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**STRATEGIC ACTION PROGRAM  
FOR PROTECTION OF ENVIRONMENT IN THE  
ARCTIC ZONE OF THE RUSSIAN FEDERATION**

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Prepared by: SAP-TT and Project Office taking into account  
comments of Inter-Agency Working Group at the  
meeting on February 27, 2009

Required actions: for approval

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Moscow, 2009

## LIST OF ACRONYMS

ACAP	Arctic Contaminants Action Program - Arctic Council Working Group
AMAP	Arctic Monitoring and Assessment Program - Arctic Council Working Group
CAFF	Conservation of Arctic Flora and Fauna - Arctic Council Working Group
CCA	Causal-Chain Analysis
FTOP	Federal Target- Oriented Programme
EPPR	Emergency, Prevention, Preparedness and Response - Arctic Council Working Group
EPS	Environmental Protection System
EQG	Environmental Quality Goals
ESI	Environmental Status Indicator
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIWA	Global International Waters Assessment Project
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities
IWG	Interagency Working Group
JI	Joint Implementation
MAC	Maximum allowable concentrations
NEFCO	Nordic Environmental Financial Corporation
NPA-Arctic	UNEP/GEF Project "Russian Federation – Support for the National Plan of Action for Protection of the Arctic Marine Environment"
PAME	Protection of the Arctic Marine Environment - Arctic Council Working Group
PI	Process Indicator
POP	Persistent organic pollutants
PPP	Private Public Partnership
R&D	Research and Development
RF	Russian Federation
RITEG	Radioisotope thermo electric generators
RPA	Regional Programme of Action for the Protection of the Marine Environment from Land-Based Activities
SAP-Arctic	Strategic Action Program for Protection of Environment in the Arctic Zone of the Russian Federation
SAP-TT	Strategic Action Program Task Team
SDWG	Sustainable Development Working Group Response - Arctic Council Working Group

SEA	Strategic Environmental Assessment
SRI	Stress Reduction Indicator
UNDP	United Nations Development Programme
UNECE	United Nations European Economic Commission
UNEP	United Nations Environment Programme
USSR	The Union of the Soviet Socialist Republics

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## INTRODUCTION

The Strategic Action Program for Protection of Environment in the Arctic Zone of the Russian Federation (SAP-Arctic), which has been prepared under the auspices of the UN Environment Programme/Global Environment Facility project "Russian Federation – Support for the National Plan of Action for Protection of the Arctic Marine Environment (NPA-Arctic)," is a fundamentally new stage in the development of the NPA-Arctic. The main priorities and work plan of the SAP-Arctic are based on a diagnostic analysis of the environmental problems of the Arctic Zone of the Russian Federation, with due attention to trans-boundary influences, as well as on consultations with representatives of federal, regional, and local governments, the business community, and the public. SAP-Arctic considers priority environmental problems, defines strategic objectives, targets and indicators for achievement of the objectives and list of priority environmental activities in the Arctic Zone of the Russian Federation.

The timeliness of the SAP-Arctic arises from the need to solve the problems of accumulated environmental damage, and to prevent the emergence of new environmental damage, in the Russian Arctic, particularly in light of increasing development pressure and the overarching implications of climate change in the region. The present unsatisfactory condition of the environment in the Arctic Zone is the result of large-scale development of production and the extraction of valuable mineral resources. The impact of global climate change has intensified the adverse impacts of anthropogenic factors in the Arctic Zone. According to the diagnostic analysis, the principal factors affecting the condition of the environment in the Arctic Zone are as follows:

- increasing pollution and degradation of fragile Arctic ecosystems in conditions of increasing anthropogenic pressure, including pollution brought in by transboundary transport;
- the extremely long periods of time required for restoration of degraded Arctic ecosystems;
- deterioration in the living conditions of the native population, including the small nations of the North;
- substantial ecological risks associated with development of relatively inaccessible natural resources, transportation operations, and implementation of high-technology and energy-intensive projects;
- heightened natural and human-caused risks and damages associated related to climate change, particularly hydrometeorological, geomorphological, and other unfavorable natural processes and phenomena impacting permafrost and ice formation and retention .

Since the 1930s, the region has seen the intensive development of mining, metallurgical, forestry, wood products, pulp-and-paper, and other branches of industry as well as transportation. In recent decades, the increasingly rapid development of the oil and gas sector in Western Siberia and the planned development of the continental shelf of the Barents Sea and other Arctic seas has intensified the threat that degradation of the environment on a local scale that can grow into a larger regional problem. Problems of environmental protection in the Russian Arctic have been a constant focus of the Government of the Russian Federation, and the ways and means of solving these problems

have been given consideration in a number of strategic planning documents, including those devoted to the social and economic development of northern regions. Nevertheless, decisions at the government level have had little effect until recently.

Increased production and growth of the gross regional product in almost all the constituent subjects in the Arctic Zone, as observed since 2000 and are projected to continue into the future, will undoubtedly lead to an increased burden on the region's environment. This already requires urgent actions both to eliminate existing environmental damage and to avert rising environmental threats. Improving environmental quality in the Arctic Zone means the necessity of developing environmental regulations and stimulating energy-saving and environmental production and types of activity as well as addressing past environmental damage. Incentives to accomplish this should be given greater attention. Because of its exceptional geopolitical, resource, environmental, scientific, and cultural importance, the Arctic Zone should be made a strategic element in the regional development of the Russian Federation.

SAP-Arctic is directed to preservation and protection of Arctic environment, elimination of environmental consequences of economic activities in conditions of increasing economic activity and global climate changes. Implementation of the SAP-Arctic is to be the Russian Federation's contribution to the Global Program of Action for Protection of the Marine Environment from Land-based Activities, to fulfillment of the decisions of the inter-governmental Arctic Council in the area of sustainable development and protection of the Arctic environment, and to the development of cooperation with all Arctic countries so as to resolve the problems of the Arctic. SAP-Arctic is a framework document which provisions are taken into account for development of governmental, federal, sectoral, regional and corporate programs.

## **Section 1. Fundamentals and Principles of the SAP-Arctic**

### ***1.1 Geographic Scope of the SAP-Arctic***

In accordance with the "Basic Principles of the State Policy of the Russian Federation in the Arctic until 2020 and further prospective," approved by the President of the Russian Federation on September 18, 2008 (# Pr-1969), the Arctic Zone of the Russian Federation comprises of all or parts of the territories of the Republic of Sakha (Yakutia), Murmansk and Arkhangelsk oblasts, Krasnoyarsk Krai, and the Nenets, Yamalo-Nenets, and Chukotka autonomous okrugs defined by the State Commission on Arctic Affairs under the USSR Council of Ministers, April 22, 1989, as well as the lands and islands named in the Decree of the Presidium of the USSR Central Executive Committee of April 15, 1926, "On Declaration of the Lands and Islands Located in the Arctic Ocean as Territory of the USSR" and the internal marine waters adjacent to these territories, lands, and islands of the Russian Federation, as well as the territorial sea, exclusive economic zone, and continental shelf of the Russian Federation within the boundaries of which Russia enjoys sovereign rights and jurisdiction in accordance with international law.

Boundaries of the Arctic Zone of the Russian Federation can be further emended in line with legislation of the Russian Federation as well as with norms of international agreements and conventions for which Russia is a party.

The territory of the Arctic Zone of the Russian Federation extends over more than 6 million square kilometers (k2) in total. It comprises the Arctic marine expanses within the territorial sea and exclusive economic zone of the Russian Federation – more than 3 million

k2. The Arctic seas of Russia include the Barents, White, Kara, Laptev, East Siberian, Chukchi, and Bering seas. The land area of the Russian Arctic is about 18 percent of the entire territory of Russia.

The SAP-Arctic covers primarily the Arctic Zone of the Russian Federation. However, it also comprises the Komi Republic and Khanty-Mansy Autonomous Okrug, both of which hold sources of pollution that substantially affect the condition of the Arctic marine environment.

## **1.2. Physical, Geographic and Socioeconomic Features of the Russian Arctic**

The Arctic is ill-suited to comfortable human habitation and is characterized by harsh natural and climatic conditions:

- low temperatures throughout the year, a long polar night and polar day, frequent magnetic storms that produce thinning of the ozone layer, strong winds and snowstorms, frequent fogs, the monotonous topography of polar desert and Arctic tundra, perennially frozen ground, an ice regime that lasts more than six months of the year, terrestrial glaciations on several islands, and other extreme natural features;
- unstable and fragile ecosystems, which are easily impaired by human-caused impacts and take many years to recover;
- pollution of the Arctic Ocean, principally by transboundary atmospheric transport as well as by large rivers (Northern Dvina, Pechora, Ob, Yenisei, Lena, Indigirka, Yana, and Kolyma rivers), which drain the greater part of Eurasia, including areas with developed industrial and agricultural infrastructure;
- global climate change, which since the turn of the last century is manifesting itself with great force and on a very large scale and which in several Arctic districts has had adverse impacts on the natural environment, the economy, and the resident human population.

