Project Description
BHP Canada Exploration Drilling Project EL 1157 and 1158 Seabed Survey

BHP

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

Abbreviations and Acronyms

AUV	Autonomous Underwater Vehicle
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
DP	Dynamic Positioning
EA	Environmental Assessment
ECSAS	Canada Wildlife Service Eastern Canada Seabirds at Sea
EL	Exploration Licence
ESRF	Environmental Studies Research Fund
FSC	Food, social, or ceremonial
HSEC	Health, Safety, Environment and Community
MARPOL	The International Convention for the Prevention of Pollution from Ships
NAFO	North Atlantic Fisheries Organization
SARA	*Species at Risk Act*
SBA	Significant Benthic Area
ROV	Remotely Operated Vehicle
VSP	Vertical Seismic Profiling

1.0 INTRODUCTION

BHP Canada (BHP) is planning to conduct petroleum exploration drilling and related activities on Exploration Licences (ELs) 1157 and 1158 in the Orphan Basin, with an initial well planned as early as 2021. ELs 1157 and 1158 are in the Eastern Newfoundland offshore region of the Canada-Newfoundland and Labrador Offshore Area (Figure 1.1). BHP is planning a visual survey of the seabed using a remotely operated vehicle (ROV) or autonomous underwater vehicle (AUV) at potential drilling locations within ELs 1157 and 1158 to characterize benthic conditions (the "Project"). These surveys will support planning and mitigation for BHP's planned drilling program. The proposed Project Area includes ELs 1157 and 1158 (and a 10 km buffer), with BHP as the operator and sole shareholder. The specific location of the seabed survey(s) in a given year will be focused on the upcoming planned well location(s). Well locations are not known at this time and could occur anywhere within ELs 1157 and 1158 over the life of the Project (Section 2.3).

