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Environmental Assessment Amendment



**Amendment to the Environmental Assessment of
StatoilHydro Canada Ltd. Exploration & Appraisal/Delineation
Drilling Program for Offshore Newfoundland, 2008-2016**

SH-CNO-0111-12

Title: Amendment to the Environmental Assessment of StatoilHydro Canada Ltd. Exploration & Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016
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1 Introduction

In 2008, Statoil received a Canadian Environmental Assessment Act approval ([CEAR No. 07-01-32083](#)) with conditions based on an environmental assessment entitled "*Environmental Assessment of StatoilHydro Canada Ltd. Exploration & Appraisal/Delineation Drilling Program for Offshore Newfoundland, 2008-2016*". Pursuant to that approval, annual updates documenting the consistency of ongoing operations with the original assessment were submitted to the C-NLOPB for review and acceptance.

While an environmental assessment update will be submitted for Statoil's exploration drilling program that will begin late in 2012, the C-NLOPB was advised that one of the proposed drilling locations, (Cupids A-33), is approximately four (4) kilometers outside the northern boundary of the environmental assessment *Project Area* but within the assessment *Study Area* (Figure 1). The proposed well location, identified through reviews of seismic survey information, is in approximately 2,835 metres of water in the northern Flemish Pass on the in the south-eastern edge of the Orphan Basin, approximately 140 kilometers outside Canada's Exclusive Economic Zone (EEZ).

The other exploration wells proposed for 2012 – 2013, i.e., Harpoon O-85 and Federation K-87 fall within the geographic scope of the environmental assessment and will be addressed as part of the normal environmental assessment update process for 2012 and 2013 depending on the timing of these drilling operations.

The purpose of this document is to consider the location of the proposed Cupids A-33 well and determine if there are any potential environmental effects not addressed in the existing environmental assessment and subsequent updates.

