Chapter 10: Conclusions

This Environmental Impact Assessment assesses potential impacts of the Sakhalin II Oil and Gas Development on the western population of the gray whale, *Eschrichtius robustus*. The western gray whale is listed as a Category I (endangered) species in the Red Data Book of the Russian Federation, and the population was recently reclassified as Critically Endangered (extremely high risk of extinction) by the IUCN-World Conservation Union. The IUCN Red List criteria used to support the reclassification were that the population is geographically and genetically distinct, and plausibly contains less than 50 reproductively-active individuals.

The only presently-known summering and feeding area of the western gray whale is located off the northeast coast of Sakhalin Island. The population is believed to breed in the South China Sea during the winter months, to migrate up the east coast of Sakhalin island in May-June, and return in November. They presumably would pass the Lunskoye area on their way north to their summer feeding grounds and on their way south to their winter breeding grounds. Eastern gray whales usually stay in coastal waters during migration, except when crossing the mouths of bays, so they are likely to migrate inshore from, or perhaps through, the Lunskoye Licence Area. Their best-known feeding area is in shallow (< 20 m) water off Piltun Bay, inshore from and to the northwest of the Piltun-Astokhskoye Licence Area. During surveys in 2001, groups of western gray whales also were observed feeding in deeper waters (35-40 m water depth) southeast of Chayvo Bay, about half way between the licence areas.

Because little is known about effects of industrial activities on western gray whales, the assessment of potential impacts of the Sakhalin II Project was carried out using available information on other baleen whales, including the eastern gray whale. First, the predicted duration, geographical extent, and magnitude (% of population affected) of the impact was quantified, and then an overall magnitude of impact (negligible, moderate, or major) was assigned based on predetermined combinations of the quantified criteria.

A *major impact* would occur if the activity affects the entire population, causing a decline in abundance and/or change in distribution. Because of the very low population size, death or serious injury to even one western gray whale, or deprivation of the opportunity for a number of whales to feed adequately during a season, could so affect the population. Mitigation measures must be applied to reduce a major impact to moderate or negligible.

A *moderate impact* would occur if the activity affects a portion of the population, without threatening the integrity of the population. Temporary displacement from a migration route or interrupted feeding for a short period of time would be moderate impacts on western gray whales. Moderate impacts require the development and application of mitigation measures to reduce the impacts to as low as reasonably practicable (ALARP) levels.

A *no impact* or *negligible impact* category was assigned when potential effects were not distinguishable from natural variation or when no effects were expected because of the biology of western gray whales or their distribution in the project area. Such cases would include noise outside of their hearing range or project activities in locations where they are not known to occur. Impacts described as no impact or negligible require no specific mitigation measures to be developed.

A number of potential impacts of the project were judged to have no impact or negligible impact because of equipment and procedures built in to the project design. Those included impacts during both construction and operations phases of solid waste disposal, air emissions, effluents (oily water, domestic and sanitary waste, cooling water, industrial wastewater), and drilling muds and cuttings. Potential impacts of noise from jetty construction and TLU installation are expected to be absent because western gray whales are not known to occur in Aniva Bay.

The majority of the predicted impacts were judged to be moderate, as follows:

- Disruption of seafloor habitat and increased turbidity caused by dredging associated with the installation of platforms, cables, pipelines, and the Lunskoye landing facility could cause a temporary loss of food resources, but the area affected was a very small part of feeding habitat.
- During the construction phase of the project, noise from platform installation, support vessels, and helicopters could cause changes in behaviour, short-range avoidance movements, and possibly disruption of feeding.
- If western gray whales are migrating past the Lunskoye area during the seismic survey, noise from the airguns could cause displacement of the migration corridor by several km.
- If western gray whales are present in the Lunskoye area during the seismic survey, noise from the airguns could cause disturbance.
- During the operations phase of the project, drilling noise, other noise from platforms, and noise from maintenance of subsea structures, support vessels, and helicopters could cause changes in behaviour, short-range avoidance movements, and possibly disruption of feeding.

For some of the impacts judged to be moderate (disruption of seafloor habitat, increased turbidity), no mitigation measures were recommended because they were not possible or practical given the low magnitude of the predicted effect, or the environmental management measures built into the project. Those impacts are ALARP.

Impacts of some project activities were judged to be major, and mitigation measures were developed to reduce the predicted impacts to moderate or negligible. The major impacts were as follows:

- During the construction and operations phase of the project, the numerous vessels will be in the project area. A fatal collision with only one western gray whale could affect the survival of the entire population.
- Noise from pipeline/cable installation from the PA-A and LUN-A platforms to shore, and noise from landing pier and approach channel construction at Lunskoye could block spring northward migration to feeding areas and result in disruption of feeding. If feeding was disrupted for sufficiently long, the condition of many individuals could be adversely affected, leading to population-level impacts.
- If western gray whales feed in the Lunskoye area during the seismic survey period, feeding could be disrupted, which could lead to adverse impacts on the condition of individuals and the population. On the basis of currently-

available data, feeding of western gray whales in the Lunskoye area is unlikely, but data are insufficient to fully exclude this possibility.

- If there was a major oil spill near western gray whale feeding areas, impacts could include direct adverse impacts on the gray whales through contact with the oil and inhalation of toxic vapours, indirect adverse impacts on gray whales via effects on their food resources, or interrupted feeding by the whales.

Mitigation measures were developed for each of the major predicted impacts. In all cases, the mitigation measures were judged to be effective in reducing major impacts to moderate impacts. The measures included various procedures to reduce noise levels and control vessel movements to avoid collisions, the use of shipboard observations and aerial surveys by experienced Marine Mammal Observers to ensure that precautions are taken if western gray whales are in the vicinity, shut down of construction activities if migration appears to be blocked or feeding appears to be interrupted, and updating the Oil Spill Response Plan to explicitly protect important western gray whale habitat.

Monitoring programmes that have been funded by SEIC for several years include aerial and vessel-based surveys of western gray whale distribution, behavioural studies, photo-identification of individual western gray whales, studies of the distribution and composition of western gray whale prey, and acoustic measurements of ambient and industry-generated underwater noise. Those monitoring plans will be continued during the construction and operations phases of the Sakhalin II project. They will further our knowledge of western gray whale ecology, and will allow assessment of the extent to which mitigation measures are working, with a view to making adjustments as necessary.