

Tilt Cove Exploration Drilling Program

Executive Summary, Combined
Table of Contents and List of
Abbreviations

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TILT COVE EXPLORATION DRILLING PROGRAM

Suncor Energy (Suncor) gratefully acknowledges the contribution of the various firms that participated in the completion of this Environmental Impact Statement (EIS).

The EIS and its supporting studies were prepared by an integrated team comprised of personnel from Stantec Consulting Ltd., in association with Wood, LGL Limited, RPS, JASCO Applied Sciences, and Environmental Research Consulting.

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Executive Summary

Suncor Energy Offshore Exploration Partnership (Suncor) is proposing to undertake exploration drilling activities within its existing offshore Exploration Licence (EL) 1161 in the Jeanne d'Arc Basin, directly adjacent to its Terra Nova Production Licence, approximately 300 kilometres (km) east of St. John's, Newfoundland (NL). The Tilt Cove Exploration Drilling Project (herein referred to as "the Project") may involve drilling 12 to 16 exploration and delineation / appraisal wells over the term of the EL (2019 to 2028) of varying lengths. The temporal scope of the EIS itself extends to the end 2029, to allow for ongoing operations to continue or if the operator is diligently pursuing a well past the nine-year term or conducting any other activities covered in the EIS. An initial well is proposed to be drilled as early Q2 2024, or any time during the Project period following regulatory approval.

The exploration rights to EL 1161 were awarded to Suncor and its original co-venturers Equinor Canada Ltd. and Husky Oil Operations Limited by the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in 2019 (in January 2023 Suncor assumed 100% ownership). The term of this EL extends from January 15, 2019, to January 15, 2028. Suncor will serve as the primary operator for this exploration drilling program but may leverage a rig of opportunity for certain wells within the EL that could be operated by another operator on behalf of Suncor.

The Canadian Environmental Assessment Agency (now the Impact Assessment Agency of Canada [IAAC]) determined that the drilling of a well on EL 1161 constituted a "designated project" under section 10 of the *Regulations Designating Physical Activities* and therefore requires review and approval according to the requirements of the Canadian Environmental Assessment Act, 2012 (CEAA 2012). Following submission of the Project Description document, the Agency determined that an environmental assessment was required and subsequently Environmental Impact Statement (EIS) guidelines (Appendix A) were issued on June 28, 2019 to Suncor. The environmental assessment has been undertaken pursuant to CEAA 2012. New federal environmental assessment legislation (Bill C-69) received Royal Assent on June 21, 2019. However, Suncor submitted and received an extension from IAAC to continue the assessment of the currently proposed Project under CEAA 2012. Compliance with the EIS Guidelines (Appendix A) is demonstrated with a concordance table (Appendix B), which indicates where requirements have been addressed in this EIS document.

The EIS focuses on the identification and assessment of potential adverse environmental effects of the Project on valued components (VCs). VCs are environmental attributes associated with the Project that are of interest or concern to regulatory agencies, Indigenous peoples, Suncor, resource managers, scientists, key stakeholders, and/or the general public. Similar to other exploration drilling projects that have recently gone through the CEAA 2012 process, the following VCs were selected:

- Atmospheric Environment
- Marine Fish and Fish Habitat (including Species at Risk)
- Marine and Migratory Birds (including Species at Risk)
- Marine Mammals and Sea Turtles (including Species at Risk)
- Special Areas
- Indigenous Peoples
- Commercial Fisheries and Other Ocean Users



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The potential environmental effects from both routine activities and accidental events (excluding Atmospheric Environment) on each VC were assessed, as were cumulative effects arising in combination with effects from other past, present, or likely future projects and activities. Supporting studies conducted to inform the environmental effects assessment include drill cuttings dispersion modelling (Appendix C); an underwater sound assessment (Appendix D); and oil spill fate and trajectory modelling (Appendix E).

