



ЭКСОН НЕФТЕГАЗ ЛИМИТЕД

Оператор проекта «Сахалин-1»

EXXON NEFTEGAS LIMITED

Sakhalin-1 Project operator

**OVERVIEW
OF PLANNED MEASURES FOR
PREVENTION OF AND RESPONSE TO OIL
AND PETROLEUM PRODUCTS SPILLS
FOR SAKHALIN-1 PROJECT**

ABBREVIATIONS AND ACRONYMS USED

| Abbreviation | Definition |
|---------------------|--|
| SAR/OSR | Search and rescue readiness for oil spill response |
| ERT | Emergency response team |
| ERFSC | Emergency Response and Fire Safety Commission |
| OSR | Oil spill response |
| NERT | Non-professional ERT |
| SPNA | Specially Protected Natural Area |
| EIA | Environmental Impact Assessment |
| PERT | Professional Emergency & rescue Team |
| MPC | Maximum Permitted Concentration |
| NWS | Odoptu North Well Site |
| SWS | Odoptu South Well Site |
| E/O | Emergency resulting from oil and petroleum product spill |
| ENL | Exxon Neftegas Limited |
| ASV | Areas of Special Value |
| ICS | Incident Command System |
| OPF | Onshore Processing Facility |
| OET | Oil Export Terminal |
| ERC | Emergency Response Commission |

This document presents a summary information on the measures for prevention of and response to oil and petroleum product spills at the production facilities of ENL, Sakhalin-1 Project, provided for in the Integrated Corporate Oil and Petroleum Products Spill Response Plan for Exxon Neftegas Limited Production Facilities and the results of Environmental Impact Assessment (EIA) developed within the framework of preparation of the OSR Plan.

The purpose of this document is to inform the interested public.

Contact Information

Exxon Neftegas Limited is the Operator of Sakhalin-1 Project, one of the major projects in Russia with direct foreign investment, implemented by an international consortium. The Consortium consists of: Rosneft affiliates - RN-Astra (8.5%) and Sakhalinmorneftegaz-Shelf (11.5%); Japanese Sakhalin Oil and Gas Development Company, Ltd. (30%); Indian state-owned ONGC Videsh Ltd. (20%), and ExxonMobil (30%).

The general information on Sakhalin-1 Project, including the main development stages, news, employment opportunities, information on contract awards, on ensuring safety and environmental protection may be found on the official web-site <http://www.sakhalin-1.ru>.

For information related to the planned activities under this Plan, please contact ENL. 28, Sakhalinskaya St., Yuzhno-Sakhalinsk, Sakhalin Oblast 693000. Tel./fax: (4242) 67-70-00, 8 (495) 9805637. Contacts: Valery Kripa, phone: 8 (4242) 67-73-65.

OSR Plan Summary

The Integrated Corporate Oil and Petroleum Products Spill Response Plan for Exxon Neftegas Limited Sakhalin-1 Production Facilities has been developed in compliance with the requirements of Russian laws and regulations in the sphere of prevention of and response to oil spills to ensure the Company's readiness for prevention of and response to potential oil and petroleum product spills at Sakhalin-1 Project production facilities. The Plan contains the required information, directions and practical recommendations for organizing response to potential oil and petroleum product spills at Sakhalin-1 Project onshore and offshore production facilities.

The Integrated Corporate Oil and Petroleum Products Spill Response Plan for Exxon Neftegas Limited Sakhalin-1 Production Facilities has obtained a positive State Environmental Expert Review Conclusion approved by the Decree # 474 of August 10, 2016 of the Far East Federal District Department of the Federal Service for Environmental Management Oversight.

The main objective of planning activities for prevention of and response to oil and petroleum product spills is prevention of and response to emergency events resulting from oil and petroleum product spills as well as ensuring personnel safety and minimization of environmental impact. Planning of activities for prevention of and response to oil and petroleum product spills is aimed at ensuring the use of the best practices of prevention of oil and petroleum product spills, maintaining constant readiness of the response personnel and equipment, as well as minimizing environmental impact and losses in the case such spills occur.

In the case of an oil spill, the ENL activities strategy will be focused, on a priority basis, on the following:

- Protection of life and health of the personnel and population;
- Stopping the oil leak from the source;
- Maximum prompt and closest to the source containment of the spill;
- Efficient deployment of the oil spill containment and response personnel and equipment;
- Minimization of environmental impact;
- Protection of the special significance zones, including the Specially Protected Natural Areas (SPNA), bays and lagoons, mouths of spawning streams, locations of large gatherings of birds and marine mammals, etc.;
- Protection of property from the consequences of the oil and petroleum product spill;
- Ensuring that the OSR operations do not generate more damage than the spill itself;
- Minimization of waste generation;
- Payment of compensations and reparation of the damage to the environment from oil spills;
- Restoration and rehabilitation of the potentially affected areas.

The main tasks of planning prevention of and response to oil and petroleum product spills are as follows:

- Ensure population and personnel safety;
- Identify potential sources of oil and petroleum product spills, predict potential spills and estimate their volumes;
- Establish the E/O response managing and coordinating body, define its functions, distribute rights and responsibilities of its members;
- Determine location of the available OSR personnel and equipment, their composition, quantities, readiness;
- Establish a procedure for notification, public address and intercommunication/information exchange of the participants of the response operations;
- Prioritize actions in case of an E/O alarm;

- Organize spill containment and response operations, determine a procedure for interaction of the personnel and equipment of the organizations involved in the response activities;
- Manage the collection, transportation, and treatment of the collected oil and petroleum products;
- Ensure operational safety and provide logistical and financial support;
- Establish a procedure for interaction of the involved organizations, ENL Emergency Response and Fire Safety Commission (hereinafter referred to as "ENL ERFSC"), E/O rapid response teams, and OSR manpower and resources in emergencies;
- Substantiate what will constitute sufficient numbers, quantity, and makeup of manpower and equipment made available by the ENL ERFSCs for OSR response;
- Plan oil spill cleanup and mitigation measures.

This OSR Plan reviews the risks associated with drilling, production, transportation, storage and operation of Sakhalin-1 hydrocarbon production and transportation facilities located within Sakhalin Oblast, in the Sea of Okhotsk, in Chayvo and Piltun bays, and in Khabarovsk Krai, in the Nevelskoy Strait and Tatar Strait including Chikhachev Bay.