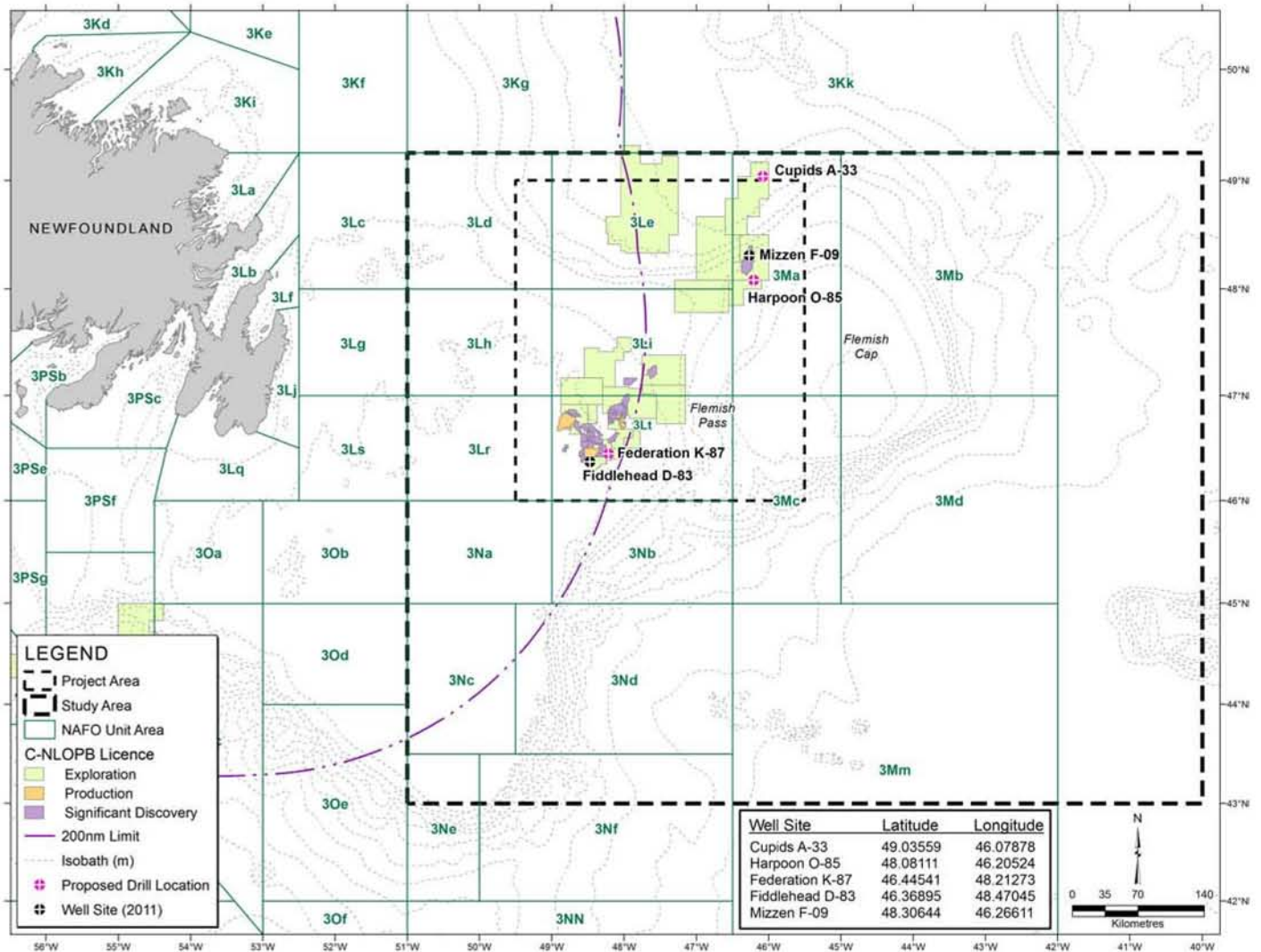
2 Scope of the Original Assessment

The geographical scope of the original assessment encompassed the *Study* and *Project Areas* depicted in Figure 1 and its temporal scope was from 2008 through 2016. This scoping was based on both Statoil's existing and anticipated exploration lease acquisitions at the time and the potential environmental effects of the drilling and geohazard operations envisaged, including the geographic extent of a significant oil spill.

The original assessment addressed the range of concerns and issues identified in the CEA [Scoping Document](#) issued by the C-NLOPB.

As noted previously, the proposed Cupids A-33 well is within the *Study Area* and temporal scope defined and accepted for the original assessment that took into account the activities, potential environmental effects and issues referred to above.

Figure 1: Relationship of Proposed Wells for 2012 & 2013 and Geographic Scope of Statoil Exploration & Delineation Environmental Assessment



The Valued Ecosystem Components (VECs) identified in the original assessment were Fish and Fish Habitats, Commercial Fisheries, Seabirds, Marine Mammals, Sea Turtles and Species at Risk.

3 Review of Environmental Aspects

Given Statoil's ongoing environmental assessment updates, which take into account the content of recent environmental assessments, it is reasonable to conclude that the VECs chosen for the original environmental assessment are still valid and hence valid for the Cupids A-33 location. Neither Statoil's updates nor recent

environmental assessments in the Jeanne d'Arc or the adjacent Orphan Basin area have brought to light new VECs since the approval of the original Statoil environmental assessment. Similarly, there is no reason or new information that, given location of the proposed Cupids A-33 well, the potential effects of the environment on the project have materially changed.

Since the proposed Cupids A-33 well location is included in the original environmental assessment *Study Area*, the baseline descriptions of the biological and physical environments remain valid and are expected to do so throughout the remaining temporal scope of the assessment.

Given the foregoing, and in no order of priority, the most important aspects to consider with respect to the location of Cupids A-33 well site are:

- Any implications for species at risk or special areas
- Interaction with commercial fishing interests
- A significant oil spill given its implications for all VECs

3.1 Special Areas & Species at Risk

3.2 Corals

Figure 2 depicts the distribution of NAFO Coral and Sponge Closure Areas overlaid on the pattern of commercial crab and shrimp fisheries in the environmental assessment's study and project areas and in relation to Statoil's drilled and proposed well sites.

The Cupids A-33 well location is not near the recently established fishing exclusion zones protecting corals in this area or any known coral aggregations. The shortest distance to NAFO Coral Closure Area 6 (Sackville Spur) is approximately fifty (50) kilometers (Figure 3). The mitigation measure specified in the original assessment that calls for a survey of the spud location for corals and a setback of 100 meters from the spud location to any such aggregation still applies.

Figure 2: Distribution of NAFO Coral and Sponge areas closed to bottom trawling in Study and Project Area

