

GLOSSARY OF TECHNICAL TERMS

This glossary contains certain definitions of technical terms used in this Prospectus as they relate to us, CNOOC and offshore China. Some of these definitions may not correspond to standard industry definitions. We have also included an explanation of certain terms of technical measurements for your reference.

“2-D”	seismic data collected in two-dimensional form, by utilizing a single sound source and one or more collection points; typically 2-D is used to map geographical structures for initial analysis
“3-D”	seismic data collected in three-dimensional form, by utilizing two sound sources and two or more collection points; typically 3-D is used to acquire refined seismic data and to raise the probability of successful exploration well drilling
“anchor handling towing and supply vessels” or “AHTS vessels”	vessels that are equipped with winches capable of towing drilling rigs and lifting and positioning their anchors and other marine equipment; they range in size and capacity and are usually characterized in terms of horsepower and towing capacity; for offshore China service, anchor handling towing supply vessels typically require 6,000 horsepower or more to position and service semi-submersible rigs drilling in deep water areas
“API gravity”	the American Petroleum Institute’s scale for specific density of liquid hydrocarbons, measured in degrees; the lower the API gravity, the heavier the liquid, and generally, the lower its commercial value; crude oils generally range from 6 degrees (very heavy) to 60 degrees (very light); asphalt has an API gravity of 6 degrees, while WTI has an API gravity of 40 degrees, and gasoline, 50 degrees
“appraisal well”	an exploration well drilled after a successful wildcat well to gain more information on a newly discovered oil or gas reserve
“BHP” or “brake horse power”	brake horsepower, indicating the actual horsepower of an engine delivered at the output end; this is measured on the drive shaft of the engine by a brake or dynamometer
“BOP”	blow-out preventer, utilized beneath a drilling rig and above the surface of the wellbore to seal the well during drilling and control the release of well fluids; a BOP’s capacity to control well pressure is measured in psi
“cantilever”	a structure on a jackup rig which allows the drilling system and derrick to shift out beyond the platform to enable drilling over existing platforms or other structures, as well as greater flexibility for multiple patch well drilling
“casing”	steel pipe that is screwed together and lowered into the well hole after drilling; the casing, along with the cement, provide support to the well bore against surrounding geological pressure so as to maintain wellbore stability

GLOSSARY OF TECHNICAL TERMS

“CLS surface system units”	computerized logging systems units utilized at the surface during logging operations to record and process data
“cluster well”	multiple wells extending in a variety of directions drilled from a single primary trunk wellbore that extends from the surface
“completion fluid”	fluid utilized to maintain downwell pressure and stability while drilling through reservoir rock to minimize damage on the formation’s surface
“crewboats”	boats that transport personnel and time-sensitive items to and from production platforms and rigs; present-day crewboats are generally 130 to 160 feet in length
“crude oil”	crude oil, including condensate and natural gas liquids
“day rate”	fixed daily fee charged with respect to the services provided by a drilling rig or offshore support vessel
“development well”	wells drilled after appraisal wells for production purposes
“directional drilling”	intentional drilling of a well at a non-vertical or deviated angle, in order to improve reach or exposure to petroleum reservoirs; such drilling is especially common for offshore wells, given the multiple number of wells which may be drilled for a single production platform
“drill bit”	the tool attached to the end of the drill string which cuts and bores its way through the rock formations at the bottom of the well
“drill pipe”	steel pipe screwed together by joints which connects the rotary system on the rig to the drill collar and drill bit downwell
“drill string”	the connected column of drill pipe, drill collar and drill bit, which is driven by the rotary system of a rig
“drilling fluids”	fluids, or drilling mud, circulated downwell during drilling to cool and lubricate the drill bit, remove well cuttings, maintain downwell pressures and preserve the integrity of the wellbore; drilling fluids can be water, oil, or gas-based, with various additives
“ECLIPS SM units”	Enhanced Computerized Logging and Interpretative Processing Systems, a registered service mark of Baker Hughes
“exploration block”	a specified area, which is designated under a PSC for exploration activity, with the possibility for development of any potential discoveries
“field”	a specified area within a block, which is designated under a PSC for development and production