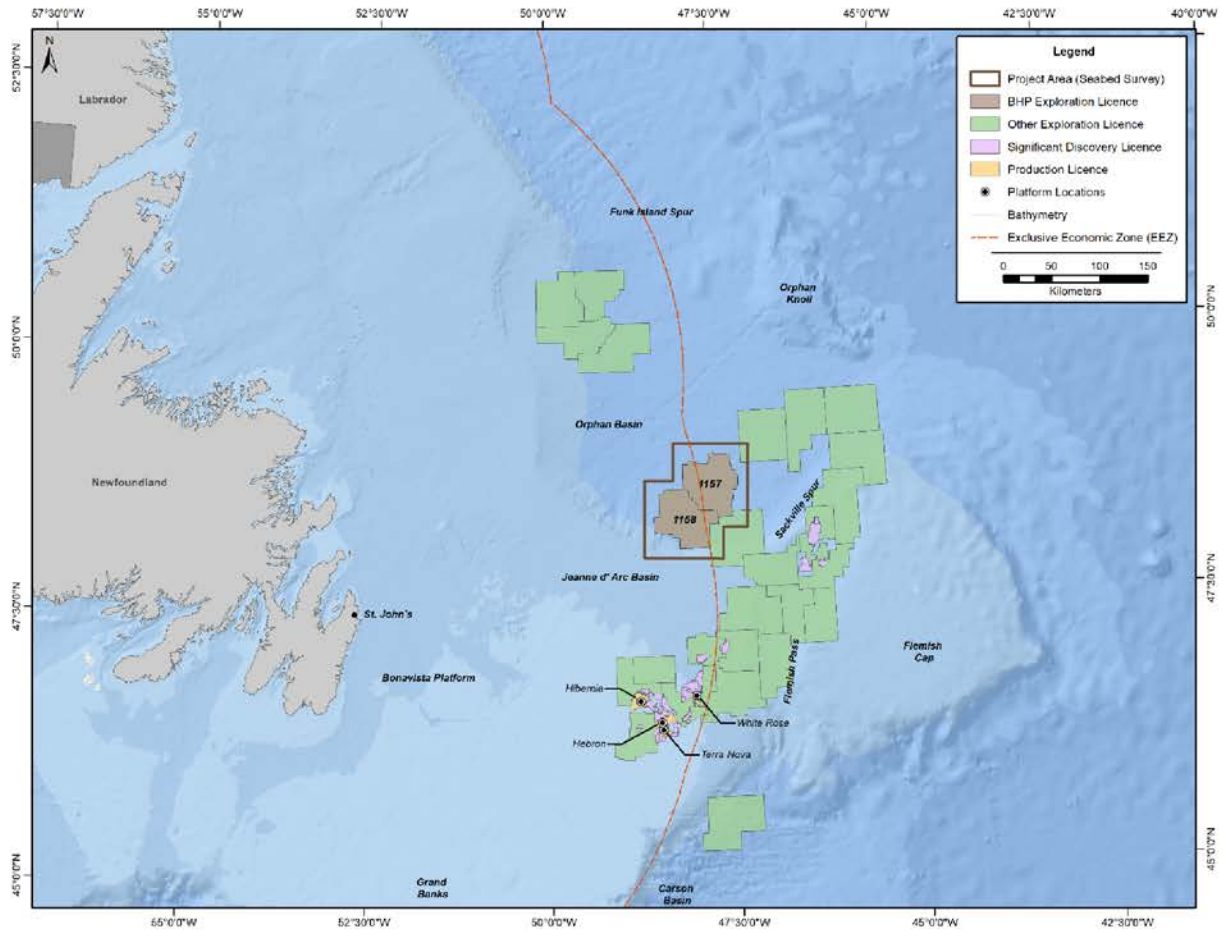

Figure 1.1 Location of Project Area for BHP Seabed Survey

Introduction
August 27, 2019

The Project will require an authorization as an environmental program from the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) pursuant to section 138 of the federal *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*, and section 134 of the provincial *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (collectively referred to as the Accord Acts). Separate environmental assessment (EA) and authorization processes are being carried out for BHP's proposed exploration drilling program.

This document is a Project Description for the seabed survey and is being submitted to the C-NLOPB to initiate the EA process. It has been prepared and submitted as per the Geophysical, Geological, Environmental and Geotechnical Guidelines (C-NLOPB 2019) and will allow the C-NLOPB to both confirm EA requirements and to provide a Scoping Document to inform the planning, preparation, and submission of the Project's EA report.

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW AND RATIONALE

BHP is proposing a seabed survey at potential drilling locations on ELs 1157 and 1158 to confirm the presence / absence of sensitive biological communities (e.g., corals and sponges). Portions of ELs 1157 and 1158 occur within the Northeast Newfoundland Slope Closure, a marine refuge area which was designated in December 2017. This closure area is designated to protect corals and sponges and is closed to bottom-contact fishing (DFO 2019). While exploration drilling is not prohibited within the marine refuge, BHP has committed to gathering baseline benthic data at prospective well locations prior to spudding the well to understand potential site sensitivities and opportunities for reducing potential environmental effects on corals and sponges.

BHP is proposing to conduct the survey and share results with the C-NLOPB and Fisheries and Oceans Canada (DFO) to inform discussions around well planning and mitigation for future exploration drilling.

2.2 PROJECT LOCATION

The Project Area (Figure 1.1) is located within the Orphan Basin and is approximately 15,775 km^2. The western boundary is approximately 350 km east of St. John's, NL. Water depths within ELs 1157 and 1158 range from 1,175 m to 2,575 m. The seabed survey will be conducted at potential drilling locations within ELs 1157 and/or 1158 (Figure 1.1). Specific survey locations have not yet been determined, as well locations have not yet been selected, but will be located within these two ELs.

2.3 SCHEDULE

The initial seabed survey is planned to be conducted within ELs 1157 and/or 1158 between May and October 2020 pending authorization from the C-NLOPB; however, seabed surveys could be conducted between 2020 and 2025 at any time of the year. Anticipated survey duration will be approximately 7 to 10 days. However, the surveys could be as long as 30 days depending on factors such as scope and weather conditions.