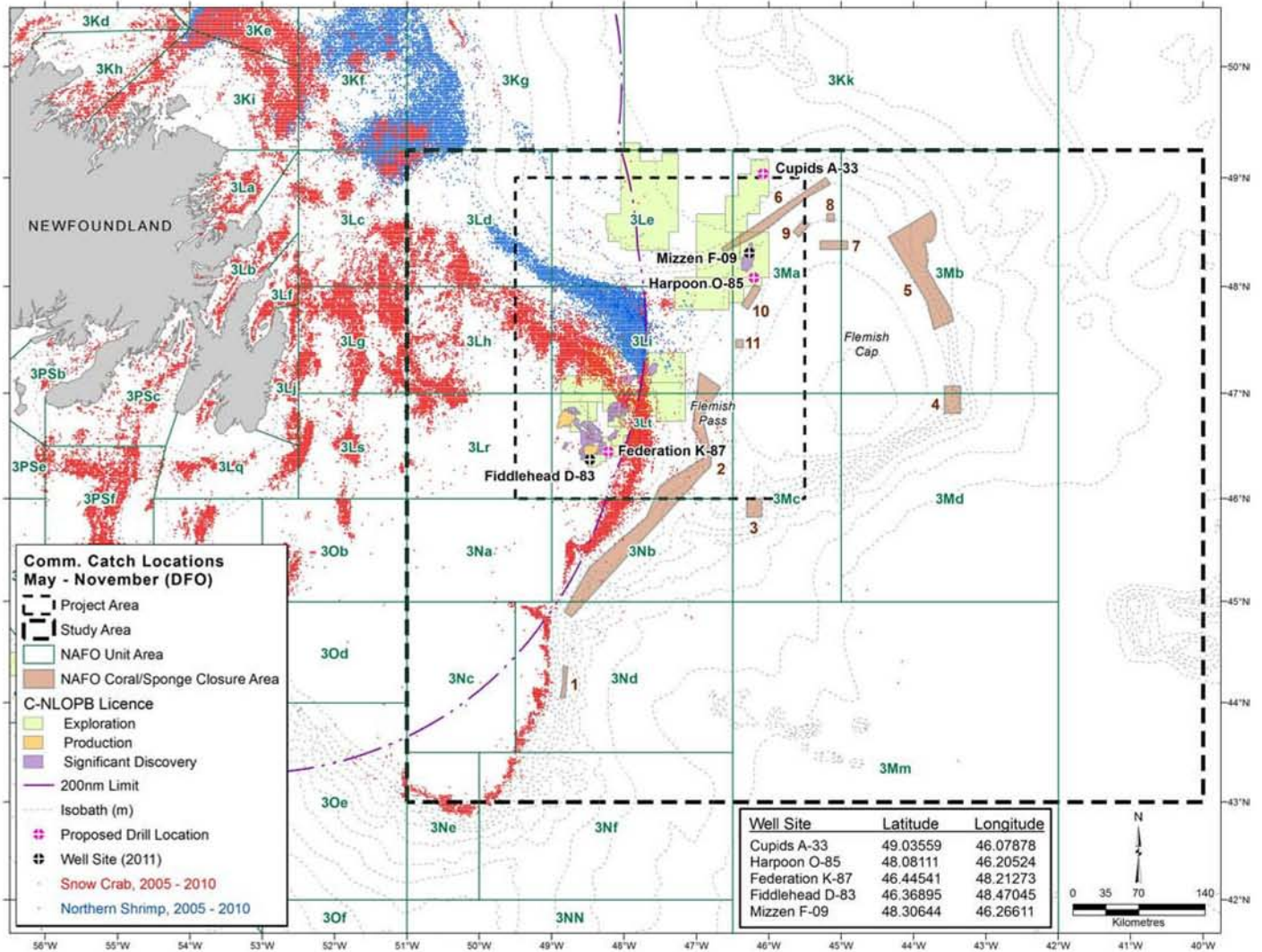
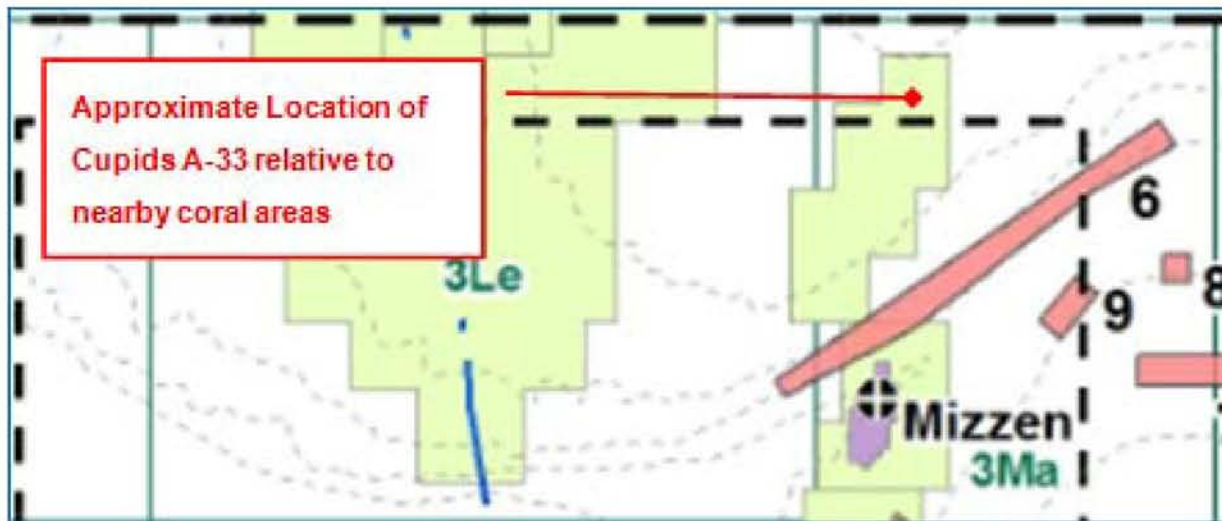