The Arctic Ocean and its seas are globally significant because of their influence on oceanic and atmospheric circulation and because of their unique biological species, which are an essential component of global biodiversity. The Arctic makes an important contribution to the Earth's climate stability, the global carbon balance, and the preservation of the ethnic and cultural diversity of, and traditional natural resource use by, the northern peoples. Hydrocarbons and minerals are found in quantities that are of strategic importance on a planetary scale, as well as fisheries resources and large areas for raising domestic reindeer. Seasonal assemblages of marine mammals, especially whales and other cetaceans, occur over large areas; and bird populations in the millions find nesting grounds and flyways here. The Arctic marine environment is home to many unique and endemic species, the best known of which are polar bear, narwhal, walrus, and beluga whales. Arctic and sub-Arctic waters hold more than 400 species of fish, including 115 freshwater species.

The distinguishing socioeconomic features of the region include:

- low population density and widely dispersed human settlements;
- uneven economic development, in which much of the mainland Arctic Zone is characterized by traditional settlements of the indigenous small nations together with scattered centers of intensive industrial development;
- living and economic conditions that are dependent on supplies of fuel, produce, and

- a monotypic, resource-based economy in the Arctic subjects of the Russian Federation, with high costs for supporting economic activity and maintaining the well-being of the people;
- inadequate environmental investments by the government and relatively low environmental investments (low compared to the level of environmental damage) by private companies.

More than a million people live and work in the Arctic Zone of the Russian Federation, including 136,000 members of 16 indigenous small nations of the North (Saami, Nentsy, Khanty, Mansy, Selkupy, Kety, Entsy, Nganasany, Dolgany, Evenki, Eveny, Yukagiry, Chukchi, Eskimos, Kereki, and Chuvantsy). As a rule, these nations live in their native villages and lead a nomadic way of life.

The natural, climatic, and socioeconomic features of the region require a thorough consideration of economic development issues when protecting environmental quality, protecting human health, and preserving traditional nature use. The comprehensive approach used in developing the SAP-Arctic should further be integrated into all political and sectoral strategies, programs, and plans in the Arctic Zone, including the development of industry, oil and gas fields, fisheries, aquaculture, and tourism and the development of the social sphere and scientific research.

### ***1.3. Principles for the Development of the SAP-Arctic***

The following principles lie at the heart of developing the SAP-Arctic:

The principle of **sustainable development**, which calls for a balanced approach to socioeconomic issues and preserving a healthy environment and natural resources, for the purpose of satisfying the needs of present and future generations

The **precautionary** principle, which is meant to avert the threat that economic activity will lead to adverse environmental and related social and economic consequences, by means of conducting environmental impact assessments and strategic environmental assessments (including assessments of the environmental and social consequences of government policies, programs, and plans) when preparing and making economic decisions. This principle means that the consequences of actions and decisions capable of causing serious or irreversible changes for the environment and people of the Arctic Zone of the Russian Federation, even in the absence of compelling scientific evidence with regard to the causal relationships between action and effect, are the responsibility of those who make the decisions.

The principle of the **“polluter pays”** (payment for natural resource use and compensation for damage done to the environment), which says that juridical and physical persons that inflict damage on the environment – in the form of pollution, depletion, spoilage, destruction, irrational natural resource use, degradation, and impairment of natural ecosystems, natural complexes, and natural landscapes and other violations of environmental law – must pay for such damage in full and in accordance with the law.

The principle of **preventive action**, which consists of taking timely actions to eliminate current and potential sources/causes of unfavorable impacts on the environment and to inform the responsible authorities and other interested executive bodies about possible consequences arising from impacts on the environment.

The principle of an **ecosystem approach to the solution of environmental problems**, which means comprehensive and integrated management of the land, water, and biological resources of the Arctic Zone; as will provide for resource conservation and sustainable use on an equitable basis.

The principle of **accessibility of environmental information**, which means informing all interested parties, including the public, about present contamination of the Arctic environment and potential future risks ;

The principle of **partnership**, which refers to the creation of political, institutional, and economic conditions for participation in decision-making affecting the condition of the Arctic marine environment, as well as in the implementation of SAP-Arctic activities by various interested groups – state and municipal executive and management bodies, government institutions, business organizations, non-governmental organizations, and private persons.

An important feature of the development of the SAP-Arctic is that it takes a systems approach, which comprises the identification of priorities, the definition of goals and objectives, the development of specific activities and performance indicators, monitoring of results, and plan adjustments.

## **Section 2. Priority Environmental Problems of the Arctic Zone of the Russian Federation**

The geographic location of the Russian Arctic, the enormous expanses of land and sea, the exceptional natural diversity and extreme natural and climatic conditions, and the different levels of economic development, infrastructure, and settlement patterns – all these make it comparatively difficult to identify high-priority environmental problems and strategies that are the same for the entire Arctic regions of Russia.

First, even such obvious environmental problems as pollution, degradation of terrestrial ecosystems, and depletion of the stocks of biological resources tend to be regionally specific with regard to severity and scale. Second, the traditions of economic development of individual regions of the Arctic, as before, remain differentiated in terms of demographic, economic, and social and cultural tendencies, which are very conservative even in the context of new industrial development. Third, the systems that have taken shape for management, as well as for interactions among Arctic regions, with neighboring regions of Russia, and with neighboring countries, have different degrees of receptiveness with regard to centralized decision-making system. In addition, the Arctic regions differ substantially in relation to participation of governmental, public-private, and private structures in environmental decision-making and in the economic coordination and competition that ensure minimal impacts on the environment.

In prioritizing environmental problems in the Arctic Zone, approaches and criteria were used that are accepted in the methodology of the Global Environmental Facility and the Global International Waters Assessment. These provide for (1) quantitative assessment and ranking of environmental problems by priority (Appendix1), (2) identification of core, indirect, and sectoral reasons underlying these problems, and (3) a causal-chain analysis (Appendix 2).

Analysis of the current condition of and predicted changes in the environment in the Arctic Zone has identified five environmental problems, given below in order of priority.

### **1. Environmental pollution (transboundary transport of pollutants by water and air, and oil, chemical, and radiation contamination) and deterioration of the**

**quality of surface and ground waters in the coastal areas of the Arctic Zone;**

**2. Changes in biodiversity and depletion of biological resources;**

**3. Deterioration in the living environment of the indigenous population of the Arctic Zone and disruptions in the conditions of natural resource use by the indigenous small nations.**

**4. Adverse consequences and threats associated with global climate change**

**5. Land degradation and land-use impairments.**

The SAP-Arctic covers the environmental consequences of human activities on the land and sea; however, coverage of impacts on the sea is limited to the development of the oil and gas resources of the Arctic shelf, the transport of oil and gas, and shipping

### ***2.1. Environmental pollution and the improvement of surface water quality and ground water quality in coastal areas of the Arctic Zone***

The Arctic is one of the Russian regions most vulnerable to environmental pollution. The most important environmental problems in the Arctic Zone are associated primarily with the presence of “hot spots” in areas of intensive economic activity, above all by resource-extractive industries. At present, more than 100 hot spots have been identified throughout the Arctic Zone, among them 30 with the most severe environmental problems (Appendix 3). The most dangerous types of pollution in the region are contamination by petroleum and petroleum products, chemical contamination by heavy metals, persistent organic pollutants (POPs), and solid waste; and radiation contamination.

Increased technogenic loading (wastewater discharges, atmospheric emissions, solid waste accumulation) has grown hand in hand with the industrial development of the Arctic Zone, reaching a critical level in several regions (Kola Peninsula, Norilsk area). The bottom sediments of many lakes and rivers in the Arctic Zone have accumulated significant amounts of heavy metals and other pollutants. The climatic and geographical features of the Arctic contribute to a preponderance of the most toxic ionic forms of heavy metals in its natural waters. Many regions in the Arctic Zone have seen the formation of man-made geochemical provinces with exceptionally high concentrations of toxic metals. Acid rain causes metals to leach from tailings ponds and piles of mining overburden and slag and thence into rivers, lakes, and seas. An especially dangerous situation occurs during the spring thaw, when the toxic forms of metals accumulated during the winter flow in large quantities into water bodies. In sum, the population in a region that has safe drinking water often faces a shortage of safe drinking water.

**The sources of environmental pollution in the Russian Arctic** are as follows:

- Transboundary atmospheric and aquatic transport of pollutants;
- Solid waste accumulation from production and consumption;
- pollutant runoff into river waters;
- the discharge of polluted wastewater by industrial enterprises, municipal facilities, and mobile sources (all types of transport, including marine and river fleets, aircraft, vehicles, and oil pipelines) into the sea and the rivers that empty into the sea;
- spills of petroleum and petroleum products on land and sea;
- atmospheric transport of the products of fuel combustion, the decomposition and evaporation of petroleum, dust, and heavy metals from adjacent industrial areas;

- transport of pollutants by the marine water masses of the Gulf Stream system
- illegal and unsupervised disposal of industrial wastes
- the thawing of marine and river ice polluted by petroleum products and other pollutants;
- natural siphoning sources in oil and gas regions on the shelf zone of the Arctic seacoasts.
- the operation of engineering facilities on the continental shelf and in the coastal zone of the Arctic seas.