2.4 PROJECT COMPONENTS AND ACTIVITIES

2.4.1 Data Collection

The survey plan for each prospective well location will be designed based on the results of cuttings dispersion modeling being completed for BHP's upcoming exploration drilling EA (i.e., the survey plan will be designed to cover the portion of the seafloor likely to be affected by drill cuttings dispersion as determined by the results of the modeling).

Video or photographic data will be collected during the survey using either a work-class tethered ROV or an AUV. Both ROV and AUV are capable of conducting a visual survey of the seabed for the purpose of

describing the benthic environment, specifically the presence / absence of sensitive biological communities such as corals and sponges. However, as described below, the method in which visual data is collected differs between the ROV and AUV.

The execution of a survey plan differs between ROVs and AUVs. An ROV is connected to the survey vessel by an umbilical and is operated remotely by a "pilot" who follows the survey plan. The umbilical transmits real-time data to the pilot who controls the ROV's speed, depth, angle, and other features, such as video or photo collection. An AUV is deployed to execute a pre-programmed survey plan (location, depth, height from seabed, angle) without a real-time pilot. When the pre-programmed mission is complete, the AUV returns to a pre-defined location on the surface where the unit can be recovered, and data downloaded for processing.

The ROV / AUV will be mounted with a camera system capable of collecting high-definition visual data. The ROV / AUV will be operated at a predetermined height off the seabed to maximize field of view, while maintaining image resolution and the ability to identify small-scale seabed features (e.g., corals, sponges). A laser measuring device will be used to measure the dimensions of seabed features, and a sector scanning sonar will be used at predetermined intervals along each transect to help identify features that may be beyond the field of view of the camera, but that protrude from the surrounding seabed. The position of the ROV / AUV will be recorded and tagged to the imagery such that the approximate location of features will be documented. The camera system mounted on an ROV will be capable of collecting high-resolution video data, while the camera system mounted on an AUV will collect still images that will be stitched together to form a photomosaic of the seabed.

The visual data collected by the ROV / AUV will be reviewed by a marine biologist. ROV video data will be recorded, but can also be viewed in real-time by marine biologists located either on-board the vessel or on-shore via a live feed. Species and features of interest can be reviewed in real-time and the survey plan modified as necessary. Modifications may include stopping for further investigation of species, zooming in to investigate small-scale seabed features, or deviating from the intended transect to investigate features of interest in greater detail. AUV image data will be downloaded from the unit upon completion of the survey. Once downloaded, the images will be processed and assembled into a georeferenced photomosaic of the seabed that will be reviewed by a marine biologist for identification of seabed and habitat features and organisms.

Both ROV and AUV will provide the information on seabed conditions and presence of sensitive features (i.e., corals and sponges) required for the purpose of well planning and mitigation for future exploration drilling. The selection of ROV or AUV will be based on a variety of factors including discussion with regulators, vessel / system availability and other contracting requirements.

While the focus of the Project is to identify sensitive environmental seabed features, anthropogenic features and other potential geohazards in the vicinity of prospective well locations that could potentially affect planning will also be recorded. This will serve as ground truthing for geohazard identification completed using existing seismic data.

2.4.2 Vessel Selection

BHP will contract a survey vessel equipped with the appropriate systems and the necessary procedures to meet the operational requirements to complete the work safely. The survey vessel will be capable of working in harsh offshore conditions. It will have the necessary equipment, protocols, and procedures in place to comply with applicable standards including the *Canada Shipping Act* and the International Convention for the Prevention of Pollution from Ships (MARPOL). Before initiating Project-related work, the vessel will be inspected by Transport Canada and approved for operation by the C-NLOPB.

Vessel requirements will be specific to the final survey technique selected. If it is determined that an ROV will be used to conduct the seabed survey, the selected vessels will be required to have a dynamic positioning (DP) system. DP is not required for use of an AUV.