Figure 3: Relationship of Cupids A-33 to protected coral areas



3.3 Species at Risk

Statoil tracks changes in species at risk reviews and designations in its annual environmental assessment updates for its offshore exploration activities (seismic and drilling). The most recent assessment submitted was *Statoil Canada Ltd. - East Coast Operations Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2012 Seismic Survey Operations* (April 2012; Amended May 2012). The species at risk evaluation in that document, the geographic scope of which encompasses the Cupids A-33 area, identified that the White Shark (*Carcharodon carcharias*) was added to Species at Risk Act Schedule 1 listings since the original assessment and last environmental assessment update in 2011.

From a COSEWIC perspective one new species Kemp Ridley's sea turtle (*Lepidochelys kempii*) was added to the COSEWIC listings as noted in Appendix 1. In addition, the American Eel (*Anguilla rostrata*) has been upgraded in the COSEWIC listings from special concern to threatened. In all, eleven (11) species were added to the COSEWIC listings since the original, 2008, assessment. Appendix 1 provides a summary status of all SARA and COSEWIC species and their status relevant to this amendment.

None of the species added since 2008 have had critical habitat designations associated with them¹, hence, the conclusions reached in the original environmental assessment remain valid as updated in the environmental assessment updates submitted over the years. Appendix 2 of the C-NLOPB guidelines - *Geophysical, Geological,*

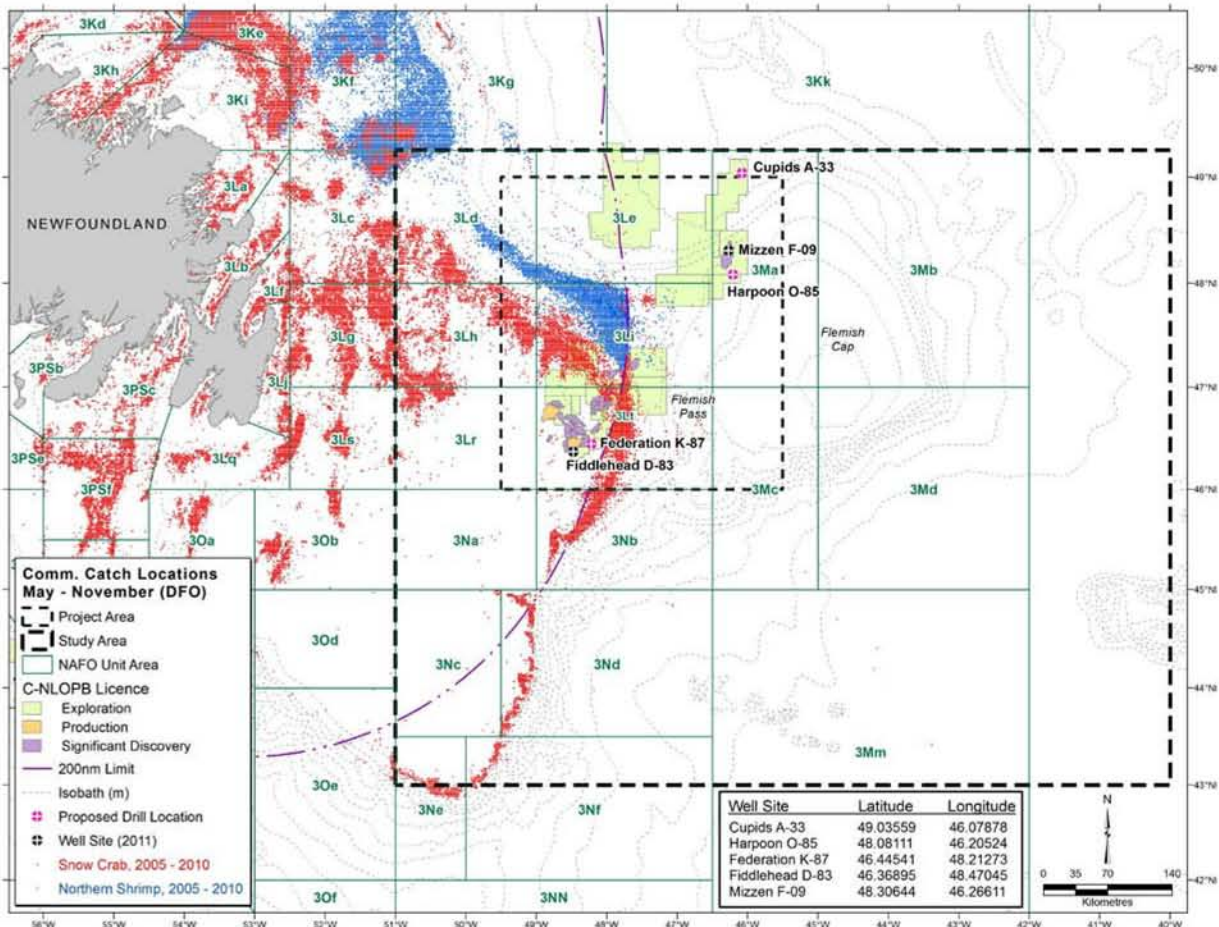
¹ As noted in Appendix 1 the Right Whale (*Eubalaena glacialis*) has critical habitat statement exists however, it is rare in the *Study Area* considered in this assessment with one sighting of two individuals recorded in the DFO cetacean database.