**Transboundary atmospheric and aquatic transport of pollutants** is the highest-priority problem for the Russian Arctic, principally because the region receives more transboundary pollution than it generates. Because of tropospheric transport, the Arctic Zone is becoming a region of global deposition of the pollutants accumulated as a result of atmospheric emissions of Western Europe, North America, and Asia. In addition, two large polluted areas capable of contributing to tropospheric transboundary transport have formed in the Arctic Zone – the Kola Peninsula and Norilsk. Every year, about 4 million metric tons of sulfur dioxide and hundreds of thousands of metric tons of carbon monoxide and nitrogen oxides enter into the atmosphere in these regions. The main pollutants involved in the two-way transboundary transfer of atmospheric and water currents in the Arctic Zone are sulfates, sulfides and chlorides, phosphates, petroleum products, and chlororganic substances.

**Solid waste accumulation** from production and consumption in the Arctic region occurs because there are no systems for disposal and recycling of waste, no well-worked-out network for waste collection and utilization, including the mine and processing waste that prevails in the overall volume of industrial waste in the region. Up to 1 million tonnes of waste rock and solid waste are generated every year in the Arctic Zone. Large areas of waste piles and solid waste are concentrated in Murmansk Oblast, the lower reaches of the Pechora River in the Nenets Autonomous Okrug, in the southern part of the Yamalo-Nenets Autonomous Okrug, in the Norilsk Industrial District, in northern Yakutia, and adjacent to gold-mining districts on the Chukchi Peninsula. The consequences of unregulated waste build-up are continual pollution of the land, ground waters, and soils; the degradation of natural ecosystems, the destruction of traditional plant and animal habitats, and the formation of new man-made habitats populated by associations of introduced plant species.

**Oil pollution.** Oil pollution of the external environment of Arctic basin reached high level. Every year several hundred thousand tones of petroleum products are transported by river into the Arctic seas. transported by river into the Arctic seas (from 360,000 in 1997 to 250,000 in 2003) . Severe pollution of surface waters has been found beyond the boundaries of oil- and gas-bearing deposits and even the petroleum basins. There are data that show that in the ground waters of the Middle Ob Oil and Gas District (Western Siberia) there are petroleum hydrocarbons, phenols, and other pollutants associated with oil and gas production in concentrations that exceed the maximum allowable concentrations (MACs). The concentration of petroleum products found in ground waters in certain sectors of the Timan-Pechora Oil and Gas Basin reaches levels equivalent to several dozens MACs. In Tiumen Oblast alone, owing to chemical contamination by petroleum, petroleum products, and ethylene glycol, more than 200 rivers have completely lost their commercial fisheries.

Prior to the onset of large-scale projects for the extraction of hydrocarbons on the continental shelf of the Barents and Kara seas, the appearance of crude oil in marine

waters, in freshwater bodies, and on the shores of the Arctic Zone, was limited in character and cannot be seen as a factor that seriously complicated the environmental situation in the region.

The future threat of oil pollution of the marine environment is tied to plans for oil drilling on the continental shelf of the Russian Federation. Oil extraction in the Russian Arctic is based on fields already opened – Prirazlomnoe, Shtokman, Sever-Medyn, Sever-Guliaev, Varandei Sea, Pomorie, Dolgan, and others – and it will grow as other promising fields are opened up. Most hydrocarbon resources (about 70 percent) are in the seas of the western Arctic – the Barents, Pechora, and Kara seas. The transport of oil along sea-lanes in the Atlantic sector will increase several times over; and in particular, this will take place in the next ten years in the White, Barents, and Pechora seas.

**Chemical contamination** in the Arctic poses a hazard because of the low assimilative capacity of its marine and terrestrial ecosystems and biota. The concentration of heavy metals in soils, plants, and animals, in water and snow, in sea ice and bottom sediments is increasing almost everywhere. More than 30 percent of polluted wastewater discharges are into the aquatic ecosystems of the region. Many marine expanses of the Barents, White, Kara, and Laptev seas hold concentrations of pollutants that exceed maximum allowable concentrations by two or three times over. Kola Bay, the Barents Sea, the Pechora Sea and lower reaches of the Pechora River, and the Ob Bay are among the regions with the highest levels of contamination.

**Persistent organic pollutants** (POPs). There are no large sources of POPs contamination in the Russian Arctic. The existing local sources of POPs are as a rule associated with operational and retired electrical equipment, barrels containing used oils and other fuels and lubricants, stockpiles and haphazard stores of obsolete pesticides. Most of the POPs enter the region's environment as a result of long-range transport of atmospheric fluxes, rivers, and ocean currents originating in Asia, Europe, and North America. Because of their exceptional lipophilism, most chlororganic compounds accumulate in the fatty tissues of species in the food chain, such that the highest concentrations of pollutants are found in the subcutaneous fat and adipose tissues of animals at the upper levels of the food chain (for example, polar bears, seals, and whales). This causes particular alarm in the Arctic, because the local inhabitants consume a large amount of lipid-rich food products provided by hunting and fishing. In the Arctic Zone, the concentrations of POPs that are unhealthy for the indigenous population are the highest in the circumpolar Arctic.

**Radiation contamination.** The Russian Arctic, like all other world regions, has felt the impacts of global anthropogenic sources of radionuclides due to the development of nuclear energy. The main source of radiation contamination, which is having and will continue to have impacts for hundreds and thousands of years to come (as long-lived radionuclides decay), is the nuclear weapons testing carried out by the USA, USSR, China, United Kingdom, and France during the period 1945-90. The nuclear test site on the Novaia Zemlia archipelago saw 132 nuclear explosions with a total yield of 273 megatons. About 12 percent of the radioactive products of explosions on Novaia Zemlia were deposited near the test sites, 10 percent entered a concentric circumpolar ring at the latitude of Novaia Zemlia, and 78 percent went into the global "fund" of stratospheric radionuclides, from which further radioactive deposition has occurred. The Chernobyl accident in 1986 was an additional source of radionuclides entering the Arctic environment.

The ocean currents of the Gulf Stream system continue, though to a lesser degree than before, to transport radionuclides across borders from the West European nuclear facilities at Sellafield and Dounreay (United Kingdom) and La Hague (France).

The region also has large potential sources of radiation contamination-- namely, the naval and civilian nuclear fleet – which is spread along the entire northern shore of the Kola Peninsula and in the Severodvinsk region on the White Sea. The storage sites for spent nuclear fuel are a potential danger. Several containers with spent nuclear fuel were sunk in the bays off Novaya Zemlia. Other potentially dangerous sources of radiation are the Kola and Bilibino nuclear power plants. Radioisotopic thermo electric generators (RITEGs), which are used in navigation equipment, present a special problem when their service lives have expired. If handled improperly, they can present a lethal threat of irradiation. If they fall into the hands of terrorists, they can provide material for “dirty bombs.” At present, the inventorying and replacement of most RITEGs in the western part of the Arctic Zone has been completed, but they remain a problem in the Sakha Republic and Chukchi Autonomous Okrug.

## ***2.2 Biodiversity change and depletion of biological resources***

**Biodiversity change, and reduced populations and habitat loss of rare Arctic species** is a phenomenon of recent decades, when climate change and large-scale economic development have made the remote regions of the Arctic Zone more accessible and when pressures on biological resources have grown as the local population has become poorer and supplies to northern communities have been curtailed. Of special concern is the status of rare Arctic species, including red-listed species such as polar bear, Atlantic walrus, whales and other cetaceans, snow sheep, certain species and subspecies of whitefish and salmon, and waterfowl and shorebirds such as geese, brant, and waders.

**Uncontrolled utilization of biological resources and widespread poaching** are the highest-priority ecological problem, since they can lead to the loss of biodiversity in several regions of the Russian Arctic. It is linked to uncontrolled takes of oceanic and migratory fish and other seafood, as well as to the poaching of wild reindeer, fur-bearing mammals, and waterfowl. Reliable statistical data about this problem are lacking. There is reason to think that poaching in the Arctic is financially comparable to, or even larger than, legal hunting and fishing for the commercial and small-commodity market (seafood, salmon, caviar, velvet antlers and meat of wild reindeer, spring hunting for geese and brant, etc.). The poachers are primarily local residents who are isolated from the modern economy and have very low incomes. In the high Arctic, bird rookeries are subject to human impacts on individual islands and the mainland coast.

**The loss and human-caused alteration of ecosystems in the Arctic Zone** have long been confined to no more than 1-3 percent of the areas of the polar deserts and tundra. Now, with larger-scale development and increasing fragmentation of the soil and vegetative cover of the Arctic, the threat to biodiversity loss in ecosystems and the widespread alteration of ecosystems have become increasingly obvious. Clear examples are the forest ecosystems at their northern limit (Murmansk Oblast, Sakha Republic) and shrub ecosystems (Chukchi and Nenets Autonomous Okrugs), which have shrunk so much that their restoration is in doubt. The diversity and area of coastal, lowland, and delta ecosystems – meadows, thickets, and lowland forests and others -- have shrunk considerably in certain regions of the Arctic Zone. More and more degraded lands have been observed recently in the Nenets and Yamalo-Nenets Autonomous Okrugs. Large segments of fragmented ecosystems have formed in the lower reaches of the Pechora River in the Nenets Autonomous Okrug, around the city of Vorkuta in the Komi Republic, in the southern part of the Yamal Peninsula in the Yamalo-Nenets Autonomous Okrug, in the Norilsk industrial district, in northern Yakutia, and in the gold-mining districts of the Chukchi Autonomous Okrug. Parts of the eastern shore of Novaya Zemlya where nuclear tests were

conducted are among the areas affected.

