



**Encana Corporation
Expression of Interest (EOI)**

HARSH ENVIRONMENT JACK-UP, MOBILE OFFSHORE DRILLING UNIT (MODU)

BIDS Category: 0420
Reference: EOI DC01
Issue Date: May 18, 2017
Closing Date: June 8, 2017

GENERAL

Encana Corporation (Encana) is the owner and operator of the Deep Panuke natural gas project in Nova Scotia's offshore. The project includes facilities required to produce natural gas from the Deep Panuke field, located approximately 175 kilometres offshore Nova Scotia. Natural gas from Deep Panuke is processed offshore and transported, via subsea pipeline, to Goldboro, Nova Scotia for further transport to market via the Maritimes & Northeast Pipeline.

The Deep Panuke project produces natural gas from four (4) subsea wells which is processed through a Production Field Centre (PFC). Each subsea well has its own dedicated flowline and umbilical. The Deep Panuke reservoir fluids contain H₂S and CO₂ which are removed from the fluid stream during processing on the PFC and disposed of into a dedicated subsea acid gas injection well. The sales ready product is exported from the PFC via an export pipeline.

Encana is a leading North American energy producer that is focused on growing its strong portfolio of diverse resource plays producing natural gas, oil and natural gas liquids. By partnering with employees, community organizations and other businesses, Encana contributes to the strength and sustainability of the communities where it operates. Encana common shares trade on the Toronto and New York stock exchanges under the symbol ECA. Further information on Encana Corporation is available on the company's website, www.encana.com. Further information on Deep Panuke is available at www.encana.com/deeppanuke

SCOPE OF WORK

Encana is seeking qualified companies interested in providing a Harsh Environment Jack-Up, Mobile Offshore Drilling Unit (MODU) capable of working in 30 – 65 meters of water at the Deep Panuke field location offshore Nova Scotia, Canada. Environmental data and technical requirements for the MODU are summarized in Appendix One attached to this Expression of Interest.

The MODU is required to support the Plug and Abandonment (P&A) of four (4) subsea sour gas production wells and one (1) subsea acid gas injection well, across the five (5) subsea well locations. All subsea wells are equipped with a subsea tree which will be recovered by the MODU for relocation to Encana's shorebase facilities in Dartmouth, Nova Scotia. The subsea wells were first converted to subsea wellheads through the existing mudline suspension system prior to running the subsea tree. The horizontal subsea production trees are approximately (3m x 3m in dimension with each weighing approximately 50MT). In addition, a high-pressure riser will be installed and tied back to a conventional surface BOP stack on the MODU.



P&A activities will be executed from the MODU and will include tubing/control line recovery, wireline, coiled tubing, section milling and cementing operations. These services will be provided by other service providers under contract to Encana.

Respondents to this Expression of Interest may also propose alternatives to a MODU that would be capable of supporting the P&A activities in the offshore Nova Scotia area. Any alternative proposal should include sufficient detail to allow for an assessment of the proposed solution and technology, including performance history and references. Although Encana will review alternative proposals, it is under no obligation to include respondents with alternative solutions on any bidders list resulting from this Expression of Interest.

Schedule for the Work:

No date for cessation of production of the Deep Panuke field has been identified.

Encana is issuing this Expression of Interest to identify the availability of suitable equipment and services to conduct the work in the offshore Nova Scotia location during the 2019-2021 timeframe. The preferred window for carrying out the work is between the months of May and September. Any decisions on specific timing will be made at a later date.

Responses to this Expression of Interest must contain the following information:

- A: Confirmation of the MODU availability (identifying the time period(s) that the MODU would be available for the Work), current location and present contract status of proposed MODU.
- B: Detailed specifications for the MODU, including but not limited to, dimensioned drawings of laydown areas and proposed arrangements to accommodate IWOCs deployment/recovery and umbilical support, ROV deployment/recovery and umbilical support, subsea tree recovery and handling, coiled tubing and wireline equipment.
- C: Confirmation of North Atlantic harsh weather experience including references to previous projects similar to the Work.
- D: A duly completed Pre-Qualification Questionnaire.

GENERAL REQUIREMENTS

Technical requirements for the MODU are included in Appendix One attached to this Expression of Interest.

EOI respondents are required to have an implemented Quality Management System that complies with the requirement of the ISO-9000 series of Standards and Safety Management System(s). Respondents are also notified that the Work carried out on the Deep Panuke Project shall comply fully with Canada Nova Scotia Offshore Petroleum Board Regulations and all regulatory requirements.



Respondents must submit a brief Company profile, contact details, key personnel for land and offshore support and a summary of related experience including local Nova Scotia capabilities.

Encana is committed to providing opportunities for Nova Scotian and Canadian companies through employment, procurement and contracting on an internationally competitive basis, with full and fair opportunity for Nova Scotians and Canadians where competitive on a best value basis, and first consideration to Nova Scotians. Pre-qualified companies will be required to complete a Canada–Nova Scotia Benefits Questionnaire, and demonstrate their commitment to and compliance with Encana’s requirements regarding Canada–Nova Scotia Benefits, during the tender process.