Environmental and Geotechnical Guidelines 2012 which addresses species at risk as well as marine mammals and sea turtles generally, apply to the conduct of any vertical seismic profile program carried out in support of the drilling operation at Cupids A-33.

3.4 Commercial Fishing

The Cupids A-33 location is distant (~130 km) from the well established snow crab and northern shrimp fishing areas as shown in Figure 3. The localized nature of the proposed drilling operation at the Cupids A-33 location does not pose any new potential effects to any other mobile or fixed gear fishery not considered in the original environmental assessment. Therefore there are no new, unassessed, potential impacts from normal drilling operations associated with

Figure 4: Distribution of Crab and Shrimp Fisheries Activity Relative to the Cupids A-33 Well Location



Cupids A-33. Operational coordination with fishing interests on well or activity specific issues of mutual interest is carried out on an ongoing basis and reported on as appropriate in the annual EA updates. The effects associated with

a potential oil spill are also not significantly different from those assessed in the original environmental assessment (see also Section: Oil Spill).

3.5 Oil Spill

For the original environmental assessment, Statoil commissioned an oil spill modelling study for potential spills emanating from the Mizzen F-09 well² (Figure 1) which is located approximately 86 kilometers almost due south of the proposed Cupids A-33 well. Appendix 2 provides a series of figures summarizing the results of that modelling exercise in terms of the geographic extent of the trajectories of an oil spill. The hyperlink below provides an animation of the monthly patterns in Appendix 2.



Apart from the more northerly spill source location the changes with respect to modelling *input* parameters between the time of the original assessment and now can be summarized as follows:

- Additional data has been added to the MSC50 data base that provides wind and wave inputs
- Additional data has been added to the water current data held by Fisheries and Oceans Canada

Although more data on wind, waves and currents will be available, review of more recent environmental assessment updates for the Orphan Basin area (Oceans, 2012) does not indicate that the nature of these data has changed so significantly from the original environmental assessment that the dispersion of oil from a spill is expected to be radically different.

Obviously, the estimated volumes from an oil spill (either over time or as a batch) will affect modelling predictions of the overall area affected by a spill. In the 2008 study, the blowout volume modelled was based on 5,000 cubic meters per day (plus 80 cubic meters of gas per cubic meter of oil) from a depth of about 1,100 meters. Two batch spill scenarios of 10 and 100 barrels were modelled as credible losses of marine diesel fuel from a supply vessel. These input parameters were and are reasonable representations of a blow out and batch spills associated with this kind of drilling program. Statoil's recent review of blowout risk in the context of the Cupids A-33 well demonstrates an expected rate of oil release during a surface blowout of 2,409 standard cubic meters per day. For a seabed release the rate is 1677 standard cubic meters per day. The corresponding blowout rates for gas are 0.11 and 0,08 standard cubic meters per day respectively. These figures are well within the scope of the modelling done for the original environmental assessment.