**Inadequate geographic coverage and ineffective biodiversity protection** is characteristic of the specially protected natural territories of the Arctic Zone. There are practically no marine zapovedniki (preserves) in the region, and neither typical nor unique marine areas are under protection. Less than 50 percent of landscape diversity can be found in protected territories, and only 60-65 percent of terrestrial biodiversity (20-30 percent for plants, especially rare species, and 70-75 percent for fauna). The Russian Arctic now has 14 national zapovedniki as well as the federal zakaznik "Franz Josef Land," with a total area of more than 15 million hectares, all of which are Category 1 specially protected natural territories according to the International Union for the Conservation of Nature (IUCN) classification. The total area of northern, Arctic, and sub-Arctic specially protected natural territories is about 30 million hectares, which is on average about 5 percent of the territory of the Arctic Zone (3 percent of the Kola Peninsula, 5 percent of the Taimyr Peninsula, 8 percent of the Putoran area, and only 1.5 percent of the Kolyma upland). These are unevenly distributed, and there are only four current and several planned specially protected natural territories in eastern Siberia, although protected areas of different categories account for 20-40 percent of various regions of the Arctic abroad. Partially such considerable difference in comparison with other Arctic states will be compensated in the process of implementation of Resolution # 725-r of the Russian Government "On organization of state wildlife preserves and natural parks at the territory of the Russian Federation" dated May 23, 2001.

**Biological pollution, invasive species, and the introduction of exotic species** are and will be a high priority because of expanded economic activity and climate warming in the Arctic. Of concern are the spread of the Kamchatka crab and Far Eastern salmon species into the Atlantic sector of the Arctic and the broad northward expansion of many species of weedy plants and synanthropic animals, which settle primarily in industrial territories, where they form relatively stable natural-anthropogenic communities and drive out the native flora and fauna.

### ***2.3. Deteriorating living conditions of the indigenous population of the Arctic Zone and disruption of traditional nature use of indigenous small peoples***

**Deteriorating living conditions of the indigenous population**, such as poorer drinking water, have emerged as a high-priority problem because of the high levels of contamination at drinking water intakes, poorer air quality in populated areas, waste strewn about haphazardly, etc. Unacceptable drinking water quality has been noted in the Nenets and Yamalo-Nenets Autonomous Okrugs, where the concentration of petroleum hydrocarbons at water intakes reaches 10-35 MACs; and in Murmansk Oblast, where extraordinarily high levels of contamination are regularly found in water bodies due to wastewaters discharged from mining and metallurgical enterprises.

**Contamination of traditional food products** (by heavy metals, POPs, radionuclides, and others), which is carried long distances by high-altitude atmospheric flows, has affected almost all areas in the Arctic. Many organic pollutants are found at all levels of the food pyramid, and their long-term impacts are not fully known. The basic sources of pollution are global and regional transport of these contaminants. Global contamination is associated primarily with the Gulf Stream, the outflows of Siberian rivers, and atmospheric transport. Regional contamination is associated with the consequences of nuclear testing on Novaya

Zemlya in the atmosphere and in the sea, toxic emissions from non-ferrous metals plants and ore enrichment facilities (Kola and Taimyr peninsulas), the nuclear fleet and its coastal bases, the storage of military and industrial waste on the continental shelf, oil and gas extraction (Western Siberia and pre-Urals lowlands), and the pulp-and-paper and wood products industries (Arkhangelsk city, Koryazhma, Novodvinsk, Solombala). MACs are exceeded by tens of times over for almost all pollutants.

**Disruption of traditional nature use of the indigenous peoples**, as an environmental problem, stems not only from the taking of their lands for industrial uses but also from the subversion of the resource potential of the traditional economy of the indigenous peoples. Many northern rivers have lost their significance as fisheries because of pollution, the destruction of spawning areas, and poaching. The hunting grounds of the native peoples have been made accessible to newcomers by the development of transportation facilities and are taken for mining and industrial development. There are no effective government mechanisms to support the small businesses of the indigenous small nations. The legislative basis that governs the territories of traditional nature with limited economic activity is not sufficiently developed.

#### ***2.4. The adverse effects and threats of global climate change***

The warming which began in the second half of the 20<sup>th</sup> century has led to an increase in the average annual temperature in most regions of the Russian Arctic. The rising trend in air temperature (by 2.0-3.5°C by 2050 according to some scenarios) may lead to the disappearance and shrinkage of permafrost areas by 12-15 percent by the mid-21<sup>st</sup> century and may shift the southern permafrost boundary some 150-200 km to the north. According to modeling calculations, the depth of seasonal melting will increase by 15-25 percent on average, and up to 50 percent on the Arctic coast and individual areas of western Siberia. In addition to the direct impacts on economic infrastructure, this can also lead to a sharp increase in thermal erosion of shorelines and an acceleration of shoreline destruction (even now, 10 meters and more in certain regions).

The impacts of climate change on pollution of the Arctic environment, especially the seas, are direct and indirect. Direct impacts are associated with the physical and chemical processes that ultimately determine pollutant concentrations (changes in pollutant transport in the atmosphere and in the ocean, due to stronger cyclonic activity in the atmosphere, changes in the trajectories of ice drift and marine waters, increased contact time between air and water). Precipitation increases (by as much as 20 percent by the end of the century) will increase the volumes of atmospheric deposition, as will changes in the ratio of snow and rain, because snow and fog are more effective than liquid precipitation in releasing pollutants from the atmosphere. Increased precipitation will give ocean currents and ice a greater role in pollution transport. In addition, increases in river flows (by up to 20 percent) will increase the quantity of pollutants entering the Arctic Ocean. Conditions will be created for the retention of pollutants in Arctic lakes, owing to changes in the ice and hydrological cycles. Permafrost changes may lead to higher concentrations of organic substances in river flows, a more active circulation of mercury, and an increase in natural radioactivity. With the thawing of permafrost and glaciers, the pollutants accumulated for hundreds and thousands of years may begin to be released into the atmosphere and the ocean. This is especially true of DDT, heavy metals, and other substances. Furthermore, permafrost thawing leads to the release of greenhouse gases – carbon dioxide and methane – which in turn will intensify the greenhouse effect, accelerate climate warming, and upset the natural global equilibrium. Overall, one may expect a preponderance of adverse

consequences stemming from direct climate impacts on pollution of the Arctic.

The indirect consequences are linked to a heightened risk of environmental pollution caused by climate impacts on infrastructure and economic activity in the Arctic. More frequent and intense flooding, runoff, and inundations will increase the volumes of pollutants released into river and marine systems. The thawing of frozen ground and more active thermal erosion of shorelines will raise the likelihood of accidents at pipelines and other elements of the economic and social infrastructure, which together with the development of shipping, tourism, and oil and gas extraction will increase the risk of polluting new land and sea areas. The increase in storm activity will heighten the risk to shipping and activities on the continental shelf at the same time as risks are decreased as a result of reduced ice cover in Arctic seas. Possible changes in the way of life of the indigenous population due to changes in hunting conditions can alter nutritional patterns and pollutant impacts on humans.

In all, the development of Arctic infrastructure on land will increase the risks of climate-caused pollution. Pollution risks from marine activity will vary unevenly against the backdrop of warming. More favorable ice conditions will go hand in hand with some intensification of the wind and wave regime, especially in the western Arctic.

## ***2.5. Land degradation and land-use impairments***

Human-caused fragmentation of the soil and vegetative cover in the Arctic can be seen as one of the most important contemporary processes that cause the degradation of Arctic lands and can in the long run lead to irreversible environmental consequences. The most dangerous is the transition in the Russian Arctic from a development pattern characterized by isolated clusters linked by transportation ribbons to a pattern of more intensive development across a broad front.

Human-caused thermokarsts and thermal erosion at the current stage of development in the Arctic Zone are increasingly evident in industrial centers and along linear structures such as oil and gas pipelines, railways, highways, and power lines, where land takings are not carefully regulated and the standards incumbent in a special economic regime are not observed. The techniques for land restoration are ineffective in the Arctic, and regionally adapted schema for land restoration are lacking. Traditional restoration methods are used for about 50 percent of lands impaired by natural gas production, and 60-70 percent for lands impaired by oil production and ferrous metallurgy. The area of non-rehabilitated lands grows by 5,000-6,000 ha annually in the oil industry, 2,500-3,000 ha in the natural gas industry, and 400-500 ha under pipeline construction. In all, degraded land accounts for 1-3 percent of the total area of the mainland Arctic, but near the copper and nickel combines of Norilsk, Monchergorsk, and Pechenga, the soil cover is disturbed for a radius of dozens of km and natural landscapes are noticeably transformed.