Interested firms are requested to demonstrate their capabilities and experience via a formal response to this EOI and the **Prequalification Questionnaire**, which can be obtained from the email address provided below.

Encana will select qualified bidders using the respondents to this EOI as a guide. Any eventual list of Bidders will be posted on the Encana website website and other industry websites such as BIDS Nova Scotia.

Encana is under no obligation to proceed with a Request for Proposal as a result of this Expressions of Interest. Only those respondents deemed acceptable by Encana will be invited to participate in the event Proposals are solicited.

Expressions of Interest must be received on or before **Thursday, June 8, 2017, 1:00 PM** Atlantic time.

All inquiries and Expression of Interest must be clearly marked with the EOI reference number and should be directed to:

John F. Nowlan, P.Eng.
Senior Contract Specialist
Deep Panuke Project
Suite 700, Founders Square
1701 Hollis Street
Halifax, Nova Scotia, Canada B3J 3M8

Tel: 902-492-5415 / Fax: 902-492-5255
Email: john.nowlan@encana.com



APPENDIX ONE
TECHNICAL REQUIREMENTS FOR MODU

The MODU will meet the following criteria:

1. Capable of working year-round in the general Sable Island area of Nova Scotia, Canada.

Seasonal temperature in this area ranges of -20C to +35C, average annual snowfall amounts of ~1.2m and the following environmental load conditions:

Wind Statistics at Deep Panuke

Parameter	1 year	10 year	100 year	Other
WINDS				
1-hr wind speed at 10 metres above MSL (m/s)	27.1	35.8	41.6	-
1-min wind speed at 10 metres above MSL (m/s)	28.5	37.6	43.7	-
3-second gust speed at 10 metres above MSL (m/s)	36.3	48.0	55.7	-
Upper 95% wind speed at 10 metres above MSL for all directions (m/s)	-	-	-	13.9
Upper 95% wind speed at 10 metres above MSL for NE, E, SE sectors combined (m/s)	-	-	-	14.0
Annual Mean Wind Speed at 10 metres above MSL (m/s)	-	-	-	7.9

Wave Statistics at Deep Panuke

Parameter	1 year	10 year	100 year
Significant wave height (Hsig) (m)	9.3	11.5	13.7
Maximum wave height (Hmax) (m)	17.5	21.5	25.6
Peak period associated with Hsig (Tp) (sec)	12.6	14.8	17.0

Seaspray and Atmospheric Icing criteria

The Deep Panuke field is located in the designated area of Eastern Canadian waters where severe ice accretion is expected to occur. This phenomenon is seasonal and its severity depends on the combination of wind speed and air temperature.

Expected Ice Accretion at Deep Panuke Location

Height above sea level m	Seaspray Icing*		Atmospheric Icing*	
	Thickness mm	Density kg/m ³	Thickness mm	Density Kg/m ³
5.0 – 10.0	80	850	10	900
10.0 – 25.0	Linear reduction from 80 to 0	Linear reduction from 850 to 500	10	900
Above 25.0	0	0	10	900

*Annual probability of exceedance 10⁻²

2. Ensure stability on a firm sand sea floor.

Well locations comprising the Deep Panuke field are characterized by a hard, sandy seafloor. Estimated initial spud can penetration can be expected to be less than two metres.

Predicted Design Soil Strength Profile

Soil Unit	Soil Type	Top Depth (m)	Bulk Unit Weight (kN/m ³)	Cone Tip Resistance q _c (MPa)	Sleeve Friction f _s (MPa)	Internal Angle of Friction Φ' (deg)	Undrained Shear Strength S _u (kPa)
A	Sand	0.0	19.5	30	0.2	43	N/A
B	Clay	19.5	20.5	5	0.4	N/A	200
C	Sand	22.5	19	18	0.15	41	N/A
D	Clay	27.0	18	7	0.15	N/A	180

3. Capable of deploying, recovering and supporting continuous operations of an IWOCs basket and the associated control umbilical.
4. Capable of providing helideck facilities with refueling capabilities, to accommodate an S-92 airframe.
5. Capable of modifications necessary to conduct an Annular Velocity Controlled (AVC) work program. The MODU must be equipped with an 18-3/4" 10,000psi BOP system. To be AVC capable, the MODU will require the installation of a rotating BOP (RBOP) and associated equipment between the BOP and Diverter Housing.
6. Capable of providing a primary and secondary riser tensioning deck and system capable of pulling at least 700 kips tension in the 18-3/4" high pressure riser.



7. The MODU shall meet Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) Certificate of Fitness Regulations prior to commencing operations in Nova Scotia waters (see www.cnsopb.ns.ca), and be issued a Certificate of Fitness by a recognized Certifying Authority.

8. All personnel and equipment must be qualified and certified to meet the Canadian Association of Petroleum Producers (CAPP) requirements for working offshore Nova Scotia, including but not limited to, the “Atlantic Canada Offshore Petroleum Industry Standard Practice for the Training & Qualifications of Personnel” requirements for working offshore Nova Scotia (see www.capp.ca/publications-and-statistics/publications/223065) and the “Atlantic Canada Offshore Safe Lifting Practices” (see www.capp.ca/publications-and-statistics/publications/226080).