The survey vessel will be mobilized from an existing shore-base in Atlantic Canada. Once the vessel has arrived at a pre-determined survey location (i.e., prospective well location), the ROV / AUV will be lowered into the water from the survey vessel and operated from the survey vessel by a qualified operator. If an ROV is used to collect data, the survey vessel will be required to use DP to remain on station during the seabed survey to maintain georeferencing of the data collected. DP will not be required for use of an AUV, as the AUV operates independently from the vessel (see Section 2.4.1).

2.4.3 Environmental Management

Potential environmental effects associated with the Project will be managed through standard and recognized mitigation measures. Survey vessels will generate sound emissions (underwater and atmospheric), atmospheric emissions (light and air emissions), and solid and liquid waste. Liquid waste (e.g., grey water, sewage, bilge water, deck drainage) will be managed in accordance with the requirements of MARPOL and the *Canada Shipping Act*. Solid and domestic waste will be collected on the vessel and transferred dockside by an approved waste contractor for recycling / disposal at an existing onshore waste management facility in accordance with applicable regulatory requirements.

Additionally, environmental effects associated with the Project will be reduced through the implementation of the following mitigation measures:

- Lighting on the survey vessel will be limited at night to the extent that it does not affect crew / vessel safety
- The survey vessel will avoid transiting within 300 m of migratory bird nesting colonies during the nesting period and will comply with provincial *Seabird Ecological Reserve Regulations, 2015* to reduce disturbance to colonies
- During transit to the Project Area, the survey vessel will travel at a vessel speed not exceeding 22 km/hour (12 knots), except as needed in the case of an emergency. If a marine mammal or sea turtle is detected in proximity to the vessel, vessel speed will be reduced to avoid collision
- In the unlikely event of a collision with a marine mammal or sea turtle (i.e., incident), BHP will contact the Canadian Coast Guard within 24 hours following the collision. The reporting of any incident is under the jurisdiction of DFO. The Master of the vessel involved in the collision is responsible for reporting the incident. DFO requires that the “Marine Mammal Interaction Form” be completed following an

incident and submitted to DFO by email. If the incident involves a live mammal, DFO requires a call be placed immediately to the regional response network. The Master of the vessel involved in the collision will also report the incident to BHP, who will notify the C-NLOPB in accordance with the Incident Reporting and Investigation Guidelines

- BHP will communicate the timing and location of the seabed survey to Indigenous groups and commercial fisheries stakeholders prior to mobilization

Additional mitigation measures may be implemented following consultation and engagement activities.

A seabird and marine mammal observation program will be conducted for the duration of the seabed survey (including transit to and from the Project Area) by a designated observer trained in marine mammal and seabird observations using the following standard protocols:

- The marine mammal monitoring protocol will be conducted in accordance with Environmental Studies Research Fund (ESRF) Report "Recommended Seabird and Marine Mammal Observation Protocols for Atlantic Canada" (Moulton and Mactavish 2004)
- The seabird monitoring protocol will follow the "Canada Wildlife Service Eastern Canada Seabirds at Sea (ECSAS) Standardized Protocol for Pelagic Seabird Surveys from Moving and Stationary Platforms" (Gjerdrum et al. 2012)

2.5 PROJECT LOGISTICS AND PERSONNEL

BHP will procure a qualified contractor to supply the survey vessel and conduct the Project. In addition to the contracted vessel crew (which will depend on the size of the vessel and could range from 25 to 40 individuals), it is anticipated that there could be an additional 8 to10 individuals on board including BHP representatives and marine biologists.

Logistical and support activities required for the surveys will depend on the survey company contracted, which may vary over the temporal scope of the Project. It is anticipated that vessels will use existing third-party shore-base facilities in eastern Newfoundland to mobilize for the survey, however it is possible that mobilization could occur elsewhere in Atlantic Canada. Given the length of a survey (anticipated to be approximately 7 to 10 days, with the potential of extending to 30 days), it is expected that a survey will be completed in a single mobilization (apart from weather or mechanical downtime). There could be multiple mobilizations for surveys over the temporal scope of the Project.

