6.0 SUMMARY AND CONCLUSIONS

This SEA has been completed in relation to potential offshore oil and gas exploration in the SEA Area, including potential seismic surveys (2-D, 3-D, geohazard and VSP) and exploration and delineation drilling programs. The C-NLOPB will use the information presented in this SEA in decision-making for offshore exploration activities for the SEA Area. The SEA provides an overview of the existing environment of the SEA Area, discusses in broad terms the potential environmental effects which may be associated with offshore oil and gas exploration in the SEA Area, identifies knowledge and data gaps, highlights any key issues of concern and makes recommendations for mitigation and planning. Information from the SEA will assist the C-NLOPB in determining whether exploration rights should be offered in whole or in part for the SEA Area and may also identify general restrictive or mitigative measures that may be considered for application to seismic and/or drilling activities.

6.1 Potential Issues

There are a variety of potential issues that are generally applicable to offshore oil and gas exploration, including:

- effects of sounds associated with industrial activities, including seismic surveys, on marine mammals, sea turtles, seabirds, invertebrates, fish and species at risk;
- attraction of seabirds, particularly petrels, to drill rigs and survey and supply vessels;
- disturbances to benthic communities;
- smothering of benthic communities due to drill cuttings deposition;
- collision between surveys and support vessels and marine mammals (including species at risk);
- disturbance to sensitive areas such as migration routes, spawning areas and nurseries;
- the use of explosives to close well heads at the end of a drilling program (if conventional mechanical means fail);
- potential cumulative environmental effects from offshore oil and gas exploration activities and effects from other users in the same vicinity (e.g., commercial fishing, vessel traffic, tourism and recreation-related activities such as whale watching); and
- effects of accidental events on birds, marine mammals, sea turtles, invertebrates, fish and related habitat, commercial fisheries and species at risk.

Several potential issues specific to the SEA Area were identified and include:

- potential sensitivity of eelgrass beds, saltmarshes, shallow subtidal and intertidal areas to accidental events as they are host to a variety of migratory birds;
- potential sensitivity of suspension and filter feeding benthic invertebrates, in particular bryozoans and soft and hard corals, to drilling discharges;
- potential sensitivity of key fish spawning and nursery areas with in the SEA Area, in particular the St. Pierre Bank, Burgeo Bank and the Laurentian Channel;

- potential sensitivity of key Atlantic cod spawning (off Port au Port Peninsula outside the SEA Area) and overwintering areas within the SEA Area as a result of the mixing of the Northern Gulf and 3Ps stocks, in particular on the Burgeo Bank;
- potential sensitivity of key redfish spawning and mixing areas within the SEA Area as a result of mixing of Unit 1 and Unit 2 redfish;
- the presence of all three redfish species within SEA Area as well as the occurrence of introgressive hybrid individuals;
- presence of all three species of wolffish, in particular the northern and spotted wolffish, which are protected under SARA, through out the SEA Area;
- potential use of locations within the SEA Area by porbeagle shark as a mating ground, particularly the St. Pierre Bank and Laurentian Channel;
- important habitat within the SEA Area used by birds for breeding, nesting and overwintering, which includes the Harlequin Duck (listed as Species of Concern under SARA) and the Piping Plover (Endangered under Schedule 1 of SARA); and
- the presence of two IBAs within the SEA Area (Big Barasway and Grand Bay West to Cheeseman Provincial Park).

6.2 Data Gaps

The availability of information varies considerably among the various components of the SEA Area. Detailed information is available regarding commercial fishing activity in the region; there are key data gaps with respect to underexploited or non-commercial invertebrate and fish species within the SEA Area. Although the available information does allow for a general understanding of the environment of the SEA Area, there may be a need for additional information to allow seismic surveys and drilling programs to be planned and implemented such that environmental effects are avoided or reduced. For those environmental components for which there is limited existing information, special care will have to be exercised in the review of seismic surveys or exploratory drilling programs proposed, with time, site and/or activity-specific mitigation measures implemented as required.