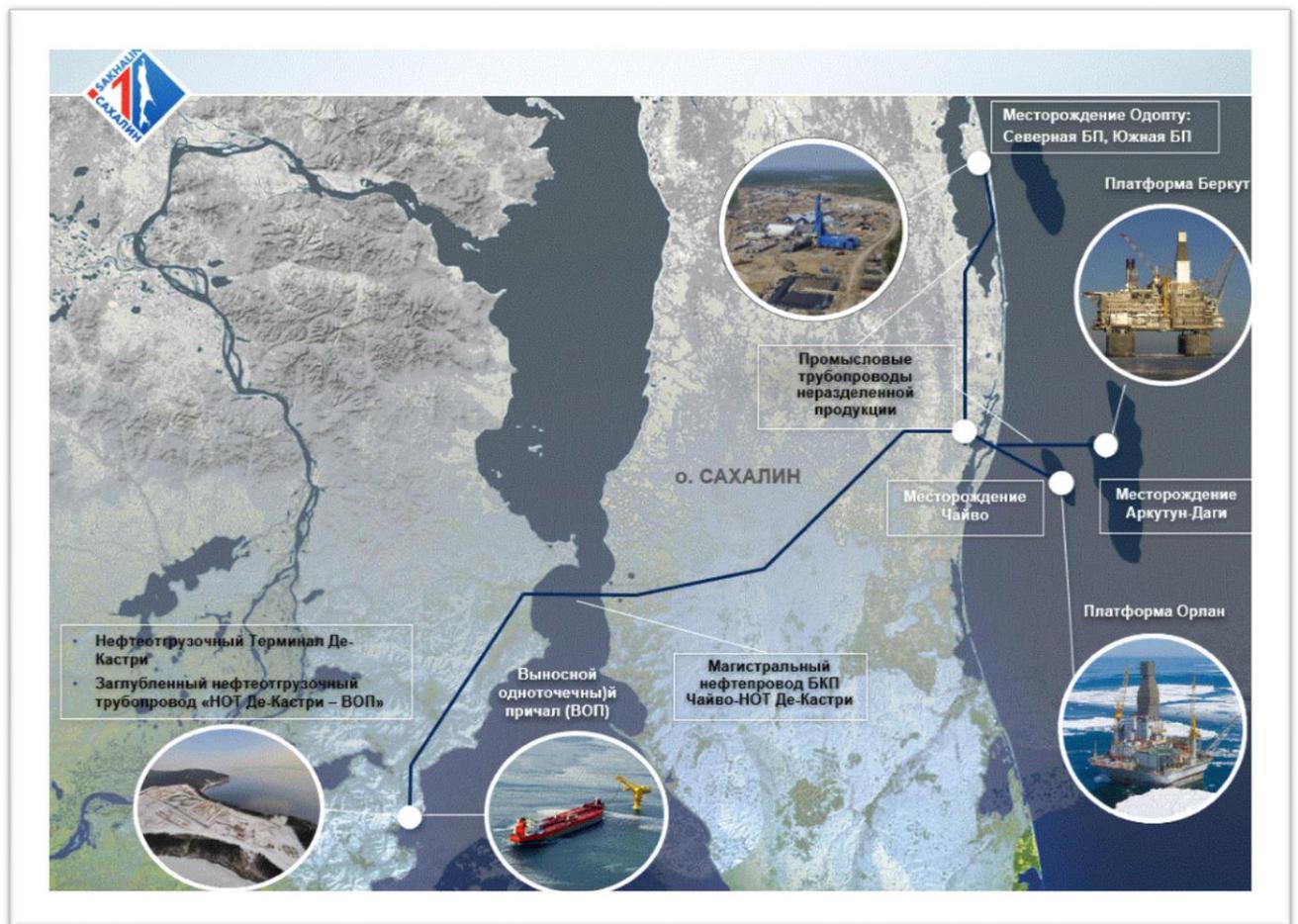


Fig.1 Sakhalin-1 Project production facilities

Spreading and movement of the oil spill on the sea surface was simulated in the SIMAP model for the worst-case scenario for the volumes calculated in accordance with the requirements of the RF Government Resolution No. 1189 of November 14, 2014 "On Management of Oil and Petroleum Product Spill Prevention and Response on the Continental

Shelf of the Russian Federation and in Inland Sea Waters, Territorial Waters, and the Contiguous Zone of the Russian Federation".

Onshore oil spills were simulated based on the maximum spill volumes in accordance with the RF Government Resolutions No. 613 of August 21, 2000, "On Emergency Actions for Oil Spill Prevention and Response", and No. 240 of April 15, 2002, "On the Procedure for Organizing Oil Spill Prevention and Response Activities in the Russian Federation". Onshore spills were simulated using OILMAP Land model for the summer and winter conditions. The oil spread area in case of an E/O will be limited by the following process engineering solutions implemented during construction of the facilities:

- The storage facilities used in the process are bunded; the area inside the bunding can hold the entire spill;
- Small capacity vessels located in special pans, which catch potential leaks and spills of oil and petroleum products;

Areas of Special Value (ASV) are defined as the areas subject to priority protection in case of oil spills. The ASVs include legislated protected areas (federal, regional, and local) and sensitive areas identified through a rigorous review process.

There are Areas of Special Value within the territories of Sakhalin Oblast and Khabarovsk Krai and within the adjacent water areas of the Sea of Okhotsk, including Chayvo Bay and Piltun Bay. Identification of these ASVs begins with locating established areas governed by special legal frameworks designed for their protection and use, or established by laws of the Russian Federation and the Sakhalin Oblast.

There are five broad classes of ASVs:

1. Environmentally sensitive areas.
2. Recreational areas and areas of high population density.
3. Commercial and other infrastructure.
4. Spawning grounds for commercial fish and habitats of rare species of animals.
5. Populated areas.

ASVs include:

- Habitats of rare and protected species of plants and animals;
- Areas of ornithological significance, such as wetlands and nearshore feeding areas;
- Colonies of seabirds and coastal birds;
- Nesting sites of rare and endangered birds;
- Summer feeding areas of gray whales;
- Seal rookeries;
- Spawning rivers over their entire course (year round).

Maps of environmental sensitivity have been developed. These show parts of the coast and the biota species requiring a priority protection from the consequences of oil spills. It should be noted that the priority protection (special value) zones are located at a significant distance from Sakhalin-1 production facilities.

