Fact sheet: Seismic surveys

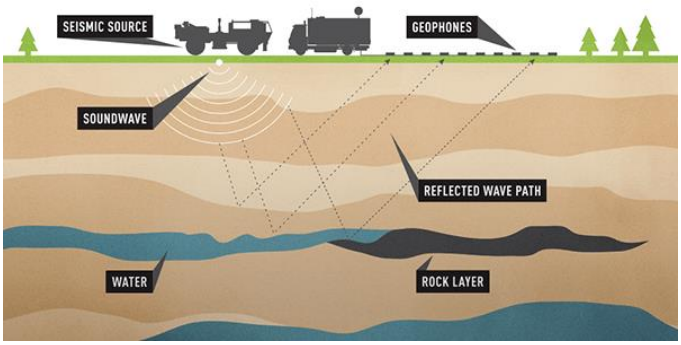
KEY POINTS:

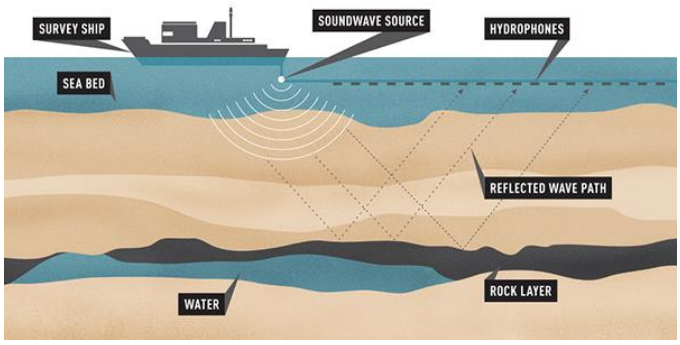
- The oil and gas industry has used seismic surveys for more than 60 years.
- Seismic surveys determine geological features below the earth's surface by bouncing sound waves off various layers of rock and recording the time and strength of the returning sound waves.
- Efficient seismic surveying enables geologists to identify the depth, thickness and shape of subsurface rock formations.
- Seismic surveys use state-of-the-art technology and advanced recording and processing systems to focus the sound waves, process the acquired data, and produce the clearest images possible.

THE FACTS:

Seismic surveys produce detailed images of rock formations thousands of meters beneath the earth's surface. Seismic technology has greatly improved the success rate of exploration wells – decreasing the number of wells that needed to be drilled, as well as the overall cost of exploration.

Seismic sources – such as large vibrating metal plates on land, or compressed air in water – are used to generate sound waves that are bounced off the subsurface rock layers. The returning sound is measured by receivers and then recorded by a device called a seismograph. Analysing the time the waves take to return, and the details of the reflected sound wave spectrum provides valuable information about rock types and about possible gases or fluids in the rock formations.





The information gathered is processed and interpreted by geoscientists who produce computer models of the rock layers. The ultimate product of a seismic survey is a cross section or vertical view of the subsurface.

Seismic surveying is the most reliable form of initial exploration for oil and gas, and is essential in identifying geological features beneath the surface. Efficient seismic surveying minimises the need for exploration drilling and maximises the efficiency and safety of further operations. Detailed seismic surveying also allows geologists to identify the most efficient way of producing a discovered resource, which reduces the number of appraisal and production wells that must be drilled.