Key data gaps identified for the SEA Area include:

- the database of current measurements for the region is poor;
- the database on which Colbourne and Murphy (2005) based their analysis was sparse; any project-specific environmental assessment should make some comment about this and indicate that the actual circulation at any given time could differ measurably;
- benthic species distribution, abundance and diversity;
- many scientific assessments for commercial species are dated; therefore, it is difficult to accurately describe and assess the population size and structure for several species, including Iceland scallop, snow crab, Atlantic salmon and pelagic fishes;
- the distribution of fish and shellfish eggs and larvae within the SEA Area is not well documented and understood, including spatial and temporal variability;
- location of spawning areas and other critical habitat for invertebrates and fish species is limited;
- detailed information on locations of enhanced productivity for fish species, including areas of concentrations of feeding seabirds and marine mammals (e.g., St. Pierre and Burgeo Banks), is limited and vague;

- efforts to verify fisher traditional knowledge are still required;
- overall lack of data with respect to noise and vessel interactions for marine mammals and sea turtles in general;
- the spatial and temporal distribution and related biology of SARA-listed species including wolffish, leatherback sea turtles and various whale species is limited;
- oil spill trajectory modelling for bid parcels within the SEA Area are nonexistent; and
- underwater noise data in the SEA Area have not been modelled or measured.

Since the database of current measurements for the region is poor, it would be appropriate, as per the *Guidelines Respecting Physical Environmental Programs during Petroleum Drilling and Production Activities on Frontier Lands* (NEB et al. 1994) that some form of near real-time current profiling capability is present to assist in a range or normal operating or possible emergency monitoring situations. This would also provide valuable additional data for possible future offshore exploration (to name one discipline) modelling or design study applications.

6.3 Addressing Data Gaps

Some of the data gaps noted above can be addressed by government departments under their respective mandates, through collaborative efforts between industry and government, as part of site-specific environmental assessments and through site-specific monitoring programs associated with oil and gas activities. Some activities that could assist in addressing identified data gaps are described in the following.