Large pockets of degraded lands have been formed in forest-tundra and southern tundra areas as a result of logging and tundra and forest fires. Parts of the cut-over and burn areas have become waterlogged. Zonal vegetation in the Arctic restores itself much more slowly than in more southerly regions. The alteration of domestic reindeer pastures, which cover more than 334.7 million ha in all, has now reached as high as 63 percent.

## **Section 3. Goals, tasks, and principal activities of the SAP-Arctic**

The primary goal of the SAP-Arctic is to create the conditions necessary for taking actions to

prevent, reduce, and eliminate the consequences of human-caused pollution arising from activities on land and the continental shelf of the Arctic Zone down to levels that will ensure sustainable development while at the same time taking account of the interests of the human population, including the native small nations of the North.

The SAP-Arctic is a strategic framework document that sets the goals, tasks, and principal activities in the area of protecting the environment from pollution in the Arctic Zone and defines the fundamental mechanisms by which these goals will be realized. The high-priority goals and tasks for protection of the marine environment of the Arctic Zone from pollution are set forth for the period 2009-2012 and up to 2020, whereas initial measures are defined only for the period 2009-2012. These high-priority goals, tasks, and activities were developed while taking into account the causal chain analysis of environmental conditions in the Arctic Zone as well as consultations held at the federal and regional levels, sociological surveys of residents, and other sources.

The long-term goals of the SAP-Arctic for protection of the marine environment of the Arctic Zone from pollution are:

- 1. The prevention and abatement of pollution of the coastal and marine environments due to land-based and continental shelf-based activities, including oil, chemical, and radiation contamination;**
- 2. Improvement of surface water quality and groundwater quality in the coastal areas of the Arctic Zone;**
- 3. Preservation of biological and landscape diversity as well as the potential of renewable natural resources affected by human-caused pollution;**
- 4. Support for and preservation of favorable conditions for traditional nature use by indigenous small nations of the North;**
- 5. Reduction of natural and human-caused risks at economic and municipal facilities from global climate change.**

### ***3.1. Prevention and abatement of pollution in the coastal and marine environments by activities on the land and continental shelf, including oil, chemical, and radiation contamination***

#### **Indicators of long-term goal achievement**

- special environmental protection programs adopted by all RF constituent entities in the Arctic Zone, by 2012;
- reduce by 30 percent of the number of abandoned and sunken ships that interfere with navigation and cause pollution of the surrounding waters, and removal of sunken and scuttled ships, metal scrap, and solid waste from the coastal waters of Arctic seas and islands, by 2012;
- reduce stationary-source atmospheric emissions in the Arctic Zone by 9 percent by 2012 and by 20 percent by 2020;
- reduce the intensity of emissions of air pollution from 2.39 kg/1,000 rubles of GDP to 2.0 kg/1000 rubles by 2012 and to 1.5 kg/1,000 rubles by 2020;

- increase the volumes of associated natural gas utilized in oil-producing regions to 95 percent by 2015;
- identify and inventory illegal dumping of solid waste and create landfills sufficient to receive all newly generated waste by 2012;
- identify and inventory all sources of persistent organic pollutants in the Arctic Zone by 2012;
- identify, inventory, and provide for environmentally sound utilization of all abandoned RITEGs - in the Arctic Zone by 2012;
- increase the number of industrial enterprises in the Arctic Zone that have been ISO 14001 certified or its equivalent by 30 percent by 2012 and by 60 percent by 2020.

The basic tasks for prevention and removal of pollution of the coastal and marine environments of the Arctic Zone (Appendix 4) are:

3.1.1. At the federal and regional level, amend the legal and regulatory frameworks for control of petroleum, chemical, and radioactive contamination associated with activity on the land and continental shelf.

3.1.2. Extension of public-private partnership with participation by government institutions and the business community for the increase of efficiency optimal functioning of the environmental protection.

3.1.3. Reduce the impacts from hot spots on the environment in the Arctic Zone.

3.1.4. Develop strategies and regional response plans for oil spills in Arctic seas

3.1.5. Stimulate environmentally clean energy sources in the Arctic Zone

3.1.6. Eliminate past environmental damage on land and in the coastal zones of the Arctic seas.

3.1.7. Improve the monitoring system and the assessment of the state of anthropogenic pollution of Russia's Arctic seas.

3.1.8. Develop international environmental cooperation among the Arctic countries, including cooperation to strengthen control over transboundary transport in the Arctic.

3.1.9. Raise the level of environmental education and ensure public access to information about the condition of the environment in the Arctic Zone

3.1.10. Expand fundamental and applied scientific research on the main pollutants and their influence on man and the environment in the Arctic.

3.1.11. Create financial mechanisms for attracting investments to solve environmental problems.

### ***3.2. Improvement of surface and ground water quality in coastal areas of the Arctic Zone***

#### **Indicators of long-term goal achievement**

- reduce polluted and only partially treated wastewater as a percentage of all wastewater discharges post-treatment into surface water bodies from 52% to 44% percent by 2012 and

to 33% by 2020

- reduce standard values of polluted wastewater discharges into surface water bodies per unit of GDP from 1.4 to 1.2 kg/1,000 rubles of GDP by 2012 and to 1.0 kg/1,000 rubles of GDP by 2020;
- reduce the toxicity index in the most severely polluted regions of the Arctic coast by approximately 3-5% by 2012 and by 10-12% by 2020;
- increase the number of Arctic Zone residents who have permanent access to improved drinking water supply by 20% by 2012 and by 50% by 2020;
- increase investments in improving the condition of surface waters and groundwater used for drinking water by 30% by 2012 and by 50% by 2020;
- the number of degraded natural features that have been environmentally restored under a program for cleaning up water bodies
- increase the number of facilities that have wastewater treatment works by 15% by 2012 and by 50% by 2020;

The primary tasks for improving surface water and ground water quality, as well as drinking water supply, for residents of the Arctic Zone are:

- 3.2.1. Improve the water management system in the Arctic Zone;
- 3.2.2. Ensure environmentally sound utilization of liquid and solid wastes in areas adjacent to water intakes;
- 3.2.3. Introduce environmental technologies and facilities for the treatment of wastewater and storm water runoff and the utilization of contaminated sediments;
- 3.2.4. Create and develop water-protection zones and shoreline protection belts at water bodies;
- 3.2.5. Improve monitoring of the condition and quality of surface waters and groundwater.

### ***3.3. Conservation of biological and landscape diversity and the potential for renewable biological resources affected by human-caused pollution***

#### **Indicators of long-term goal achievement**

- increase by 2012 the area of coastal and marine protected natural territories on land and sea to 5% of the Arctic Zone area; and increase coverage of landscape diversity to 85% and biodiversity to 90% by 2012;
- expand the network of terrestrial protected natural territories in the Arctic Zone to 10% of the total area of the Arctic Zone in the framework of Resolution # 725-r of the Russian Government dated May 23, 2001 "On organization of state natural reserves and national parks at the territory of the Russian Federation in 2001-2010" by means of creation of national parks "Russian Arctic" (5.2 mln. hectares), "Onega maritime area" (0.3 mln hectares) and "Beringiya" (3.05 mln hectares)
- increase the financing of scientific research and monitoring on the condition of Arctic biota by 150% by 2012 and until 2020 (indexed for inflation);

- maintain populations of rare and endangered species of animals listed in the Red Book of Russia (polar bear, Atlantic walrus, and others) at the 2006-07 level; and in certain regions, restore (increase) the populations of salmon and whitefish species, waterfowl, shorebirds, raptors, wild reindeer, and others by 15-20% by 2012;
- create by 2012 regional nurseries for wild plants and seed stations for the supply of sowing and seeding materials for the restoration and rehabilitation of polluted and mechanically disturbed lands in the Nenets and Yamalo-Nenets Autonomous Okrugs.

Attainment of these targets is possible if the following activities are carried out:

- 3.3.1. Develop new legal and economic instruments for regulating biological resource use in the Arctic and improve the system of payments for biological resource use and the campaign against poaching;
- 3.3.2. Strengthen the system of land-based and marine protection of Arctic Zone biodiversity, with consideration for the effects of existing and future human-caused impacts;
- 3.3.3. Conduct scientific research on the biota and ecosystems of the Arctic, including research with international participation;
- 3.3.4. Improve the system for monitoring biodiversity and natural ecosystems in the Arctic, and include this system into the circumpolar network for monitoring flora and fauna;
- 3.3.5. Organize seed stations and nurseries for wild flora and fauna to support the work of ecological restoration and rehabilitation of disturbed land areas; and carry out re-introduction measures for restoration of populations of species that have gone extinct in certain regions.

### ***3.4. Support for and preservation of favorable conditions for traditional nature use by indigenous small-in-number peoples of the North***

#### **Indicators of long-term goal achievement**

- regional systems of indigenous environmental co-management in all Arctic regions by 2012;
- increase, by 50% by 2012, the total area of the territories of traditional nature use managed with participation of communities of the indigenous peoples of the North;
- increase, by 30% by 2012, the number of small and medium-sized businesses engaged in traditional nature use in the Arctic Zone;
- methodologies of qualitative evaluation of land, minimization and evaluation of damage caused by industrial use of lands of primordial living environment and traditional way of life of indigenous people, adopted to 2012.