² *The Fate and Behavior of Hypothetical Oil Spills from the StatoilHydro 2008 Mizzen Drilling Program*. S.L. Ross Environmental Research Ltd. January 2008

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A similar oil spill modelling study was carried out for an Orphan Basin exploration drilling program by Chevron Canada Limited and described in its Orphan Basin Exploration Drilling Program Environmental Assessment (LGL, 2005). Chevron's spill modelling resulted in a very similar, localized pattern of oil dispersal, to that determined for the Statoil modelling for Mizzen provided in Appendix 2. Chevron modelled oil spills for two locations of interest to their program defined as Basin and Shelf Slope. Both provided results similar to that in Animation 1. Figure 4 shows the relative locations of Chevron's model spill sources and the Mizzen model spill source relative to the Cupids A-33 location. The Cupids A-33 location is approximately 135 kilometers east and 155 kilometer north-east of the Chevron Basin and Shelf Source modelling locations respectively and about 86 kilometers north of Statoil's Mizzen modelling source.

The Cupids A-33 well is located in approximately 2,835 meters of water and is a further 86 kilometers away from the Flemish Pass and key shrimp and crab fishing areas; relative to the Mizzen location. It is not likely that a spill from the Cupids A-33 location would behave substantially differently in terms of the general pattern of dispersion modelled for the Mizzen or the two Chevron well locations described above. A spill of the magnitude of those modelled would still result in the same environmental effects - including a significant effect on seabirds. Thus, the original assessment's conclusions for the VECs at risk, particularly seabirds, do not change for the well location described in this document.

Figure 5: Relative Locations of Spill Sources used for Oil Spill Modelling by Chevron (Basin and Slope Sources) and Statoil (Mizzen) relative to the proposed Cupids A-33 well



3.6 Cumulative Effects

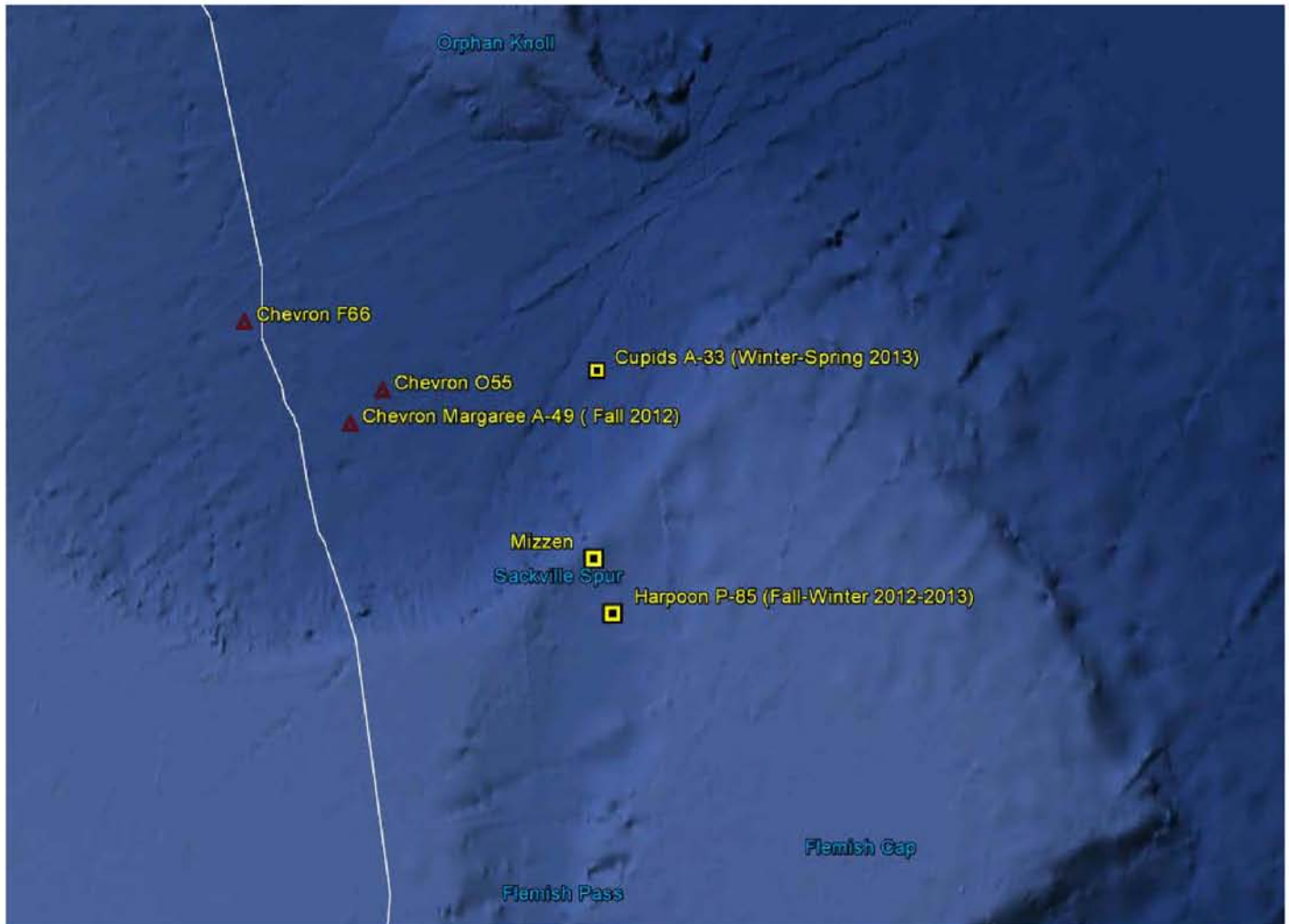
Potential cumulative effects of Statoil's proposed exploration and delineation drilling program on all the VEC's identified were addressed in the original assessment. Since the potential for exploration drilling operations other than Statoil's was known to the extent possible at that time, it is useful to reflect on the cuttings discharge aspect of drilling activity in the Orphan Basin and Flemish Pass area since the time of the original assessment. Cuttings are the largest discharge from an exploration drilling operation and as they deposit predominately on the seafloor in the immediate vicinity of the well site have the potential to affect fish habitat in that localized area. In addition, the cumulative effects overall for all VECs from the various activities associated with exploration drilling are driven by the number of wells drilled.