Based on the risk assessment and with account for maximum potential oil spills, environmental sensitivity maps and simulation/modeling results, the required and sufficient OSR personnel and equipment have been estimated.

ENL's response personnel consist of non-professional ERT's (NERTs) members and professional (PERT) contractor teams which are on duty ensuring the emergency and rescue readiness for response to potential oil spills at each Sakhalin-1 offshore production facility. The NERTs and PERTs have OSR equipment, gear, tools and materials for search and rescue and other operations.

E/O response personnel includes non-professional ERT's (NERTs) members and professional (PERT) contractor teams at each ENL production facility.

ENL's NERT is a standalone entity established on a non-professional basis and consisting of employees. It was established by decision of ENL management for the arrangement and conducting emergency and rescue activities at the company's facilities pursuant to the guidelines of RF law. The NERT is equipped with special equipment, gear, tools and materials to conduct emergency and rescue and other activities.

The NERT was arranged by the order of ENL President #560 of March 28, 2014 and certified as required by RF law. The NERT's areas of responsibility are hazardous production facilities and pipelines of Sakhalin-1 Project

NERT's key objectives are as follows:

- Support of control bodies, personnel and equipment of emergency rescue service and constant preparedness for deployment in emergency situation areas and for emergency situation response at ENL facilities;
- Participation in the control of preparedness of serviced facilities for emergency response activities, and control of completeness and proper management of equipment;
- Emergency containment (response) activities at the serviced facilities of ENL, including the use of personal respiratory protection equipment and special emergency and rescue equipment;
- Life saving and first aid before the arrival of medical personnel at the emergency situation area;
- Participation in drafting guidelines for the arrangement and conducting of emergency response and rescue activities at the serviced facilities.

The NERT is manned by certified rescuers numbering at least 75% of the total NERT strength.

ENL's PERTs are professional rescue teams with the experience of offshore and onshore operations, with the required OSR expertise and qualification, providing search and rescue readiness services on a contract basis.

Additional local, regional, national, and/or international resources will be employed if it is necessary to expand the response organizational structure.

The NERTs and PERTs have OSR equipment, gear, tools and materials for search and rescue and other operations. ENL has a wide range of available OSR equipment, stockpiled at onshore production facilities and in the onshore base:

Within Sakhalin Oblast, at:

- Chayvo Onshore Processing Facility (OPF);
- Odoptu NWS;
- Nogliki settlement (as part of a mutual assistance arrangement with SEIC, Sakhalin-2 Operator).

Within Khabarovsk Krai, at:

- DeKastri Oil Export Terminal (OET);

OSR equipment and personnel are also available on marine vessels.



Fig.2 OSR equipment

To manage emergency response efforts, ENL employs the Incident Command System (ICS), which is used throughout ExxonMobil's worldwide operations. The ICS is a management structure that ensures that the proper levels of management, equipment, and resources are determined and deployed for any given emergency. The system is based on clear uniform procedures and terminology. The management structure essentially consists of five main functions: Incident Command, Operations, Planning, Logistics, and Finance and Administration.

The Incident Commander, in keeping with international practice and Russian Federation requirements, provides a link to the RF Unified Command System through which Federal and Regional agencies are able to coordinate response strategies and direct the efforts of the response teams. Unified Command ensures that the response actions are prioritized, coordinated, and appropriate. ENL's OSR Incident Command System is the counterpart of the Russian Federation Emergency Response and Fire Safety Commission (ERFSC)

The Incident Commander, who is also the Chairperson of the Emergency Response and Fire Safety Commission (ERFSC), directs the activities of personnel and equipment at the affected facility and organizes interaction of ENL and Contractor personnel and equipment. ENL's Production Manager may declare one of the following ICS operational modes:

- "High Alert Mode," where there is a hazard of an emergency in the Plan coverage zone;
- "Emergency Mode," for an emergency and emergency response due to incidents at ENL facilities.

The ENL's response readiness is ensured by the following measures:

- Facility ERFSCs have been formed, Emergency Response Commission organized at the ENL HQ;
- ENL management has management skills for onshore and offshore OSR operations;

- Facility personnel regularly exercise OSR equipment deployment and application of response tactics under various scenarios;
- Annual desktop exercises are conducted involving representatives of regulatory authorities and foreign specialists;
- OSR equipment is inspected and maintained on a regular basis;
- Agreement for provision of additional personnel and equipment has been concluded with SEIC, Sakhalin-2 Project Operator.

ENL has sufficient financial resources to ensure support of all necessary E/O response operations. To ensure availability of proper financial reserves, the company has:

- Insurance contracts for compensation of expenses and discharge of other liabilities resulting from an emergency situation;
- Insurance agreement for compensation of impact to environment caused by emergencies at production facilities;
- Own financial reserve approved by the relevant in-house order of the company.

ENL has sufficient resources (personnel, equipment and vessels) for response to potential oil spills within sea water areas;

The calculations support the sufficiency of:

- The quantity of the OSR equipment for containment and collection of spills, located on the vessels and in the shore bases;
- Volume of the reservoirs for temporary storage of the collected oil and water mixture;

In compliance with the Russian regulations, the Integrated Corporate Oil and Petroleum Products Spill Response Plan for Exxon Neftegas Limited Production Facilities considers all sources of oil and petroleum product spills, includes the risk assessment, identifies all vulnerable areas, determines OSR practices and technologies, describes notification in the case of an E/O, and waste management. The structure and content of the Plan conforms to all requirements of the Russian law in the sphere of prevention of and response to potential oil and petroleum product spills.

Assessment of Environmental Impact in the Case of Occurrence of and Response to Emergencies

The materials Environmental Impact Assessment (EIA) have been developed under ENL order within the “Integrated Corporate Oil and Petroleum Products Spill Response Plan for Exxon Neftegas Limited Production Facilities. Sakhalin-1 Project” (hereinafter, the Plan).

The purpose of the EIA is to assess and minimize consequences of the impact from oil spill containment and cleanup (hereinafter, OSR) at the production facilities of ENL (Sakhalin-1 Project) on the environment and the related social, economic and other consequences.

The EIA has been developed in conformance to the existing requirements of the RF regulations and guidance documents

Assessment of Impact on Atmospheric Air

The potential sources of contaminant emission into the atmospheric air during occurrence of and response to an emergency are as follows:

Water Area:

- Oil on the water surface resulting from a spill (oil evaporation from the underlying water surface);

- Engines of the Search and Rescue vessels and boom boats.