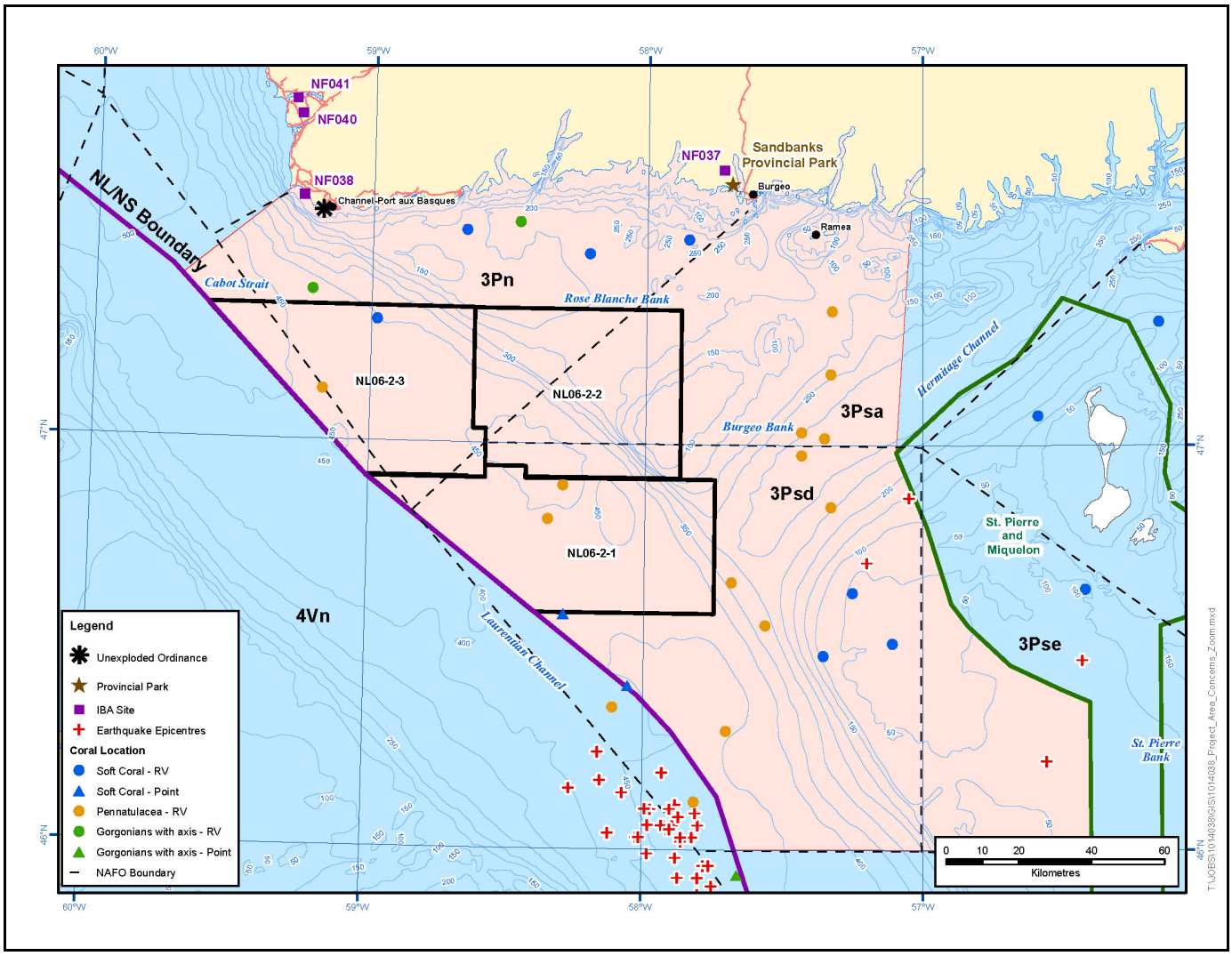
- The collection of spatial and temporal data on fish spawning, distribution of fish and shellfish eggs and larvae would be valuable for use in environmental effects assessments, as well as fisheries management. The collection of data and information with respect to SARA-listed species, including wolffish, leatherback sea turtles and various whale species, would be beneficial for fisheries and resource management.
- Verification of fisher traditional knowledge would enhance existing scientific knowledge.
- Requirements for original site-specific data as part of the environmental assessment process may be required for certain components such as benthic invertebrates, seabirds and marine mammals, which could be collected opportunistically during seismic and drilling programs.
- Monitoring and observation programs undertaken during exploration drilling and production activities.
- Research through collaborative partnerships such as the Environmental Studies Research Fund, Petroleum Research Atlantic Canada and Program of Energy Research and Development on noise, sound modelling and vessel interactions would add to the existing scientific knowledge.
- The requirement for site-specific oil spill and cuttings deposition modelling as part of the environmental assessment process.

6.4 Planning Considerations

A number of key environmental planning and management considerations related to future offshore exploration in the SEA Area are summarized below. The potential sensitive areas within the SEA Area, including corals, sensitive bird areas, seismic epicentres and sensitive fish and fish habitat, are identified in Figure 6.1.

- Several species at risk are known or likely to occur in or adjacent to the SEA Area. Mitigating potential effects to species and habitats protected by the SARA will be an important consideration in decisions related to future offshore exploration.
- A number of areas and times are particularly important to fish and fish habitat (including benthic invertebrates) in the region (e.g., spawning areas and periods, migration routes, areas of high productivity). Individual seismic programs should, where possible, be planned so as to reduce potential interactions during particularly sensitive times.
- Seismic surveys are, where possible, planned to coordinate program activities with the fishing industry to reduce potential conflict with commercial fishing activity during peak fishing times.
- Areas where unexploded ordinance are known to occur should be avoided.
- Cumulative effects will need to be included at the project-specific environmental assessment stage.
- The SEA Area lies adjacent to a region that is generally regarded as the most seismically active portion of the Newfoundland Continental Shelf. The earthquake potential of the area will therefore require consideration in planning any future offshore petroleum activity.
- The SEA Area has several unique shore types (saltmarshes, tidal flats, sandy beaches) hosting a variety of bird species, including the endangered Piping Plover. Spill prevention and response will be important issues for the SEA Area, not just for the unique shore types but also as a result of several locations of enhanced productivity (St. Pierre and Burgeo Banks).
- Particular geographic areas and all Species at Risk will require mitigation above and beyond those typically applied to exploration programs or required under regulations; these would be identified in a Project-specific environmental assessment (a useful publication is an aviation manual, “The Weather of Atlantic Canada and Eastern Quebec”, available online from Nav Canada (under Local Area Weather Manuals) [www.navcanada.ca/ContentDefinitionFiles/publications/lak/atlantic/A34E-W.pdf].