Resupply and crew changes are not anticipated during a single survey. However due to contracting, survey crew may change over the life of the Project.

3.0 HEALTH, SAFETY, ENVIRONMENT, AND COMMUNITY

Sustainability is one of the core values set out in the BHP Charter (Figure 3.1). To BHP, sustainability means putting health and safety first, being environmentally responsible, and supporting communities. The wellbeing of BHP's people, the community, and the environment is considered in everything that it does.

Recognizing that BHP's operations can impact the health of its people, BHP sets clear requirements to manage and protect the health and wellbeing of its workforce, now and into the future. BHP looks to create a culture of care and trusted relationships with its people through strong leadership and open communication.

BHP aims to limit the environmental effects from its activities and work in partnership with others to support environmental resilience.

BHP seeks to build good relationships with its stakeholders based on mutual respect, open and ongoing communications, and transparency over its activities. BHP supports the development of diversified and resilient local economies that contribute to improved quality of life beyond the life of BHP's operations.

"Our Requirements" are the standards that give effect to the mandatory requirements arising from the BHP Operating Model as approved by the Executive Leadership Team. Our Requirements describe the mandatory minimum performance requirements and accountabilities for Group-wide Health, Safety, Environment, and Community (HSEC)-related performance requirements, business obligations, processes, functions, and activities across BHP. More Information about BHP's "Our Requirements" is provided in Table 3.1.

BHP

Our Charter

We are BHP, a leading global resources company.

Our Purpose

To bring people and resources together to build a better world.

Our Strategy

Our strategy is to own and operate large, long-life, low-cost, expandable, upstream assets diversified by commodity, geography and market.

Our Values

Sustainability
Putting health and safety first, being environmentally responsible and supporting our communities.

Integrity
Doing what is right and doing what we say we will do.

Respect
Embracing openness, trust, teamwork, diversity and relationships that are mutually beneficial.

Performance
Achieving superior business results by stretching our capabilities.

Simplicity
Focusing our efforts on the things that matter most.

Accountability
Defining and accepting responsibility and delivering on our commitments.

We are successful when:

Our people start each day with a sense of purpose and end the day with a sense of accomplishment.

Our teams are inclusive and diverse.

Our communities, customers and suppliers value their relationships with us.

Our asset portfolio is world-class and sustainably developed.

Our operational discipline and financial strength enables our future growth.

Our shareholders receive a superior return on their investment.

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Andrew Mackenzie
Chief Executive Officer

May 2019

Figure 3.1 The BHP Charter

Table 3.1 Our Requirements

Our Requirements for Aviation	Provides the framework for aviation relating to safety expectations, technical requirements, and a common set of critical controls.
Our Requirements for Business Conduct	Our Requirements for Business Conduct support Our Charter and the Code of Business Conduct and sets out what we all need to do to meet our ethical and legal obligations.
Our Requirements for Communications, Community and External Engagement	Provides the framework for engaging with our stakeholders in a consistent way including government, media, employees, equity analysts, investors and host communities, and is essential to build, protect and enhance our reputation, license to operate and meet regulatory requirements.
Our Requirements for Risk Management	Provides the framework for risk management relating to climate change and material health, safety, environmental, and community risks.
Our Requirements for Environment and Climate Change	Provides the framework for demonstrating our environmental responsibility by minimizing impacts and contributing to enduring environmental benefits.
Our Requirements for Health	Provides the framework for Health relating to protecting our employees and contractors' health from workplace exposures.
Our Requirements for Health, Safety, Environment and Community Event and Investigation Management	Provides the framework for reporting events, conducting quality investigations and sharing and applying investigation lessons, to eliminate repeat events in our business and close identified gaps in our Health, Safety, Environment and Community (HSEC) framework.
Our Requirements for Health, Safety, Environment and Community Reporting	Provides the framework for reporting, relating to identification and reporting data, that reflects our impact on the supporting workforce and environment.
Our Requirements for Information Governance and Controlled Documents	Provides the framework for effectively managing records and information.
Our Requirements for Internal Audit	Provides the framework for Internal audits managed by Risk Assessment and Assurance to give assurance to the C-NLOPB, CEO and Executive Leadership Team on the effectiveness of our governance, risk management, and internal control environment.
Our Requirements for Safety	Provides the framework for keeping our people safe.
Our Requirements for Security and Emergency Management	Provides the framework for crisis and emergency management planning.
Our Requirements for Supply	Provides the framework for managing goods and services throughout a project lifecycle.