Onshore

- Oil on a solid underlying surface (evaporation from the ground);

- Engines of the Search and Rescue vessels and of the special machinery

Calculation of the pollutant dispersion in the air has been performed using UPRZA Ekolog software (version3.0), endorsed by Voeikov Main Geophysical Observatory.

An analysis of the calculation has shown that contribution of emissions from the engaged watercraft and special machinery to the air pollution level is insignificant.

The following administrative and technical measures are envisaged to reduce contaminant emissions during the period of search and rescue readiness for OSR and the response activities:

- Use of technically sound equipment, machinery and mechanisms with emissions characteristics which are in line with the existing technical standards and regulations;

- Use of the GOST-compliant grade of fuel;

- Use of vessel diesel engines which comply with MARPOL 73/78 requirements;

- Ensuring high quality and timely maintenance, and preventive maintenance, of the vessel diesel engines, equipment, machinery and mechanisms;

- Prevention of petroleum product spills from spreading over the water area through deployment of booms.

On the whole, the measures allow minimization of the impact from contaminant emissions into atmospheric air during oil spill response operations.

Assessment of Impact on Aquatic Resources

In the case of an emergency and the related response operations, the potential main sources of impact on the aquatic environment may be as follows:

- contamination of water by spilled oil;

- contamination of the shoreline protection belts by oil in case the oil slick reached the beach;

- physical presence of vessels and equipment in the water area (oil gathering vessels, boom deployment boats, skimmers, support vessels, etc.);

- water intake for process needs, including cooling of the vessel equipment engaged in the OSR operations;
- water intake for domestic needs, including by vessels;
- water intake for process purposes (cleaning of contaminated OSR equipment);
- discharge of regulatory clean, treated to standard quality water including from the cooling systems of vessels engaged in the OSR operations.

The gathered oil and water mixture:

- is injected into formation in accordance with the Licenses for the right to use subsoil resources;
- is transferred to licensed waste management companies;
- is pumped from the platform into the full well stream flowline and included in the crude stabilization process.

The following measures aimed at prevention of potential contamination of aquatic resources are envisaged to be taken during containment and subsequent cleanup of oil spills:

- sea water intake is for operation of vessel machinery only;
- vessels come to the operations site charged with water and with the cleaned tanks for waste and bilge (oily) water;
- there will be no discharge of domestic waste and bilge water into the water bodies. The transfer of the domestic waste and bilge (oily) water generated on the vessels engaged in the OSR operations is performed by specialized companies upon arrival to port;
- delivery of process and potable water for the ERT personnel engaged in the OSR operations for onshore cleanup;
- replacement of sanitary vessels (portable toilets) located at onshore operation sites, as they are filled - in accordance with the servicing agreement.

Pursuant to the requirements of MARPOL 73/78 and the Rules for Prevention of Contamination from Vessels Operating in the Marine Areas and Internal Water Ways of the Russian Federation ND 2-020101-084, the vessels engaged in the operations have all the required certificates, including Certificate for Prevention of Pollution from Vessels. This document confirms availability and technical operability of the environmental equipment as well as its conformance to the requirements for marine vessels in the sphere of ensuring protection of marine waters from pollution.

The following measures are provided to prevent secondary pollution of the water area with oil during the OSR operations:

- to avoid contamination of the vessel's hull, the vessels operate beyond the limits of the oil slick, if possible;
- cleanup of the shore, water protection zones of water bodies from the spilled oil;
- cleaning of booms, oil gathering means and special equipment from oil;
- no discharge of polluted waste water into water bodies.

The Program of the Industrial Environmental Monitoring provides for local environmental monitoring in emergency situations.

Observations of the situation will continue throughout duration of the OSR operation; their periodicity will be determined by the dynamics of the oil slick. The following parameters are mandatory to determine in a response operation: the length and area of the oil slick; its location relative to the priority protection zones; change of the oil slick or of the oil properties in time; determination of maximum concentration zones; determination of hydrocarbon concentrations in the personnel work site and the adjacent areas.

The OSR Plan measures, if procedures and timeframe are strictly followed, will minimize the risk of occurrence and consequences of the impact of the emergency on water bodies.

Assessment of Impact on Biological Communities and Environmentally Sensitive Areas

Areas of Special Value are areas requiring high-priority protection in the event of an accidental oil spill. Areas of Special Value (ASV) include legislated protected areas (federal, regional, and local) and sensitive areas identified through a rigorous review process.

For the purpose of assessment of impact on the components of the natural environment and identification the boundaries thereof, the Integrated Corporate Plan includes a description of the natural and climatic conditions of the area, identifies the vulnerable natural areas, characterizes ecological specifics in the work area, including identification of the ASVs (habitats of rare and protected species of plants and animals; zones of ornithological significance; colonies of seabirds and coastal birds; nesting sites of rare and endangered birds, summer feeding areas of gray whales; seal rookeries; spawning rivers; Specially Protected Natural Areas, etc.), and the areas environmental sensitivity maps.

The OSR Plan includes maps of the environmental sensitivity to oil and petroleum product spills of the coast and bioresources of the Sea of Okhotsk, the Tartar and Nevelskoy Straits, defines the ASV within Khabarovsk Krai and Sakhalin Oblast.

The environmental sensitivity was assessed based on the determination of the sensitivity and of ability to recover the main components of the ecosystem (plankton, benthos, fish, and marine mammals) after an oil spill.

The schematic maps of the potential vulnerability of the coastal and marine water areas, based on the integral biological characteristics, are presented below.