Attainment of these targets is possible if the following activities are carried out:

- 3.4.1. Improve legislation for protection of the centuries-old way of life of the indigenous small peoples of the North, including changes in laws on traditional nature use territories;
- 3.4.2. Introduce instruments for comprehensive ecosystem management in areas with

compact settlements of indigenous small peoples of the North, including new legal, institutional and technological aspects;

3.4.3. Conduct scientific research and develop an action plan for adapting the traditional nature use of the indigenous nations of the North for entry into national and world markets, with predicted climate change taken into account.

### ***3.5. Reduction of climate change-related natural and technogenic risks at economic and social facilities***

#### **Indicators of long-term goal achievement**

- assessment report on climate change and its consequences in Russian Arctic, prepared to 2012;
- a national network for social and ecological monitoring of the settlements and communities of indigenous small peoples (provide resources for observation and communication at sites where the indigenous small peoples of the North live in compact settlements), for the purpose of assessing and preventing the adverse consequences of climate change, organized by 2012;
- proposals of the Russian Federation to the report of Senior Arctic Officials at the Ministerial meeting of the Arctic Council in 2011 in a part dealing with necessary activities on adaptation to the climate change

The following tasks are planned for attainment of this goal:

3.5.1. Create legal, regulatory, methodological, and organizational frameworks for the government's management of risk reduction of the adverse consequences of climate change for the natural environment, economy, and residents;

3.5.2. Expand fundamental and applied research on the effects of global climate change on the natural environment, economy, and humans in the Arctic Zone;

3.5.3. Reduce the risks and threats associated with transformation of natural ecosystems, and reduce the development of natural catastrophes in the Arctic Zone as the climate changes;

3.5.4. Develop scientific-technical and engineering documentation for the reduction of risks and threats stemming from adverse consequences for the economic infrastructure in the Arctic Zone;

3.5.5. Adapt traditional nature use by the indigenous peoples of the North to climate change; and reduce the risks and threats associated with the adverse consequences of climate change for residents of the Arctic Zone;

3.5.6. Improve the system for monitoring and predicting climate change, its consequences for the natural environment, economy, and residents;

3.5.7. Develop a system for training and education in the area of prevention and elimination of the adverse ecological consequences related to climate change in the Arctic Zone.

3.5.8. Proactive participation of the Russian Federation in the Arctic Council programs and other international global climate adaptation programs.

## **Section 4. Implementation of the Strategic Action Program**

### ***4.1. Political, Legal and Institutional Framework of SAP-Arctic***

#### **Political and Legal Framework**

SAP-Arctic is based on the provisions of strategies adopted by the Government of the Russian Federation such as: Marine Doctrine of the Russian Federation; Environmental Doctrine of the Russian Federation; Concept of the National Security of the Russian Federation; Concept of Transition of the Russian Federation to Sustainable Development; Concept of the Long-term Socioeconomic Development of the Russian Federation; Framework Arctic Policies of the Russian Federation until 2020, etc.

President of the Russian Federation approved Basic Principles of the State Policy of the Russian Federation in the Arctic until 2020 and further prospective, which defined the following goal of the state policy in a sphere of environmental safety - preservation and protection of Arctic environment, elimination of environmental consequences of economic activities in conditions of increasing economic activity and global climate changes.

To achieve this goal the following tasks are planned:

- provide conservation of biological diversity of Arctic flora and fauna including by means of extension of network of specially protected territories and sea areas taking into account national interests of the Russian Federation, necessity of preservation of natural environment in conditions of increasing economic activity and global climate changes;
- implement planned dismantling of ships with overage nuclear installations.

Main activities for implementation of state policy in the sphere of environmental safety are:

- establishment of special regimes of nature use and environmental protection in the Arctic zone of the Russian Federation, including monitoring of pollutions;
- reclamation of natural landscapes, elimination of toxic industrial wastes, providing of chemical security in a first turn in areas of compact settlement of population

Strategy and state program of socio-economic development of the Arctic zone of the Russian Federation will be developed for implementation of Basic Principles of the State Policy of the Russian Federation in the Arctic until 2020 and further prospective. Objectives, targets and activities envisaged in SAP-Arctic are to be fixed in these documents.

There is necessary legal and regulatory basis in the Russian Federation for providing the environmental safety. The federal law of the Russian Federation "On Environmental Protection" is the main law regulating protection of the Arctic nature, while the federal laws "On Internal Marine Waters, Territorial Sea, and Adjacent Zone of the Russian Federation", "On the Continental Shelf of the Russian Federation", "On Exclusive Economic Zone of the Russian Federation" regulate the protection and conservation of the marine environment. Of importance are provisions of the Law Code of the Russian Federation, Water Code of the Russian Federation, Forest Code of the Russian Federation, federal laws "On Subsoil", "On Protection of the Atmospheric Air", "On Protected Areas", "On Industrial Waste", as well as a substantial set of implementation legal acts. Subjects of the Russian Federation adopted regional legal acts to regulate environmental management and conservation such as regional laws, resolutions of the regional administrations, and legal acts of environmental authorities.

United Nations Convention on the Law of the Sea of 1982 provides to costal states legal

justification for protection and conservation of marine environment from pollution in the exclusive economic zone. According to the Clause 234 of the Convention coastal states have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone. On this basis the Russian Federation can introduce national rules in particular, for design, construction, equipment and vessel manning for shipping along Northern Sea Route.

The process of creation and forming of the system of legal regulation of shipping activities in the Arctic zone of the Russian Federation as independent part of the state policy due to special national interests in this region and regional features, is not completed due to contradictions in legal and regulatory acts. Federal entities of executive power should in accordance with the established procedure submit proposals on improvement of legislation on sea shipping activities in the Arctic to secure national interests of the Russian Federation in Northern Sea Route and centralized management of the transport system.

One precondition for the successful implementation of SAP-Arctic is the integration of environmental requirements into the national Arctic policy and development of the legal framework for the protection of the environment in the region. Given the geopolitical, economic, and environmental importance of the Russian Arctic, the focus should be on the policies and legislation initiatives at the federal level, and proactive participation of the Russian Federation in the international cooperation for the protection of the environment in the region.

The UNEP/GEF project “Russian Federation – Support for the National Plan of Action for Protection of the Arctic Marine Environment” includes a component “Development and implementation of Environmental Protection System (EPS)” which embodies analysis of environmental legislation and revisions and improvements in the legislative, regulatory and methodological documents directed at environmental safety in the Russian Arctic. It is also planned to develop proposals to environmental section of the strategy and state program of development of the Arctic zone of the Russian Federation until 2020. EPS component implementation will constitute the first stage of SAP-Arctic implementation.

There is a need in improving the federal and regional legal and regulatory frameworks for the purpose of preventing, responding to and managing oil, chemical, and radioactive pollution caused by on-shore and continental shelf activities. The legal framework for the protection of the Arctic natural complexes and population from pollution, unsustainable and unbalanced use of mineral, power and biological resources of the coastal zone and Arctic seas should be created.

## **International Cooperation**

SAP-Arctic will contribute to the implementation of Russia’s obligations and action plans of many intergovernmental environmental conventions, protocols and agreements including important conventions such as the United Nations Convention on the Law of the Sea, Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal, Stockholm Convention on Persistent Organic Pollutants, United Nations Framework Convention on Climate Change and the Kyoto Protocol, Convention on Long-Range Transboundary Air Pollution and Protocols Thereto, Convention on Biological Treatment, Convention on Wetlands, etc.

Along with other activities, the development of SAP-Arctic is part of the program for the participation of the Russian Federation in the preparation and implementation of the International Polar Year (2007/2008)

SAP-Arctic will benefit from the expansion of international cooperation with arctic and other countries concerned both within the framework of bilateral agreements and under the Council of the Barents Sea/Euro-Arctic Region, and Arctic Council including its six Working Groups: Protection of the Arctic Marine Environment (PAME), Arctic Monitoring and Assessment Program (AMAP), Arctic Contaminants Action Program (ACAP), Conservation of Arctic Flora and Fauna (CAFF), Emergency, Prevention, Preparedness and Response (EPPR), Sustainable Development Working Group (SDWG). SAP-Arctic activities will be Russia's contribution to the implementation GPA, implemented in the Arctic through RPA the Arctic Council Action Program for Combating Pollution in the Arctic.

SAP-Arctic will support initiatives of the organizations that enjoy the status of permanent members of the Arctic Council and represent interests of the indigenous peoples of the Arctic region including the Circumpolar Conference of the Inuits, International Association of Aleuts, Saami Council, Association of the Small-in-Number Indigenous Peoples of the North, Siberia and Far East of the Russian Federation, Arctic Council of Atabaskans, and International Council of Gvichins.

SAP-Arctic will also greatly benefit from cooperation with the international and non-governmental organizations participating in the Arctic Council as observers including: UNEP, UNEEC, UNDP, Council of Minister of Northern Countries, Nordic Environmental Financial Corporation (NEFCO), International Conservation Union, Parliamentarian Conference of the arctic region, Commission on Marine Mammals of the Northern Atlantic, International Federation of the Red Cross and Red Crescent Organizations, Northern Forum, World Wildlife Fund, International Arctic Scientific Committee, Advisory Committee for the Protection of the Seas, World Association of Reindeer-Breeders, Union for the Conservation of the Circumpolar Region, International Arctic Association of Social Sciences, International Union for Healthcare in the Circumpolar Region, Arctic University, International Working Group for Indigenous Peoples. Russia's participation in the implementation of the EU Northern Measurement Policy will provide new opportunities in addressing environmental issues.