Figure 6 shows the locations of previously drilled and planned wells by both Chevron and Statoil in the general vicinity of the Cupids A-33 well location. Statoil envisaged up to 27 wells in its original assessment and recognized the potential for various other exploration wells by other operators on the Grand Banks. As shown in Figure 5 to date three (3) exploration wells have been drilled in the vicinity of Cupids A-33 (two by Chevron and one by Statoil) and three more are in the finally planning stages for 2012 and 2013 (two by Statoil and one by Chevron).

Consistent with other assessments the original Statoil assessment predicted that, per well, a maximum of 0.8 km² of seabed would be covered to a thickness of 1 centimetre. The three wells drilled to date in the vicinity of Cupids A-33, two of which are outside the Statoil assessment project area, would therefore have affected approximately 2.4 km² of seabed and hence any potential fish habitat in the immediate vicinity of these well locations. The next three wells all of which will be encompassed by the Statoil project area, although one of these will be drilled by another operator, will potentially have a similar affect with a maximum of 4.8 km² being affected by all six wells drilled in the Orphan Basin/Flemish pass area in recent years.

If we add the three wells actually drilled in the vicinity of Cupids in recent years to the total well count estimated in the environmental assessment for the entire Project Area, which includes exploration wells proposed by other operators, then the seabed area potentially affected within the Project Area is forty eight times 0.8 km² or 38.4 km² or 0.034% of the total Project Area. This figure is marginally above, but fully consistent with, the estimate arrived at in the original assessment. On this basis, there is no reason to conclude that the cumulative effects of exploration drilling have changed.

Figure 6: Locations of previously drilled and planned exploration wells by operators in the vicinity of the Cupids A-33 well. Expected timeframes for planned wells are noted.



4 Conclusion

The location of the Cupids A-33 exploration well location is approximately four (4) kilometers north of the *Project Area* boundary defined for Statoil's 2008 environmental assessment of its exploration and delineation drilling plans for 2008 through 2016.

This proposed departure from the scope of the original environmental assessment was reviewed to determine if:

- any of the conclusions reached with regard to the potential environmental effects and/or their significance would be affected by this change in geographic scope; and,

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- there were any new environmental effects attendant on this change that require assessment or establishment of a new VEC

The VECs identified in the original assessment were Fish and Fish Habitats, Commercial Fisheries, Seabirds, Marine Mammals Sea Turtles and Species at Risk are still valid and there is no new information that would indicate a new VEC needs to be considered.

With the application of the mitigation measures committed to in the original assessment drilling of the Cupids A-33 well does not engender any new or un-assessed effects on the VECs originally assessed. Similarly, there are no new or unique potential effects arising from the proposed drilling operation that require re-assessment. Finally, the expected cumulative effects of the proposed drilling activities discussed in this amendment are still consistent with those identified in the original environmental assessment.