Similar to other offshore exploration drilling projects, routine Project activities with potential environmental interactions include:

- Mobile offshore drilling unit (MODU) mobilization and drilling (including light and underwater sound emissions, air emissions, drill muds and cuttings and other discharges, and establishment of a safety zone)
- Geophysical (including vertical seismic profiling [underwater sound emissions]), geological, geotechnical and environmental surveys
- Well evaluation and testing
- Well decommissioning, suspension and abandonment.
- Supply and servicing (including Project support vessel and helicopter operations)

With the implementation of proposed mitigation measures, adverse residual environmental effects (i.e., after planned mitigation is applied) from planned routine activities associated with the Project are predicted to be not significant (reversible, of short to medium duration, low to moderate magnitude, and localized geographic extent). Results from environmental effects monitoring conducted at adjacent licences were used to inform the assessment of routine effects. Environmental effects monitoring at the adjacent Terra Nova development field (Suncor 2019) have shown results are consistent with predictions made in the original EIS (Suncor 1996). Results from the first ten years of EEM at the adjacent Terra Nova field, indicate that biological effects from ten years of development drilling are limited and highly localized where they did occur (Neff et al. 2014). Most potential adverse Project effects will be addressed by standard mitigation measures, engineering design, and best management practices. VC-specific mitigation measures are identified where warranted. Most environmental effects are predicted to be reversible and of limited duration, magnitude, and geographic extent.

The assessment of environmental effects associated with potential (though unlikely) accidental events focus on credible worst-case accidental event scenarios. These include spills that could occur during MODU (synthetic-based mud spill) or support vessel (marine diesel spill) operations, and a subsea well blowout incident (crude oil spill). Should a large-scale accidental event occur (i.e., subsea well blowout), significant adverse environmental effects have been predicted for marine and migratory birds, special areas identified for marine and migratory birds, and Indigenous peoples, and commercial fisheries. However, the likelihood of a large-scale accidental event occurring is considered very low. While oil spill modelling is based on an unmitigated spill (i.e., no response, containment or clean-up), Suncor plans every well drilling program with a focus on safety and prevention, and will have an approved Project-specific Oil Spill Response Plan in place prior to spudding the well.

In summary, the Project is not likely to result in significant adverse residual environmental effects, including cumulative environmental effects, provided that the proposed mitigation measures are implemented



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Abbreviations

°C	degree Celsius
%	percent
δ13C	Isotopic signature of the ratio of Carbon-13 / Carbon-12
\$CAD	Canadian dollar
1SW	one sea-winter
2D	Two-dimensional
3D	Three-dimensional
4D	Four-dimensional (three-dimensional plus time)
µg	microgram
µg/L	microgram per litre
µg/m ³	microgram per cubic metre
µL	microlitre
µm	micrometre
µPa	micropascal
Accord Acts	<i>Canada-Newfoundland and Labrador Atlantic Accord Implementation Act and Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act</i>
ACSS	Atlantic Canada Shorebird Survey
ADW	Approval to Drill a Well
AGC	Atlantic Groundfish Council
AICFI	Atlantic Integrated Commercial Fisheries Initiative
ALARP	as low as reasonably practicable
ANSMC	Assembly of Nova Scotia Mi'kmaq Chiefs
API	American Petroleum Institute
ASM	American Society for Microbiology
ASP	Association of Seafood Producers
bbf	barrel
BdN	Bay du Nord
BHP	BHP Petroleum (New Ventures) Corporation
BIO	Bedford Institute of Oceanography
BOEM	Bureau of Ocean Energy Management
BOP	blowout preventer
BP	BP Canada Energy Group ULC
CAAQS	Canadian Ambient Air Quality Standards
CAC	Criteria Air Contaminant
CALPUFF	California Puff modeling system
CAPP	Canadian Association of Prawn Producers / Canadian Association of Petroleum Producers
CBD	[United Nations] Convention on Biological Diversity
CCG	Canadian Coast Guard
CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
CEA Agency	Canadian Environmental Assessment Agency
CECOM	Canadian East Coast Ocean Model



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CEPA	<i>Canadian Environmental Protection Act</i>
CH ₄	methane
Chevron	Chevron Canada
CI	Confidence Interval
CIS	Canadian Ice Service
cm	centimetre
CMA	Crab Management Area
CMIP	Coordinated Modelling Intercomparison Project
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
CNWA	<i>Canadian Navigable Waters Act</i>
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2eq}	carbon dioxide equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	catch per unit effort
CRHSS	Conne River Health and Social Services
CSAS	Canadian Science Advisory Secretariat
CV	coefficient variable
CWS	Canadian Wildlife Service
dB	decibel
dB re 1 μPa	decibel reference value 1 micropascal
DCC	Defence Construction Canada
DFO	Fisheries and Oceans Canada
DHC	Dissolved hydrocarbon
DND	Department of National Defence
DP	dynamic positioning
DST	drill stem test
DU	Designatable Unit
DWH	Deepwater Horizon
EA	environmental assessment
EBSA	Ecologically and Biologically Significant Area
ECCC	Environment and Climate Change Canada
ECRC	East Coast Response Corporation
ECSAS	Eastern Canadian Seabirds at Sea
EDC	excavated drill centre
EEM	Environmental Effects Monitoring
EEZ	Economic Exclusion Zone
EHS	Environment, Health & Safety
EIS	Environmental Impact Statement
EL	Exploration Licence
EMCP	ExxonMobil Canada Properties
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESG	Environment, Social and Governance
ESRF	Environmental Studies Research Fund
FAO	Food and Agriculture Organization of the United Nations