## **Institutional Framework and SAP Coordination**

SAP-Arctic implementation is based on the principles of partnership and cooperation between governments, local governments, private sector, academic institutions and other organizations and associations including nongovernmental organizations and civil society organizations while recognizing the differences in the goals, functions and mandates of the stakeholders. Their representatives are members of the Interagency Working Group (IWG) established by the Russian Ministry of Economic Development and Trade to take into account the interests of all the parties participating in the implementation of the UNEP/GEF Project "Russian Federation – Support to the National Action Plan for the Protection of Arctic Marine Environment". Following the adoption of SAP-Arctic, the membership of IWG could be updated and expanded. SAP-Arctic will also clarify the IWG mandate concerning its role in the coordination and monitoring of the implementation of SAP-Arctic. IWG will play this role during Phase 2 of the UNEP/GEF Project since its overall objective will be to implement the goals and objectives of the SAP-Arctic.

Taking into consideration an international nature of SAP and involvement of many stakeholders, SAP-Arctic will establish a civil society based mechanism for the coordination and monitoring of SAP-Arctic, Public Council, involving recognized representatives of various nongovernmental organizations. Expediency of its formation will be considered at the round

table discussion with participation of all stakeholders, that will be conducted after endorsement of the SAP-Arctic in 2009 for presentation, discussion and assistance in implementation of the endorsed document.

In a case of establishment of the Public Council the functions of the Civil Society Council Secretariat could be delegated at the initial stage to the Project Office of the UNEP/GEF Project "Russian Federation – Support to the National Action Plan for the Protection of Arctic Marine Environment". The Secretariat will establish and support a Web-site to accumulate and disseminate information about the implementation of SAP-Arctic.

The SAP-Arctic activities will be implemented as part of the federal targeted programs, departmental targeted programs, programs initiated by the the Arctic regions, programs implemented by the private sector and nongovernmental organizations that are active in the Russian Arctic and subarctic areas, For the nearest future priority activities at the federal level are planned in the sub-program "Development and use of Arctic" of Federal Target-Oriented Programme (FTOP) 'World Ocean', adopted by Resolution of the Russian Government # 731 on September 30, 2008. Main objectives of this sub-program include elimination of damage associated with increased economic activity and rehabilitation of the environment in the Russian Arctic. To achieve these objectives the following activities should be performed:

- evaluation of environmental damage in the Arctic zone of the Russian Federation and justification of activities for its elimination and mitigation of threats to the environment due to extension of economic activity in Arctic;
- conduction of comprehensive studies for defining of list of priority investment projects, possible forms and mechanisms of their implementation;
- preparation of proposals on implementation of legal and institutional activities for elimination of consequences of industrial companies activities, which pollute the environment, and for preventive activities in the process of creation of new production complexes in Arctic;
- economic evaluation of activities on elimination of accumulated damage in areas of location of former military facilities passed on for the civil use, including territories on Franz-Josef archipelago and Novosibirsk islands;
- economic evaluation of activities on cleaning aquatic areas of seas and rivers from ownerless and sunken ships, which encumber shipping and create risks of environmental emergency situations, as well for cleaning aquatic areas of seas and rivers from hazardous substances;
- evaluation of threats of radioactive contamination of costal areas and aquatic areas of seas and rivers created by presence of outdated radioisotopic thermal electric generators, evaluation of expenditures for their dismantling and utilization in environmentally sound way;
- identification and elimination of sources of extremely hazard substances (outdated and banned dielectric fluids, pesticides, and other chemicals from a POPs group);
- evaluation of state of mercury containing wastes at the territory of the Russian Arctic and development of modern system of such waste management;
- development and testing of new methods of elimination of oil contamination and reclamation of oily polluted land in the Russian Arctic, including aquatic areas of seas and rivers, using modern biotechnologies;

- scientific justification of activities on rehabilitation of ecosystems of most acidified water bodies, which impose the threat to the public health, fish capacity and biodiversity of freshwater flora and fauna.

Priority activities on cleaning and remediation of arctic seas and costal areas will be also carried out, including removal of sunken objects, which encumber shipping, elimination of toxic wastes, for prevention and reducing of contamination of marine environment and costal territories from radioisotopes, oil products, heavy metals, other toxic substances. As a result of these activities amount of pollution sources in the Russian Arctic will be reduced.

It is obvious that tasks and activities listed above are correspondent to tasks and activities of the SAP-Arctic.

Basic Principles of the State Policy of the Russian Federation in the Arctic until 2020 and further prospective call for two extremely important documents: Strategy of development of the Arctic zone of the Russian Federation and State program of development of the Arctic zone of the Russian Federation until 2020. SAP-Arctic is to be a basis for formulation of objectives of environmental safety in Arctic.

Sectoral targeted programs will play a certain role in implementation of the SAP-Arctic. Such programs will be adopted by the head of a budget planning entity following the approval of it by the Russian Ministry of Economic Development and Trade and Russian Ministry of Finance. An example of such sectoral program, directly related to the implementation of the SAP-Arctic is the program of Ministry of Natural Resources and Environment of the Russian Federation on development of specially protected territories for 2007-2010.

SAP-Arctic will also be implemented through targeted programs of the regional and local levels. These are a set of activities initiated, developed, approved and implemented by the respective governments of the subjects of the Russian Federation in the mid-term and long-term perspective. Good examples of such regional targeted programs include programs such as: (i) the "Protection and Health of the Environment and Ensuring Environmental Safety in Murmansk Oblast for 2006-2008"; (ii) "Protection of the Environment in the Chukotsky Autonomous Okrug"; and (iii) "Ecology of the City of Archangelsk", etc.

Typical environmental objectives of the regional programs include:

**A. *Pollution Abatement and Emergency Prevention***

- Prioritizing the environmental and resource management policies of a subject of the Russian Federation in the Russian Arctic;
- Identifying and monitoring in an ongoing manner the critical zones; assessing the regional transboundary movement of pollutants; assessing the environmental status of the area and adverse impacts on the public health;
- Providing a cadastre-based assessment of the environmental status of the area and natural resources; identifying specific parameters of the environmental and resource management policies;
- Promoting investments into the reduction of pollution loads in a subject of the Russian Federation; identifying investment support tools and the respective implementation procedures;
- Identifying differentiated environmental standards for the territories and sea area in a subject of the Russian Federation;

- Introducing regulations for critical environmental zones, protected areas, zones with high environmental risks to the public health;
- Establishing an earmarked ecological fund; participating in the investment risks insurance system; encouraging the enterprises to introduce environmental management;
- Improving the system of the protected areas of regional importance with the purpose of conserving natural landscapes and recreation, developing recreational business.

***B. Upgrading and Modernizing Enterprises; Implementing Modern Value-Added Processing Technologies***

***C. Ensuring Uninterrupted Operation of Utilities and Housing Management***

- Introducing energy saving and efficient technologies;
- Improving the operation of utilities;
- Preventing potential environmental/technological emergencies.

The UNEP/GEF Project “Russian Federation – Support to the National Action Plan for the Protection of Arctic Marine Environment” will contribute to the establishment of the institutional framework and coordination mechanisms for the initial stage of SAP-Arctic. At this stage, the focus will be on the improvement of the legal and regulatory framework for the protection of environment in the Russian Arctic and on the preparation of environmental investment projects for 8 to 10 hot spots in the Russian Arctic. Throughout its entire life cycle, the UNEP/GEF Project will continue to operate the Interagency Working Group established by the Russian Ministry of Economic Development and Trade to integrate into SAP-Arctic the respective policies and activities carried out by the ministries and agencies concerned.

## **4.2. SAP-Arctic Financing**

### **Sources and Instruments of Financing**

One most important factor to ensure financial sustainability of SAP-Arctic is the improvement of the Russian budgetary system including the implementation of a three-year based budget planning and preparation for the disbursement of the Fund of Future Generations to capitalize the development institutions (the Bank of Development, Investment Fund, Russian Venture Company, State Corporation for Nanotechnologies, etc.). The use of mostly program methods of budget planning and shifting the focus from the “budget resources/expenditure management” to “performance-based management” by enhancing the responsibility and expanding the autonomy of the budget process actors and budget funds administrators within clear mid-term objectives generate enabling environment for a substantial increase in the funding of the environmental activities in the Russian Arctic. SAP-Arctic will greatly benefit from inter-budgetary transfers made from the Federal Compensation Fund, Federal Fund for Regional Development, and other federal funds for the financial support. The plan is to improve the methodology for the distribution of subventions to realize the mandate in the environmental management and protection with due regard to the environmental and socioeconomic features of the subjects of the Russian Federation related to the Russian Arctic.