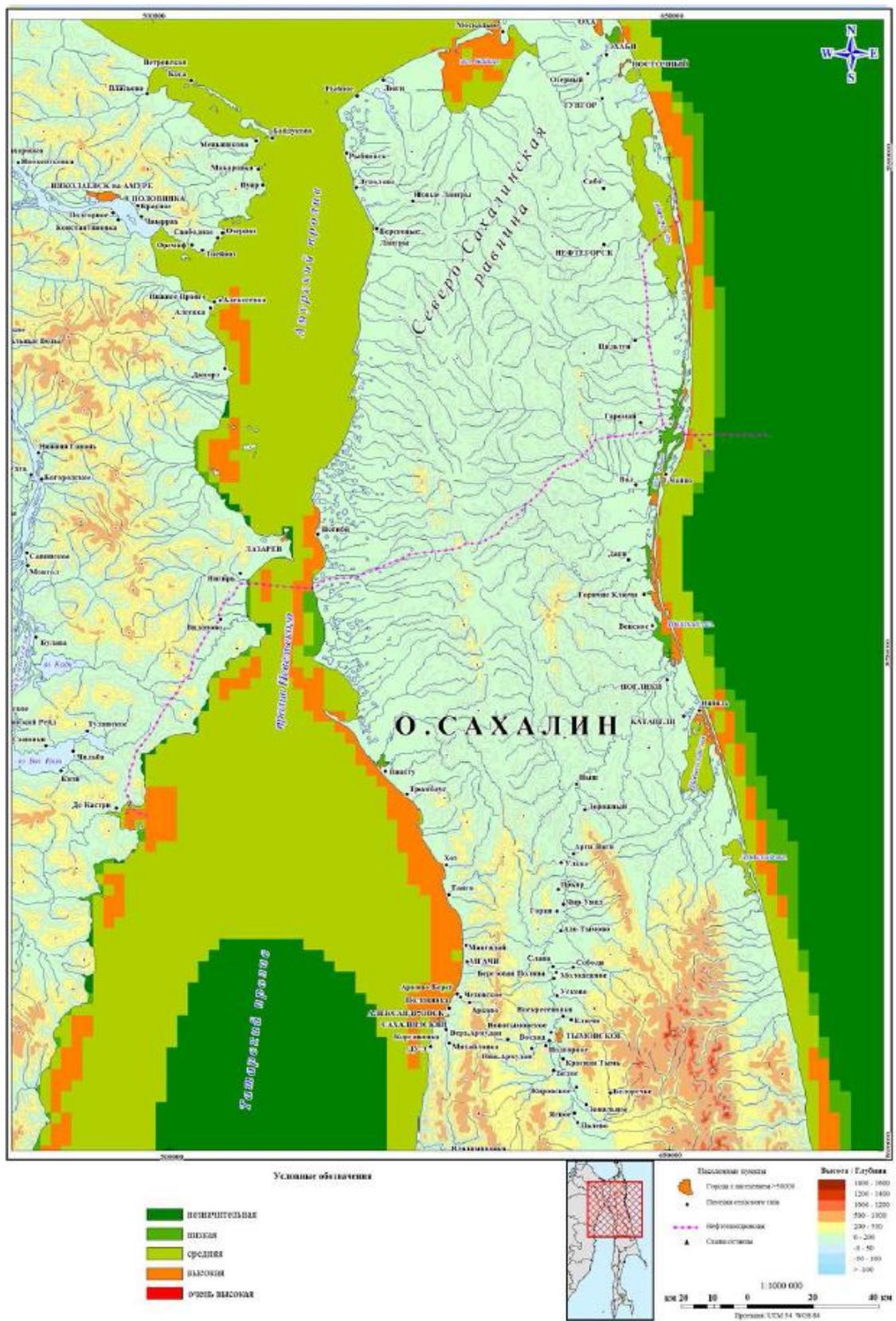


Fig.3 Potential susceptibility of near shore and offshore waters to impacts from oil slick based on integral biological characteristics. Spring season.

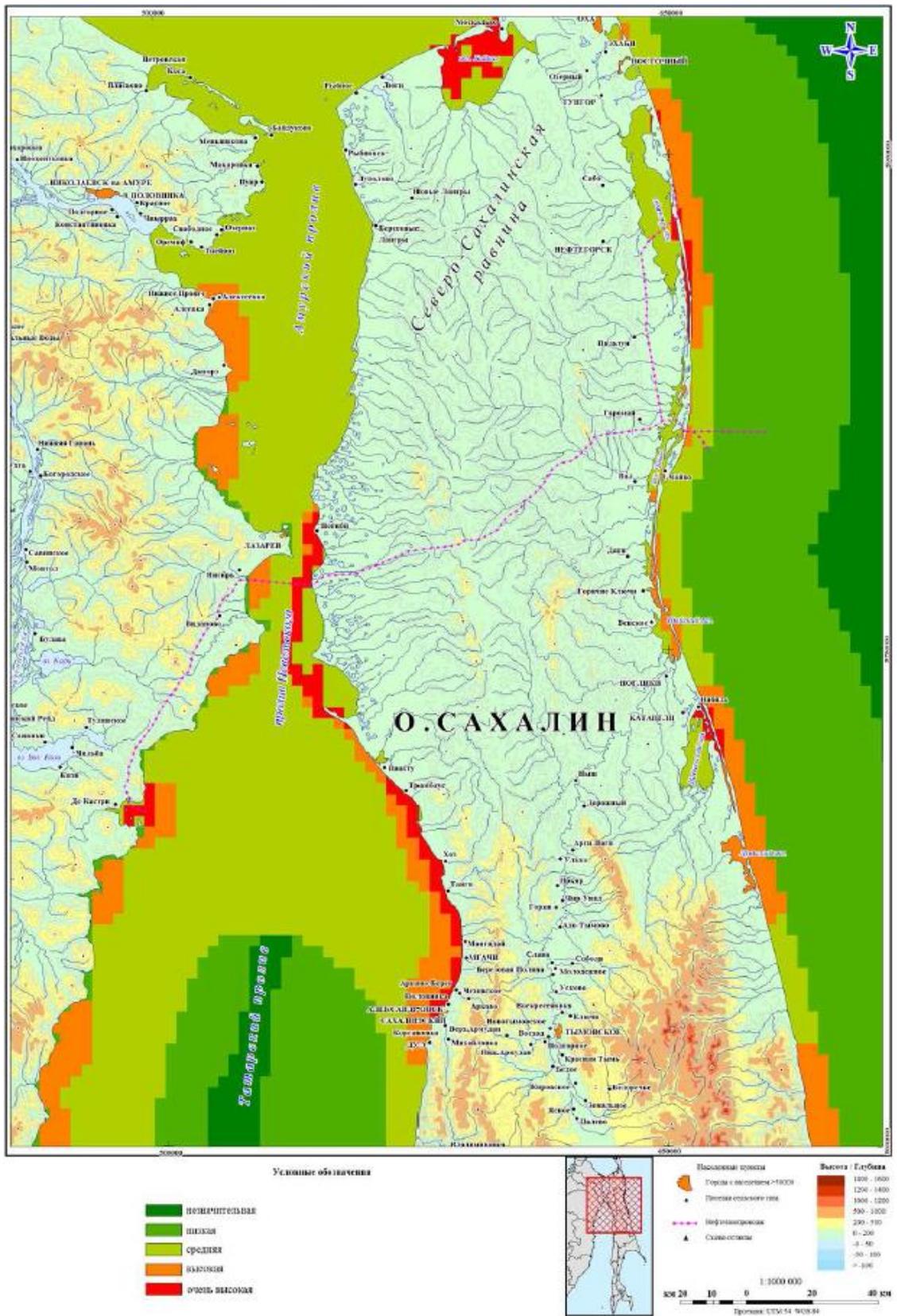


Fig. 4 Potential susceptibility of near shore and offshore waters to impacts from oil slick based on integral biological characteristics. Summer season.