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FFAW-Unifor	Fish, Food and Allied Workers-Unifor
FNI	Federation of Newfoundland Indians
FPSO	floating production, storage and offloading [facility]
FSC	food, social and ceremonial
FTWT	Flow Testing While Tripping
FY	first-year [ice]
g	gram
g/kg	gram per kilogram
g/L	gram per litre
g/m ²	gram per square metre
g/s	gram per second
GBS	gravity-based structure
GCM	General Climate Model
GDP	Gross Domestic Product
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GJ	gigajoule
GLC	ground-level contaminant
GLODAP	Global Ocean Data Analysis Project
GPS	Global Positioning System
GWP	Global Warming Potential
ha	hectare
HC	hydrocarbon
HMDC	Hibernia Management and Development Company Ltd.
hp	horsepower
HQ	Hazard Quotient
Hs	Significant Wave Height
HYCOM	HYbrid Coordinate Ocean Model
Hz	Hertz
IAA	<i>Impact Assessment Act</i>
IAAC	Impact Assessment Agency of Canada
IBA	Important Bird Area
iBoF	Inner Bay of Fundy [Atlantic salmon Designatable Unit]
ICOADS	International Comprehensive Ocean-Atmospheric Data Set
ICS	Incident Command System
IIP	International Ice Patrol
IMO	International Maritime Organization
IOGP	International Association of Oil and Gas Producers
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
ISO	International Standards Organization
IUCN	International Union for Conservation of Nature
IWC	International Whaling Committee
K1	Diurnal, luni-solar diurnal, tide-producing force constituent
kg	kilogram
km	kilometre
km ²	square kilometre



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km ³	cubic kilometre
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
kt	kilotonne
L	litre
LAA	Local Assessment Area
LFA	Lobster Fishing Area
LILCA	<i>Labrador Inuit Land Claims Agreement</i>
LISA	Labrador Inuit Settlement Area
LMG	Listuguj Mi'gmaq Government
m	metre
M2	Semi-diurnal, principal lunar, tide-producing force constituent
m ²	square metre
m ³	cubic metre
m ³ / m ³	cubic metre per cubic metre
m ³ /day	cubic metre per day
MAMKA	Mi'kmaq Alsumk Moiwimsikik Koqoey Association
MANICE	Manual of Ice
MARPOL	Maritime Pollution under the International Convention for the Prevention of Pollution from Ships
MBCA	<i>Migratory Birds Convention Act, 1994</i>
MCPEI	Mi'kmaq Confederacy of Prince Edward Island
MCTS	Marine Communications and Traffic Services
MDT	Modular Dynamic Testing
MEAA	NL Basin Mutual Emergency Assistance Agreement
MFN	Miawpukek First Nation
mg/kg	milligram per kilogram
mg/L	milligram per litre
mg/m ³	milligram per cubic metre
MICT	Regroupement Mamit Innuat Tribal Council
ml	millilitre
ml/kg	millilitre per kilogram
mm	millimetre
MMAFMA	Mi'gmaq Maliseet Aboriginal Fisheries Management Association
MMO	marine mammal observer
MMS	Mi'gmawei Mawiomi Secretariat
MODIS	Moderate Resolution Imaging Spectroradiometer
MODU	mobile offshore drilling unit
MOG	Micmacs of Gesgapegiag
MPA	Marine Protected Area
MRI	Marshall Response Initiative
MSC50	Meteorological Service of Canada, Wind and Wave Hindcast
MSW	Multi sea-winter
MTI	Mi'gmawe'l Tplu'tagann Inc.
N2	Semi-diurnal, larger lunar elliptic, tide-producing force constituent
N ₂ O	nitrous oxide
N/A	Not Applicable
NAAQO	National Ambient Air Quality Objectives