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7. [Statoil Canada Ltd. - East Coast Operations Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2010](#)

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8. Statoil Canada Ltd., 2012, Amendment to the Environmental Assessment of Statoil's Geophysical Program for the Jeanne d'Arc and Central Ridge/Flemish Pass Basins, 2011-2019 – *Under Review*
 9. Statoil Canada Ltd. - East Coast Operations Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2012 - Seismic Survey Operations (April 2012; Revised May 2012)

Appendices

Appendix 1 - Current Listing of SARA and COSEWIC Listed Species in the Statoil *Project Area(s)*

Appendix 2 - Monthly Spill Dispersion Pattern from Modelled Oil Spill at Mizzen Well Site

Appendix 1: Current Listing³ of SARA and COSEWIC Listed Species in the Statoil Project Area(s)⁴

Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
			Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁵
Common Name	Scientific Name								
Birds									
Ivory Gull	<i>Pagophila eburnea</i>		1			X			
Marine Fish									
Northern wolffish	<i>Anarhichas denticulatus</i>			1			X		
Spotted wolffish	<i>Anarhichas minor</i>			1			X		
Atlantic wolffish	<i>Anarhichas lupus</i>				1			X	
Atlantic cod	<i>Gadus morhua</i>				3				
Atlantic cod (Newfoundland & Labrador population)	<i>Gadus morhua</i>					X			
Atlantic Salmon (various regional populations)	<i>Salmo salar</i>					X	X	X	
Porbeagle shark	<i>Lamna nasus</i>					X			
White shark	<i>Carcharodon carcharias</i>	■	1 ⁶			X			
Roundnose Grenadier	<i>Coryphaenoides rupestris</i>					X			
Cusk	<i>Brosme brosme</i>						X		
American Shad	<i>Alosa sapidissima</i>						X		

³ May 2012

⁴ Green Shade means a final Recovery Strategy is in place but no Critical Habitat has been identified nor have Action or Management plans been finalized for these species with the exception of the North Atlantic Right Whale (see footnote 8). Note that two other species that have recovery strategies, the Atlantic Walrus and Grey Whale, have been extirpated from Eastern Canadian waters and therefore are not listed in the above table.

⁵ Candidate COSEWIC species are classified as High (H), Medium (M) or Low (L) Priority Candidate (PC) species

⁶ June 2011

Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
			Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁵
Common Name	Scientific Name								
Alewife	<i>Alosa pseudoharengus</i>								MPC
Capelin	<i>Mallotus villosus</i>								MPC
Haddock	<i>Melanogrammus aeglefinus</i>								MPC
Shortfin mako shark	<i>Isurus oxyrinchus</i>						X		
Blue shark	<i>Prionace glauca</i>							X	
American Eel	<i>Anguilla rostrata</i>							X	
Roughhead grenadier	<i>Macrourus bergla</i>							X	
Bluefin Tuna	<i>Thunnus thynnus</i>					X			
Spiny eel	<i>Notacanthus chemnitzii</i>								MPC
Pollock	<i>Pollachius virens</i>								MPC
Spinytail Skate	<i>Bathyraja spinicauda</i>								MPC
Ocean pout	<i>Zoarces americanus</i>								MPC
American Plaice (Newfoundland & Labrador Population)	<i>Hippoglossoides platessoides</i>							X	
Acadian Redfish (Atlantic Population)	<i>Sebastes fasciatus</i>							X	
Deepwater Redfish (Northern Population)	<i>Sebastes mentella</i>							X	
Spiny Dogfish	<i>Squalus acanthias</i>								X
Basking Shark	<i>Cetorhinus maximus</i>								X
Marine Mammals									
Blue whale	<i>Balaenoptera musculus</i>		1			X			

Species		New since last update	SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
			Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ⁵
Common Name	Scientific Name								
Humpbacked whale	<i>Megaptera movaeanglia</i>				3				
North Atlantic right whale ⁷	<i>Eubalaena glacialis</i>		1			X			
Fin whale (Atlantic population)	<i>Balaenoptera physalus</i>				1			X	
Killer Whale (NW Atlantic & Eastern Arctic Populations)	<i>Orcinus orca</i>							X	
Sperm whale	<i>Physeter macrocephalus</i>								LPC
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>								MPC
Sowerby's beaked whale	<i>Mesoplodon bidens</i>				3			X	
Northern Bottlenose whale (Davis Strait/Baffin Bay/Labrador Sea)	<i>Hyperoodon ampullatus</i>							X	
Harbour porpoise	<i>Phocoena phocoena</i>			2				X	
Hooded seal	<i>Cystophora cristata</i>								LPC
Harp seal	<i>Phoca groenlandica</i>								LPC
Ringed seal	<i>Pusa hispida</i>								HPC
Reptiles									
Leatherback sea turtle	<i>Dermochelys coriacea</i>		1			X			
Loggerhead sea turtle	<i>Caretta caretta</i>					X			
Kemp Ridley's sea turtle	<i>Lepidochelys kempii</i>	■							LPC

⁷ A critical habitat statement exists for this species however; it is rare in the Study Area considered in this assessment with one sighting of two individuals recorded in the DFO cetacean database.

Appendix 2: Monthly Spill Dispersion Pattern from Modelled Oil Spill at Mizzen Well Site