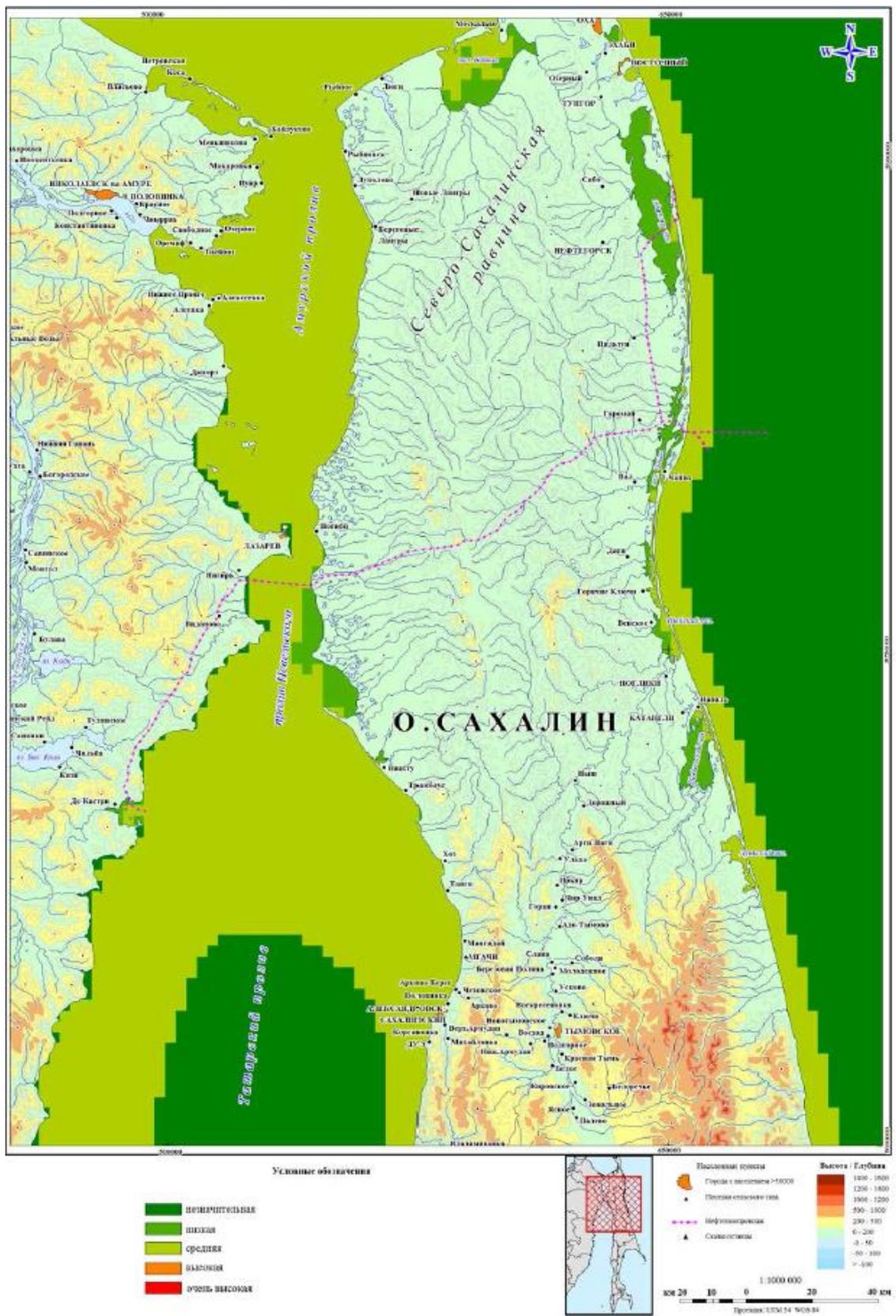


Fig.5 Potential susceptibility of near shore and offshore waters to impacts from oil slick based on integral biological characteristics. Autumn season.

Realistic minimization of the potential negative impact on the environment is the key objective of the activities aimed at protection of biological communities, environmentally sensitive areas, and special value zones in the corporate plan, along with high-priority protection of sensitive areas from oil spill pollution.

The common strategy of protecting the particularly sensitive sites in emergencies is focused on confining the oil spill and removing the oil in short time.

Spilt oil or petroleum products will be gathered to the maximum achievable degree supported by the technical characteristics of the special tools and equipment listed in the OSR Plan.

OSR operations engaging vessels and special equipment include gathering of domestic wastewater, bilge (oily) water and garbage, with subsequent transfer to licensed companies for decontamination to prevent pollution of wildlife habitats.

Upon completion of the OSR operations plans for restitution of the affected areas will be developed. The subsequent cleanup and rehabilitation operations will be performed in accordance with the rehabilitation plans (programs).

The process of rehabilitation of land disturbed by pipeline emergencies includes removal of oil and petroleum products from the soil and rehabilitation of the land areas. Rehabilitation of land potentially affected as a result of an oil spill is to be implemented by contractor resources (a specialized company).

The Integrated Corporate Plan provides for measures for wildlife rescue and rehabilitation, including spill spread containment, removal of oily debris and potentially affected food sources; reconnaissance inspections to identify oil-contaminated wildlife; release of the rehabilitated wildlife; long term observations of the released wildlife to assess effectiveness of the rehabilitation.

Special focus is made on planning the oil spill containment and removal of oil spills in the gray whales' feeding areas off north-east coast of Sakhalin island. Gray whales were included in Russia Red book as the endangered species.