GLOSSARY OF TECHNICAL TERMS

“FPSO”	floating production, storage and offloading vessels which are ships fitted with crude oil and natural gas production and processing systems
“fracs”	fractures which are created in the reservoir rock to act as flow channels for the oil and gas to the well; this process can be done either with downwell perforation charges or through high pressured water
“horizontal well”	a well drilled by deviation drilling to achieve an inclination typically greater than 70 degrees. Such wells are drilled into reservoir formations to allow for maximum crude oil recovery and productivity
“HTHP” or “high-temperature and high-pressure”	high-temperature and high-pressure downwell conditions, which typically includes temperatures greater than 200 degrees Celsius and 10,000 psi; HTHP conditions make drilling more difficult
“LWD”	logging-while-drilling; advanced logging tools which are attached near the drill bit string and measure the location of the drill bit and nature of adjacent geological structures, typically during the directional drilling process
“mud pump”	a pump used to circulate the drilling mud on a drilling rig; most rigs typically have two mud pumps, which are rated by their respective hydraulic horsepower
“multilateral wells”	parallel horizontal branch wells drilled at various depths from a single primary trunk wellbore that extends from the surface, allowing drilling into multiple layers of reservoir rock from a single well to increase productivity of a single well
“MWD”	measuring-while-drilling; advanced tools which measure the pitch and orientation of the drill bit and other factors such as weight on the bit and rotary speed of the bit, typically during the directional drilling process
“pay depths”	the vertical sub-surface depth of a petroleum reservoir’s producing area, or pay zone
“petroleum reservoir”	a single continuous deposit of crude oil or natural gas in a porous rock formation
“proved reserves”	estimated quantities of crude oil and natural gas that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known petroleum reservoirs under existing economic and operating conditions (i.e. prices and costs as of the date the reserve estimate is made)

GLOSSARY OF TECHNICAL TERMS

“proved undeveloped reserves”	proved reserves that are expected to be recovered from new wells in undrilled areas, or from existing wells where significant expenditure is required for completion
“PSV”	platform supply vessel used for transporting supplies, such as fuel, water, drilling fluids, cement, equipment and provisions, to offshore drilling and production facilities
“reservoir rock”	subsurface porous rock formations, such as sandstone, limestone and dolomite, in which gas or oil can be found
“rotary system”	the system on a rig which rotates the drill string and drill bit during operations; rotary systems typically are either in the form of rotary tables, which are located on the drilling floor, or in the form of more advanced top drive systems, located in the derrick swivel
“seismic data”	data recorded in either two-dimensional (2D) or three-dimensional (3D) form from sound wave reflections off of subsurface geology; this is used to understand and map geological structures for exploratory purposes to predict the location of undiscovered reserves
“standby vessels”	vessels that typically remain on standby to provide support or safety backup to offshore rigs and production facilities, and are equipped to provide first aid and shelter and, in some cases, may also function as supply vessels
“streamers”	clear flexible tubing containing numerous hydrophones used for marine seismic surveys; streamers are towed behind seismic vessels at controlled shallow water depths to collect seismic data
“top drive”	an electrical rotary motor system built into a suspended swivel, which eliminates the need for a rotary table on the rig floor; top drives provide more efficient and safer drilling by allowing drilling to be done three joints at a time, instead of one, and also by allowing rotation while entering and exiting the wellbore
“utility vessels”	vessels that provide service to offshore production facilities and also support offshore maintenance and construction work; their capabilities include the transportation of fuel, water, deck cargo and personnel; they range in length from 96 feet to 135 feet and may, depending on the vessel design, have enhanced features such as fire fighting and pollution response capabilities
“variable load”	the capacity of excess weight a drilling rig can support; an indication of a rig’s ability to sustain heavier supply loads necessary for deeper drilling

GLOSSARY OF TECHNICAL TERMS

“well completion”	services and installation of equipment that are necessary to prepare a well for production, including casing and well treatment, such as acidizing and fracing
“well workover”	any work on a completed well designed to maintain, restore or improve production from a currently producing petroleum reservoir; this may include replacement of casing and well treatment, such as sand control, fracing, acidizing
“wellbore”	a well hole
“wildcat well”	an exploration well drilled in an area or geological formation that has no known reserves or previous discoveries
“WTI”	West Texas Intermediate crude oil

We also use the following technical measurements. Here is an explanation for your reference.

“bbl”	a barrel, which is equivalent to 158.988 liters or 0.134 tons of oil (at a API gravity of 33 degrees)
“bcf”	billion cubic feet, which is equivalent to approximately 28.3 million cubic meters
“BOE”	barrel-of-oil equivalent
“BTU”	British Thermal Unit, a commonly employed measurement of energy
“DWT”	deadweight tonnage, referring to the total weight in tons of cargo, fuel, crew and other items a vessel can carry when fully loaded; one unit is equivalent to 1,000 kilograms or 2,205 pounds
“km”	kilometer, which is equivalent to approximately 0.6214 mile
“km ² ”	square kilometer, which is equivalent to approximately 0.386 square mile
“kW”	Kilowatts used to measure offshore supply vessel engine power capacity, which is equivalent to 1.36 horsepower
“mmbbls”	million barrels
“mmcf”	million cubic feet
“psi”	pounds per square inch, used to measure air or liquid pressure
“trips”	number of times a logging tool enters and exits a well hole to collect data