potentially affected by the VSP activity, including those stakeholders with specific local knowledge or an interest in the environmental performance of this project. Feedback and consultation will inform the development of the Environment Plan.

Contact us

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beachenergy.com.au/vic-otway-basin/

Please be advised that all stakeholder feedback, records of consultation, copies of correspondence, including emails, will be communicated to the regulator in the preparation of the Environment Plan as required by legislation.

