

# Well Control Strategy

## Orphan Basin Exploration Project 2023

### BP Canada Energy Group ULC



#### Project Information - Overview

BP Canada Energy Group ULC (“bp”) has contracted the Stena IceMAX drillship to drill an exploratory well on licence EL1168 in the West Orphan Basin. The well is located approximately 395 kilometres northeast of St. John’s and will be drilled in a water depth of approximately 1340 metres to evaluate the potential of oil-bearing rock formations. The anticipated duration of this well is 60 to 120 days, depending on evaluation of formations. Drilling is expected to commence in May 2023. Well construction activities completed during this program will be performed in accordance with the Canada - Newfoundland & Labrador Offshore Petroleum Board (C-NLOPB) regulations.

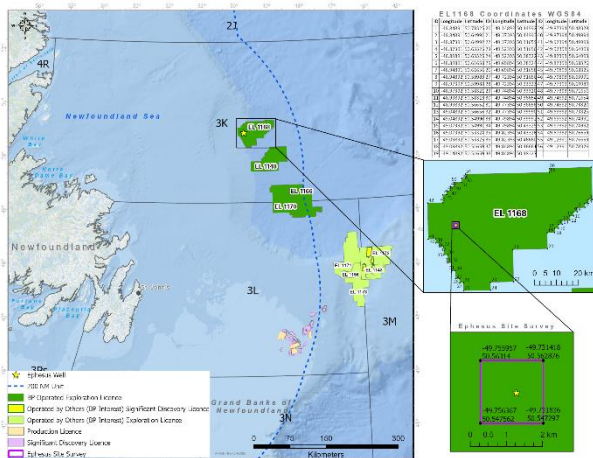


Figure 1: Ephesus F-94 Well Location



Figure 2: Stena IceMAX Drillship

#### Well Barriers and Documentation

bp’s well control planning and operational execution is focused on the prevention of well control incidents. This will be accomplished through robust well planning and ensuring well barrier envelopes are maintained during all phases of operational activity. Well barrier envelopes consist of one, or several, well barrier elements designed to prevent wellbore influxes from unintentionally flowing from the formations.

The primary well barrier element for all planned operations is a stable column of drilling fluid with a sufficient density to overbalance the formation pressures. In addition to ensuring the drilling fluid always overbalances the formation pressures, several other measures will be taken to prevent well control events. This includes, but is not limited to, the following:

1. Frequent drilling fluid property checks by qualified personnel to verify the planned properties are maintained.
2. Continuous, independent drilling fluid volume monitoring in the wellbore and associated rig holding tanks by multiple, qualified personnel.
3. Frequent pressure testing of well barriers.
4. Frequent practical well control drills will be held to ensure the rig crew is trained and prepared to manage a potential well control event. These drills will be in accordance with company/industry standards and regulatory requirements.
5. Additional well barrier(s) will be placed in the wellbore in the case of a planned riser disconnect such as for ice, or a weather event.
6. Clear roles and responsibilities for individual rig crew for monitoring and communicating well control events.

The secondary barrier envelope is formed by the casing, cement, wellhead, blow-out preventer (BOP), etc. These barrier elements will be verified and functional.

The well integrity and barrier envelope philosophies are consistent with company standards, C-NLOPB regulations and international industry standards. bp and Stena have separate well control policies that will be combined into a project specific Joint Operations Manual (JOM). These documents provide further guidance for the measures addressed above, as well as other items integral to well control. The documentation is distributed to the rig crew to ensure adherence to the policies as well as understanding of the individual roles and responsibilities.

### **Well Control Incident Mitigation Strategy**

While the main objective is to prevent well control incident occurrence, there are plans to manage a wellbore influx should it occur and to prevent incident escalation. The well control documents provide information which empowers the rig crew to focus on maintaining primary well control throughout all planned operations, but also includes direction on safely managing any wellbore influxes. bp also has a Well Control Response Guide which outlines the processes and resources available to manage incidents.

Early detection and control of a wellbore influx is a key requirement, and the personnel responsible will be trained and familiar with their duties so that operations can proceed safely. In addition, bp's well monitoring policies and procedures will be followed as well as additional remote monitoring with clearly defined alarm settings and hold points.

In the event of a loss of primary well control, the wellbore influx will be managed by shutting in the BOP via the rig surface well control system, securing the well and circulating out the influx.

### **Source Control - Additional Solutions, Equipment and Strategies**

In the event the rig surface activated BOP closing is unsuccessful, there are other measures available to close the BOP that includes ROV intervention, acoustic signaling and autoshear-AMF (Automatic Function Mode) which should seal the wellbore.

bp has also prepared for an unlikely well control event which leads to the loss of both primary and secondary well control that would result in additional resource and equipment mobilization. bp is a member of OSRL (Oil Spill Response Limited) which has access to specialized well control

equipment which would be mobilized to the well location from various international locations upon call out. This additional equipment includes, but is not limited to, site survey equipment, debris clearance equipment, subsea dispersant products, and capping stack equipment. bp also has other frameworks in effect, which includes a capping and containment plan, an oil spill response plan, and an ROV intervention plan.

In addition, bp will identify rigs which could be used to drill a relief well and the key equipment (i.e., casing, wellheads, etc.) which would be used and available for mobilization upon call out. bp has also identified subject matter expert personnel resources and has an organization structure in place to move the required equipment to the well location and execute the relief well drilling.



*Figure 3: Well Control Capping Stack*