ENL has developed and implemented dedicated marine mammals protection plans:

- Marine Mammals Plan in the event of oil spills from Sakhalin-1 project;
- Marine Mammals Plan for emergencies resulting from Sakhalin-1 project.

Assessment of Environmental Impact from Waste Management

The OSR Plan specifies the main sources of waste generation in case of emergencies and the response operations at the ENL production facilities.

The OSR Plan provides for the following measures:

– classification and selective gathering of wastes at their generation sources during OSR operations for subsequent transfer to the contractors or other companies licensed for waste management;

– engaging only trained employees, with the right to work in the sphere of waste management, in waste management operations;

– minimization of the quantities of the waste generation through prevention or reduction of their generation volumes during cleanup, recycling and decontamination in incinerators at the ENL production facilities;

– organizing the waste management operations so as to avoid interfering with OSR operations;

- safe handling, accumulation and transportation of oil-contaminated wastes;
- application of OSR methods that minimize waste generation;
- identification and recording of all generated wastes, labeling of the tanks/reservoirs at the generation sources to provide for subsequent transfer for decontamination, recycling or disposal;
- arranging temporary waste accumulation sites near OSR location ensuring compliance with safety rules and requirements of environmental law in the sphere of waste management;
- prompt response and change of the waste management sequence in case of a potential impact of a number of factors (oil slick movement trajectory, weather deterioration in the spill area, accessibility to the spill site).

The EIA section includes information on the types, conditions and procedure of waste management, a detailed list of the types, quantities, composition and physical and chemical properties of wastes generated during OSR operations at the ENL production facilities located within Sakhalin Oblast and Khabarovsk Krai.

The codes, names and hazard classes of the generated wastes are stated in line with the Federal Classificatory Catalogue of Wastes (hereinafter, FCCW) (approved by RPN Order #445 of July 18, 2014). Passports have been developed for all types of the hazardous wastes. The Plan includes a calculation of the quantity of the generated wastes.

The EIA section specifies the wastes and the names of the specialized and licensed companies to which the relevant wastes are planned to be transferred.

ENL has contracts for waste reception with licensed companies located within Sakhalin Oblast and Khabarovsk Krai.

The contracts (agreements) with the licensed contractor companies provide for waste handling, treatment, transportation and disposal services in conformance with the valid license for waste management as well as under contracts with third party licensed companies that provide similar services in the region under discussion.

The materials of Environmental Impact Assessment include schematic diagrams of the movement of the generated wastes under each of the emergency situation scenarios considered.

The Plan provides for sufficient personnel and equipment to ensure complete gathering of the wastes at the spill sites and their removal in compliance with the requirements of the RF environmental law in the sphere of waste management.

The OSR Plan includes measures providing for a maximum possible minimization of the waste generation, due to the following:

- prevention or reduction of the waste generation volumes via prompt and complete OSR operations;
- transfer of a significant part of the wastes gathered during the OSR operations – oil and water mixture – for injection into formation based on ENL’s licenses for the right to use subsoil resources;
- decontamination of the gathered oily soil in incinerators located at ENL production facilities in accordance with the license;
- transfer of the wastes to contractor companies licensed for waste management.

Assessment of Impact on Geological Environment and Land Resources

The following technologies will be used for cleaning of potentially affected territories:

- the territory contaminated by a thin petroleum product film will be plowed using road-building machinery (tractor);
- where plowing is not possible, the territory will be cleaned using digging tools.

The manually gathered (with digging tools) oily soil is bagged and dispatched for decontamination.

In accordance with international guidelines, cleanup of soil contaminated by a thin petroleum product film is done by plowing using road-building machinery. The plowing is a mechanical method of activation of the micro-flora that degrades hydrocarbons. Cleansing by the micro-flora is a slow but very effective method.

Upon completion of the OSR operation, plans for remediation of the affected areas are developed. These plans may provide for a long-term cultivation of the disturbed land plots, as well as for a number of other measures for melioration of the environmental conditions and achieving the net environmental benefit, including re-planting of vegetation, soil amelioration, improvement of habitats, as well as filtration and purification of waters.

Pursuant to RF Government Decree # 240 of 15.04.2002, the subsequent OSR and remediation operations at the oil-contaminated land areas and water bodies will be implemented in line with the remediation plans (programs).

These operations may be considered completed upon achievement of the permitted levels of the residual petroleum products (or their transformation products) content in the soil and ground, bottom sediments of water bodies.

The area and depth of land contamination, as well as concentrations of oil and petroleum products, are determined based on the data of the land observations and of laboratory analyses performed in compliance with the existing regulations and guidelines.

Stages of Remediation of the Oil-Contaminated Lands

The process of remediation of the land potentially disturbed and affected resulting from oil pipeline emergencies includes the following:

- removal of oil and petroleum products from soil;
- remediation of the land (technical and biological stages).

Upon completion of the operations, the remediated land and the adjacent territory should present an optimally arranged and environmentally balanced landscape.

In the case of a moderate contamination, just the technical stage of remediation is sufficient.

Technical Stage of Remediation

The following main operations should be implemented under the technical stage of remediation, depending on the land category:

- removal of boulders, industrial structural elements and construction debris, with subsequent disposal or storage;
- construction of access roads to the remediated areas, approaches to them and roads within, providing for movement of agricultural, forestry and other machinery; removal or use of dams, dikes, mounds; filling of man-made lakes and streams, improvement of river beds; creation and improvement of the structure of the remediated layer, reclamation of toxic rock and soil where their burial under a layer of potentially fertile soil is not possible;
- creation of a screening layer, if required;
- covering of the surface with potentially fertile and/or fertile soil layers;
- anti-erosion protection of the territory.

Biological Stage of Remediation

The biological stage will be implemented upon full completion of the technical stage of the reinstatement of the fertile soil layer in accordance with GOST 17.5.3.06-85, in combination with mechanical methods. The operations under the biological stage must be implemented with account for the remediation requirements depending on the land category. The process of

biodegradation of oil and petroleum products within the severely contaminated areas can be accelerated by using of biological preparations approved by the governmental agencies.

Measures for Ensuring Safety of ENL Personnel and of the Public

In case of an emergency situation, and based on the developing conditions, to ensure safety and protection of public, a range of legal, organizational, environmental, sanitary and hygienic, sanitary-epidemiological and special measures aimed at prevention or a maximum possible minimization of the threat to life and health of people, loss of their property or misbalance of their living conditions in the emergency situation zones are implemented in accordance with the requirements of Federal Law #68-FZ of December 11, 1994 “Protection of Population and Territories from Natural and Man-Made Emergency Situations”.