Figure 6.1 Potentially Sensitive Areas within the Strategic Environmental Assessment Area



6.5 Available Mitigations

There is the existence of several standard mitigation strategies that, when employed, would limit the potential for environmental effects from exploration activities. In addition to mitigations that would be identified in a project-specific environmental assessment, operators would be required to comply with all applicable legislation and guidelines:

- *Canada-Newfoundland Atlantic Accord Implementation Act* (S.C. 1987, c.3);
- *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* (R.S.N.L. 1990, c. C-2);
- *Newfoundland Offshore Petroleum Drilling Regulations*;
- *Newfoundland and Labrador Offshore Area Petroleum Geophysical Operations Regulations*;
- *Geophysical, Geological, Environmental and Geotechnical Program Guidelines, Newfoundland Offshore Area*, April 2004;
- *Newfoundland Offshore Petroleum Installations Regulation*;

- *Canada-Newfoundland Oil and Gas Spills and Debris Liability Regulations*;
- *Newfoundland Offshore Petroleum Drilling Regulation*;
- *Newfoundland Offshore Certificate of Fitness Regulation*;
- *Offshore Waste Treatment Guidelines, August 2002*;
- *Guidelines Respecting the Selection of Chemicals Intended to be Used in Conjunction with Offshore Drilling and Production Activities on Frontier Lands* (January 1999); and
- *Guidelines Respecting Drilling Programs in the Newfoundland Offshore Area*.

6.6 Conclusion

The Sydney Basin SEA Report concludes that petroleum exploration activity generally can proceed in the Sydney Basin area of the Newfoundland and Labrador Offshore Area with the application of standard mitigation measures currently applied to offshore exploratory activities elsewhere in the Newfoundland and Labrador offshore. However, the SEA Report identifies sensitive fish habitat and coral communities within the SEA Area. Implementation of the following non-standard mitigations or restrictions on activities likely will be required:

- The timing of seismic survey activities may be restricted to avoid peak spawning and migration times identified for redfish and Atlantic cod in the SEA Area, including Parcels 1, 2 and 3.
- In areas with known coral community abundances, activities involving the direct physical disturbance of the seabed may be restricted. Enhanced mitigation measures to reduce or eliminate effects on corals from the disposal of offshore wastes may be required. Corals have been identified in Parcels 1 and 3.
- In the nearshore area of the SEA Area, the possible location of a shipwreck, *HMCS Shawinigan*, has been identified by DND. The location, while unknown, may be located near 47°34”N 59°1l”W. Wellsite or geohazard surveys may be required prior to any authorization involving physical disturbance (e.g., seabed sampling, drilling programs) in this area.

A project-specific environmental assessment will determine the nature and extent of these restrictions or non-standard mitigations for each activity proposed in each area. If it is determined during an assessment process that baseline information is required in order to assess impact predictions, the operator may then be required to undertake data collection. It is likely that during the early exploration phase, such data collection can be conducted opportunistically as part of ongoing industry activity. In the event that petroleum resources with development potential are discovered, the C-NLOPB will consult with the appropriate operator, government agencies and interested parties in the public to determine the specifics of data collection effort that would be required to support a future development application.

With regard to the proposed NMCA, decisions regarding the conduct of exploration activity will depend on the area designated by Parks Canada. These decisions cannot be made until the area is designated by Parks Canada as a NMCA.