Recognizing that BHP's operations can impact the health of its people, BHP sets clear requirements to manage and protect the health and wellbeing of its workforce, now and into the future. BHP looks to create a culture of care and trusted relationships with its people through strong leadership and open communication. Additionally, BHP aims to reduce the environmental impacts from its activities and work in partnership with others to support environmental resilience.

BHP seeks to build good relationships with its stakeholders based on mutual respect, open and ongoing communications, and transparency regarding its activities. BHP supports the development of diversified

and resilient local economies that contribute to improved quality of life beyond the duration of BHP's operations.

BHP's ability to be a safe and responsible operator depends, in part, on the capability and performance of its contractors and suppliers. BHP's contract(s) for this work will include clear, consistent information, and will specifically detail BHP's expectations. The contract(s) will be awarded following a selection process that considers multiple factors including safety, technical quality, and cost. Contractors and subcontractors (where applicable) will be required to demonstrate conformance with BHP's requirements including HSEC standards and mitigative commitments.

4.0 INDIGENOUS AND STAKEHOLDER CONSULTATION

BHP is committed to engaging with Indigenous groups and other stakeholders. As part of Indigenous and stakeholder engagement that has been conducted for its exploration drilling project, BHP has communicated the intent to conduct a seabed survey prior to drilling to identify sensitive environmental features.

The proposed survey plan, including timing and location, will be communicated to Indigenous groups and other stakeholders. Survey results will be shared with Indigenous groups and other stakeholders as part of the BHP's overarching engagement efforts. BHP will also share seabird and marine mammal observation data collected during the survey upon request.

5.0 ENVIRONMENTAL SETTING

The Project Area occurs in the Eastern Newfoundland offshore area, a diverse ecosystem that contains highly productive and sensitive marine fish, marine mammals, sea turtles, marine birds, and benthic communities. Several species that could potentially occur in the Project Area have either been listed as species at risk under the federal *Species at Risk Act* (SARA) and/or identified as species of conservation interest by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Structure-forming benthic invertebrates occur in the Orphan Basin and surrounding areas, including corals, sponges, and sea pens (Amec 2014). DFO has defined a number of Significant Benthic Areas (SBAs) along the Northeast Newfoundland Shelf that contain corals, sponges, and/or sea pens as a dominant and defining feature (DFO 2017); a SBA for sea pens has been established along the edge of the Northeast Newfoundland Shelf that overlaps the southwestern margin of EL 1158. Additionally, the Northeast Newfoundland Slope Closure (a designated marine refuge closed to bottom-contact fishing to protect corals and sponges) (DFO 2019) encompasses portions of ELs 1157 and 1158.

The assemblage of fish species in the Project Area varies considerably based on several factors including the diverse marine environment within the Project Area, which includes parts of the Orphan Basin slope and deepwater habitats. Within these areas and associated habitat types, a variety of fish species occur with distinct “slope” assemblages (which include Greenland halibut, roughhead grenadier, and wolffish) and “deep slope-abyssal” assemblages (which include lanternfish, grenadiers, blue hake, dogfish). Within such depth zones, habitat complexity can also be a determining factor of species presence and prevalence (Amec 2014; Amec Foster Wheeler 2018; Stantec Consulting 2018). DFO research vessel survey data (2015 to 2016) indicated the most abundant fish species in the Project Area included redfish, Greenland halibut, roughhead grenadier, roundnose grenadier, witch flounder, and northern wolfish. These species are expected to be present in the Project Area year round. ROV surveys and baited camera studies in the Orphan Basin have identified rabbit fish, blue hake, abyssal grenadier and rockling at approximately 2,338 m depth (d’Entremont et al. 2008). Blue hake, grenadiers, rattails, rocklings, deepwater skate, cutthroat eel and deepwater arrowtooth eel have also been observed during an ROV survey at 2,600 m (Drover 2012 in LGL Limited 2013). The Project Area may overlap with proposed critical habitat for northern and spotted wolffish; both species are listed under SARA Schedule 1 as threatened (Kulka et al. 2007)