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NAFO	Northwest Atlantic Fisheries Organization
NAO	North Atlantic Oscillation
NASA	National Aeronautics and Space Administration
NAVWARN	Navigational Warning
NB	New Brunswick
NCC	NunatuKavut Community Council
NEB	National Energy Board
NEBA	net environmental benefit analysis
NGC	Nunatsiavut Group of Companies
NHC	National Hurricane Center
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador <i>Endangered Species Act</i>
NLFFA	Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture
NM	nautical mile
NMCA	National Marine Conservation Area
NMFS	[United States] National Marine Fisheries Service
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NOTMAR	Notice to Mariners
NPRI	National Pollutant Release Inventory
NRA	NAFO Regulatory Area
NRC	National Research Council
NRCan	Natural Resources Canada
NRDA	Deepwater Horizon Natural Resource Damage Assessment Trustees
NS	Nova Scotia
NS OAA	Nova Scotia Office of Aboriginal Affairs
NTU	Nephelometric Turbidity Unit
O ₃	ozone
O1	Diurnal, principal lunar diurnal, tide-producing force constituent
OA	Operations Authorization
OBIS	Ocean Biogeographic Information System
OCI	Ocean Choice International
OCNS	Offshore Chemical Notification Scheme
OCSG	Offshore Chemical Selection Guidelines for Drilling and Production Activities on Frontier Lands
ODI	Ocean Data Inventory
OEMS	Operational Excellence Management System
OPS	Operational Policy Statement
OSC	On-scene Commander
OSPAR	Oslo / Paris convention (for the Protection of the Marine Environment of the North-East Atlantic)
OSRL	Oil Spill Response Limited
OSRP	Oil Spill Response Plan
OWTG	Offshore Waste Treatment Guidelines
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl



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PE	Prince Edward Island
PERD	Program on Energy Research and Development
PIROP	programme intégré de recherches sur les oiseaux pélagiques
PL	Production Licence
PLONAR	Pose Little or No Risk
PM	particulate material
PM _{2.5}	particulate matter less than 2.5 microns
PM ₁₀	particulate matter less than 10 microns
The Project	Tilt Cove Exploration Drilling Project
psi	pounds per square inch
PSU or psu	Practical Salinity unit
PTS	permanent thresholds shift
QC	Quebec
QMFN	Qalipu Mi'kmaq First Nation
R _{95%}	range to the given sound level after 5% of the farthest points are excluded
R _{max}	maximum range to the given sound level over all azimuths
RAA	Regional Assessment Area
RCMP	Royal Canadian Mounted Police
RCP	Representative Concentration Pathway
RMA	Representative Marine Areas
rms	root-mean-square
ROV	remotely operated vehicle
ROV	remotely operated vehicle
RMT	Response Management Team
rmp	revolutions per minute
RV	Research Vessel
S ₂	Semi-diurnal, principal solar, tide-producing force constituent
SAR	species at risk
SARA	<i>Species at Risk Act</i>
SBA	Significant Benthic Area
SBM	synthetic-based [drilling] mud
SCAT	Shoreline Clean-up Assessment Technique
SDL	Significant Discovery Licence
SDS	Safety Data Sheet
SEA	Strategic Environmental Assessment
SEL	sound exposure level
SEL ₂₄	2 sound exposure level over a 24-hour period
SEL _{cum}	cumulative sound exposure level
SERPENT	Scientific and Environmental ROV Partnership using Existing Industrial Technology
SFA	Shrimp Fishing Area
SIMA	Spill Impact Mitigation Assessment
SO ₂	sulphur dioxide
SOCC	Species of Conservation Concern
SOCP	Statement of Canadian Practice (with Respect to the Mitigation of Seismic sound in the Marine Environment)
SO _x	sulphur oxides
SPL	sound pressure level



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SPL _{peak}	peak sound pressure level
SPL _{rms}	root-mean-square sound pressure level
SSB	Spawning Stock Biomass
SST	sea surface temperature
Suncor	Suncor Energy Offshore Exploration Partnership
t	tonne
TCH	total hydrocarbon
TLH	Trans Labrador Highway
TNASS	Trans North Atlantic Sightings Survey
TPM	total particulate matter
TTS	temporary thresholds shift
UINR	Unama'ki Institute of Natural Resources
UNESCO	United Nations Educational, Scientific and Cultural Organization
USDOI MMS	United States Department of the Interior Minerals Management Service
US EPA	United States Environmental Protection Agency
VC	Valued Component
VME	Vulnerable Marine Ecosystem
VOC	volatile organic compound
VON	Victoria Order of Nurses
VSP	vertical seismic profiling
WBM	water-based [drilling] mud
WMP	Waste Management Plan
WNNB	Wolastoqey Nation of New Brunswick
WOCE	World Ocean Circulation Experiment
WTCI	Wolastoqey Tribal Council Incorporated