The OSR operations include a continuous assessment of the situation in relation to the safety of the operations and health of the responders, as protection of human life and prevention of traumas is the most important goal of the operations.

The key first priority measures for protection of personnel and public as well as provision of medical help to the injured are as follows:

- timely notification of personnel and public of the E/O, and advising them on the subsequent actions;
- evacuation of people from the E/O zone;
- use of the PPE for protection of respiratory organs and skin, as required;
- provision of the first premedical aid to the injured and organization of their transportation to a medical establishment;
- implementation of the emergency rescue operations and safety measures in the E/O zone;
- compliance with the operation procedures and safety measures in the oil spill zone;
- limitation of access of unauthorized persons to the location of the spill and maintenance of public order.

The first priority measures for ensuring safety will be aimed at (listed by priority):

- ensuring safety of people
- protection of Specially Protected Natural Areas.

Local Environmental Monitoring

The purpose of the local environmental monitoring in case of an E/O is to obtain information on the spill nature and location, volume of the spilled oil, and hydrometeorological conditions, which is necessary for the timely and adequate response to the spill.

The following is determined in the process of monitoring of the situation at the spill location:

- presence of injured persons; assessment of the threat to the safety of ENL’s personnel and the crews of the support vessels providing the SAR/OSR duties, as well as the potential danger for the personnel to be engaged in the OSR operations;
- concentrations of hydrocarbons in the personnel operation area and the adjacent territories;
- the source of the spill, if not already known;
- conditions of the spill propagation (whether the oil ingress into environment has stopped or continues);

- approximate volume of the spill, its area, and orientation, length and width of the slick;
- dynamics of the oil contamination characteristics or oil properties over time, and the maximum oil concentration zones;
- location of the oil spill in relation to the priority protection zones;
- weather conditions (speed and direction of the wind, air and water temperature);
- speed and direction of the oil slick movement;
- need to engage additional OSR personnel and equipment.

Monitoring of the situation in the water area can be done from the vessels immediately engaged in the OSR operations. Observations of the situation are conducted throughout the OSR operation duration; their periodicity is determined by the dynamics of the oil propagation over the water area.

The objective of the environmental monitoring in the oil spill area is to identify negative characteristics of the spill (specifically, concentration of oil vapors and metocean parameters), which may affect safety of OSR operations (including personnel and OSR equipment).

Measurement of crude oil vapors in the ambient air of the area of offshore shall be performed by trained personnel from the engaged professional emergency response team, who will use gas analyzers that are available with the team in accordance with the list of equipment for the ERT certificate. Operations manager will use the data on spilt oil vapor concentration in the spill zone to decide whether personnel may be admitted to the zone to operate.

The data from monitoring during the spill response activities will have direct impact on the priorities, strategy and methods used in response operations.

There are three mutually reinforcing activities, which are the key to successful monitoring:

- compare the data sets from before and after the oil spill occurrence;
- compare the data from the affected and unaffected reference areas;
- tracking the changes as time progresses.

Operational environmental control (monitoring) that follows oil spill response operations, includes a set of activities aimed at appraising actual condition of the following environment components:

- natural (sea) waters including metocean characteristics;
- seabed sediments;
- aquatic bioresources;
- soil and subsoil ;
- animal communities in the surface ecosystems, ornithofauna and marine mammals;
- vegetation in the onshore (coastal zone) and offshore (macrophytes) ecosystems.

Oiled Wildlife Response Guidelines

Protection of wildlife from contact with oil will be carried out by OSR teams, government agencies, and experienced wildlife rehabilitators utilizing the following, and other similar, documents for guidance:

- Wildlife Response Manual. Exxon Neftegas Limited. May 2006.
- ExxonMobil Oil Spill Response Field Manual (2008); Section 13. Wildlife Rescue and

Rehabilitation (2008).

- A Guide to Oiled Wildlife Response Planning. International Petroleum Industry Environmental Conservation Association (IPIECA). 2004.

The primary strategy for wildlife protection is controlling the spread of spilled oil to prevent or reduce oil contamination of potentially affected species and habitats. Removal of oiled debris and potentially impacted food sources also protects wildlife.

Protecting wildlife is one of the priorities of OSR after the safety of personnel and the public is ensured and the oil source is contained. It is classified as one of the tasks in preventing contamination of areas of special value and features that are environmentally vulnerable to oil contamination.

The basic methods of wildlife protection include:

- Containing and enclosing oiled areas;
- Wildlife deterrence (hazing);
- Capture and rehabilitation of oiled wildlife.

Conclusion

Objectives of planning the oil/products spill prevention and response activities are:

- performance of early activities preventing emergencies resulting from oil and products spill (E/O);
- maintaining constant readiness of the resources and personnel for E/O response;
- ensuring safety of communities and territories;
- minimizing potential impact and loss in the event of an E/O;
- complying with Russian regulatory requirements, international treaties, conventions where they concern prohibition or control of the hazardous substances and materials use in operations and, reducing hazardous emissions.

A preliminary environmental impact assessment was performed aiming to incorporate the environmental requirements for the oil/product spill prevention and response. The EIA helped identify sources of impact on certain components of the environment, define their nature, specifics and directions, forecast potential negative impacts related to occurrence of emergencies on Sakhalin-1 facilities and ways to respond to the consequences.

A list of environmental measures aimed to reduce or mitigate negative environmental impact during OSR operations has been developed.

The impacts and their respective levels identified do not conflict with the Russian or international environmental regulatory requirements and are permissible, subject to mandatory compliance with the developed plan and conducting environmental monitoring.

The process of planning of oil/products spill prevention and response measures is in compliance with the approved operating modes of process and environmental equipment, and with the current regulatory requirements.

ENL has concluded an environmental insurance agreement with AO SOGAZ to support the activities included in the oil/products spill prevention and response plan, which provides for a compensation for environmental impact, including impact on aquatic bioresources and/or life, health or property of any third party that may result from oil/products spill.

It is planned to arrange local environmental monitoring. The monitoring program includes water bodies' condition, seabed sediments, vegetation, snow cover, noise pollution control, aquatic

bioresources, top soil, ornithofauna and marine mammals, plant communities in onshore and offshore ecosystems.