Seabirds nest along the coasts of eastern and northeastern Newfoundland and forage on the Grand Banks and adjacent areas during and following the nesting season. In the summer, most of the world’s population of great shearwater and large numbers of sooty shearwater nesting in the South Atlantic are thought to migrate to Newfoundland waters. Leach’s storm-petrels traverse the continental shelf to forage for nestlings in deep waters off the shelf in areas such as the Orphan Basin, which is the nearest deep-water area to the largest nesting colony in the world of this species at Baccalieu Island. In the Orphan Basin, seabird aggregations are low (1 to 10 birds/km^2) to moderately high (10 to 100 birds/km^2) from November to February, and moderately high from March to August with fewer occurrences in September to October (Fifield et al. 2009). In particular, Northern fulmars, storm-petrels and shearwaters are common on the southern edge of the Orphan Basin during the summer (Fifield et al. 2009).

Up to 20 marine mammal and several sea turtle species occur off eastern Newfoundland including a number of baleen whales (mysticetes), toothed whales and porpoises (odontocetes) and seals (pinnipeds). Endangered leatherback and loggerhead sea turtles may potentially occur within or near the Project Area, although their presence would be rare.

The Project Area is located within North Atlantic Fisheries Organization (NAFO) Management Area 3L and Unit Area 3Le, as well as other fisheries resource management areas. Key species fished in eastern Newfoundland waters include snow crab, redfish, Northern shrimp, turbot / Greenland halibut, American plaice, yellowtail flounder, Atlantic halibut and others. Fishing activity occurs year-round but is mainly concentrated in the May to July period. However, with the December 2017 closure of the Northeast Newfoundland Slope Marine Refuge to bottom fishing, there will likely be very little fishing activity in the Project Area going forward.

BHP is not aware of food, social or ceremonial (FSC) fishing or harvesting occurring within the Project Area but is aware of the potential presence of species in the Project Area which may be harvested by Indigenous peoples outside the Project Area, including Atlantic salmon, American eel, swordfish, and tuna. Seabirds and their eggs, and seals that could occur in the Project Area may also be harvested by Indigenous peoples for FSC purposes.

6.0 SUMMARY AND CONCLUSION

BHP is proposing to conduct an exploration drilling program on ELs 1157 and 1158 in the Orphan Basin region of offshore Newfoundland and Labrador with an initial well planned as early as 2021. To characterize benthic conditions and support planning and mitigation of the drilling program, BHP is planning a visual survey of the seabed using an ROV or AUV at potential drilling locations within ELs 1157 and/or 1158. The initial seabed survey is planned to be conducted within ELs 1157 and/or 1158 between May and October 2020 pending authorization from the C-NLOPB, however seabed surveys could be conducted between 2020 and 2025 at any time of the year. Anticipated survey duration will be approximately 7 to 10 days, but could last as long as 30 days.

The survey will require an authorization from the C-NLOPB under the Accord Acts. As such, this Project Description has been prepared to initiate an EA process in accordance with the Geophysical, Geological, Environmental and Geotechnical Program Guidelines (C-NLOPB 2019). The survey plan for each prospective well location will be designed based on the results of cuttings dispersion modeling and will incorporate standard and recognized mitigation measures to manage potential environmental effects.

Building on Indigenous and stakeholder engagement efforts associated with their proposed exploration drilling program in the Orphan Basin, BHP will continue to liaise with Indigenous groups and commercial fisheries stakeholders about the survey to address potential Project-related questions or concerns as they arise.

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