Regional authorities will take into account the territorial specifics of the investment process and formulation of sound investment policies given their mandate for the management of budget resources. The instrument to promote domestic and foreign investments to

implement the priority projects including environmental projects are as follows:

- Providing temporary full or partial exemption from paying taxes to the budgets of subjects of the Russian Federation;
- Tax deferment of payments (or payment in installments) to the regional budgets;
- Providing investment tax credits;
- Budgetary inputs into investment projects;
- Preparing documents and conducting expert reviews of investment projects from the budgetary funds;
- Providing investors with guarantees and warranties of regional administrations;
- Giving enterprises the right to use part of the pollution charges (offsetting);
- Providing companies with soft rates for leasing land and property owned by the subject of the Russian Federation;
- Assisting in the establishment of business infrastructure, obtaining lease and purchasing land parcels and non-residential premises owned by the subject of the Russian Federation.

## **Developing Financial Mechanisms**

The substantial increases in the amount and quality of financing the pollution abatement activities in the Arctic will be achieved by forming and improving partnerships between the governments of all levels, private sector and civil society including by development PPP mechanisms. Given the regional (for the entire Arctic area) and global importance of SAP-Arctic, these activities will be implemented by involving the countries and international financial organizations concerned.

Annex 5 provides a general description of potential financial instruments and mechanisms to support SAP-Arctic. The expert review showed that nearly all the PPP new mechanisms and instruments have a high potential for SAP-Arctic support.

For instance, establishing special economic zones for ports and tourism/recreation may well be one of the important mechanisms for the conservation of both the biological/landscape diversity and support to the traditional nature use by small-in-numbers indigenous peoples of the North. The basic conditions for the establishment of special economic zones and mechanisms of government support to this activity should be adapted to the Russian Arctic.

The years of 2008-2009 will see a great focus on the improvement of the nature resources use payment system by expanding the basis of the technological pollution charges and improving and streamlining the system of pollution charges.

To mobilize financial resources of domestic manufacturing enterprises of all ownership types and of international investors (Arctic countries, banks international financial organizations) and to tap new financial sources and instruments, an international partnership conference and a number of round tables in the subjects of Russian Federation will be conducted in 2008-2010.

A promising option of financing SAP-Arctic is attracting funds from the international carbon market including the use of Kyoto Protocol mechanisms of flexibility such as JI projects and trading in GHG emission rights. SAP-Arctic will create a special mechanism to finance energy saving and other environmental projects in the Russian Arctic under the scheme of targeted environmental investments, which is being developed by the Government of the

Russian Federation with the support of the World Bank. Given the special global importance of the Arctic, the probability is high that countries – potential buyers of part of the Russian quota for the GHG emissions – will agree to send part of the proceeds from the sale of the quota to support the pollution abatement activities in the Arctic.

Another proposal is to establish a special budgetary Climate Change Adaptation Fund (which will be similar to the Kyoto Protocol Adaptation Fund) by paying part (2-3%) of proceeds from the sale of Emission Reduction Units under JI activities. Given particular sensitivity of the Arctic nature to climate change, financing adaptation activities in the Arctic could be the biggest priority of this fund. Implementing the concept of the Adaptation Fund requires a draft law and its adoption by the ministries and agencies concerned.

### **4.3. Monitoring and Adjusting SAP-Arctic Implementation**

SAP-Arctic implementation will be controlled as in federal, regional, sectoral and corporate programs which implement activities of the SAP-Arctic. Subprogram “Development and Use of the Arctic” of the Federal Targeted Program “World Ocean” will be monitored by the Russian Ministry of Economic Development and governmental sponsors of the activities on the basis of the Subprogram indicators and targets.

The Interagency Working Group, created by Ministry of Economic Development of the Russian Federation for coordination of interests of Russian participants of UNEP/GEF project “Russian Federation – Support to the National Programme of Action for the Protection of the Arctic Marine Environment”, will monitor SAP-Arctic implementation on the basis of the SAP-Arctic indicators and targets. Assessment will be based on the following information sources:

- Reports prepared by sponsors and contractors of the activities;
- Data of the monitoring and state statistical reporting;
- Information of the federal and regional authorities, municipal self-governments and companies operating in the Russian Arctic;
- Consultations with the stakeholders;
- Independent expert reviews, research and studies, outputs of conferences and meetings, and other sources.

The SAP-Arctic preparation involved wide-ranged consultations with representatives of expert, scientific, and business community, as well as with the federal and regional authorities in order to identify priority issues and formulate the environmental quality goals (EQG). These consultations resulted in the goals and objectives to help attain EQG.

Public monitoring of SAP-Arctic implementation will be through the Civil Society Council. Proactive participation of the civil society groups and parties in achieving the goals of SAP-Arctic at the federal, regional, and local levels is key to its successful implementation. It is important to ensure that the stakeholders both take proactive part in the implementation of the Program activities and generate proposal for its further development and expansion. SAP-Arctic is a live document that may and should be changed depending on the progress and externalities. Upon the completion of the first stage of SAP-Arctic implementation in 2010, the Program will carry out a detailed review of the Program progress and carry out the second Stakeholder Forum to introduce the required adjustments.

## Annex 1. Qualitative Assessment and Priority Ranking of Environmental Issues

The integrated matrix for the assessment of priorities of environmental issues in the Russian Arctic; consequences: 1 – past accumulated; 2 – current; 3 – future, forecasted; assessment of the consequences (scores): 0 – not visible; 1 – visible damage; 2 – considerable damage; 3 – catastrophic damage.

Environmental issues groups and the scores (point score)	Consequences for nature			Consequences for economy			Consequences for population			Transboundary consequences		
	1	2	3	1	2	3	1	2	3	1	2	3
<b>Negative consequences and risks of climate change (total - 52)</b>	0	1	1	1	1	2	1	1	3	0	1	2
<b>Permafrost transformation (thawing, coast erosion, etc.), conditions of biota habitat, ecosystems, biological resources (18)</b>	0	1	2	1	2	3	1	2	3	0	1	2
<b>Degradation and low adaptive capacity of the economy and existing business infrastructure (19)</b>	0	1	2	1	2	3	1	2	3	0	1	3
<b>Destruction of utilities, social infrastructure, increased morbidity of the indigenous and alien population (15)</b>	0	0	1	1	2	3	1	2	3	0	1	1
<b>Environmental pollution (total - 105)</b>	1	2	3	1	2	3	2	3	3	2	2	3
<b>Transboundary air and water transport of pollutants (26)</b>	2	2	3	1	2	2	1	2	3	2	3	3
<b>Oil pollution caused by extraction, transportation, and emergencies at transport, etc. (22)</b>	1	1	3	1	2	3	1	1	3	1	2	3
<b>Chemical pollution of natural environments including with PACS, POP, heavy metals, etc. (23)</b>	1	2	3	1	1	2	2	2	3	1	2	3

<b>Pollution with radionuclides (16)</b>	1	1	2	0	1	1	1	2	2	1	2	2
<b>Accumulation of solid waste (18)</b>	1	2	2	1	1	2	1	3	3	0	1	1
<b>Degradation of lands and non-compliance with land management rules (total - 34)</b>	1	2	3	1	1	2	1	1	2	0	1	1
<b>Fragmentation of soil and vegetation cover (13)</b>	1	2	3	0	1	2	0	1	2	0	0	1
Degradation of lands, increased thermocarst and temperature erosion (12)	1	1	1	1	2	2	0	1	2	0	0	1
Transformation of reindeer pastures (9)	1	2	2	0	0	1	0	1	1	0	0	1
Changes in biodiversity, ecosystems and bioresources (total - 103)	2	2	3	1	1	2	1	2	3	1	2	3
Loss and man-induced transformation of ecosystems (18)	1	2	3	1	1	2	1	1	2	0	1	3
Reduced biodiversity, reduced number and transformation of habitats of rare species (19)	1	2	3	1	1	2	1	2	2	0	1	3
Nonregulated use of biological resources and poaching (32)	2	3	3	2	3	3	2	3	3	2	3	3
Spontaneous biotic invasions and deliberate introduction of alien species (15)	0	1	2	0	1	2	0	1	2	1	2	3
Low efficiency and representation of the area-based conservation of biodiversity (19)	1	2	3	1	1	2	0	1	2	1	2	3
Conservation of enabling environment (total - 66)	0	1	1	1	2	3	2	3	3	0	1	2

Degradation of housing, utilities, including water utilities (17)	0	0	1	1	2	3	2	3	3	0	1	1
Violation of conditions of traditional nature use of indigenous peoples (23)	1	2	2	1	2	2	2	2	3	1	2	3
Reduced resource potential of traditional economy of indigenous peoples (26)	1	2	3	1	2	3	2	3	3	1	2	3

## **Annex 2. Causal Chain Analysis of Priority Environmental Problems**

The causal-chain analysis (CCA) aimed at reviewing the cause and effect links of environmental problems is a key stage in the development of a systemic practical approach to addressing the transboundary waters issues. CCA aims to identify the most important environmental and socioeconomic factors, as well as consequences followed by the elaboration of the corresponding policies for the compensation of damage or mitigation of adverse impacts. The CCA developed was based on the GIWA (Global International Waters Assessment Project<sup>1</sup>) assessment methodology.

The CCA is based on the review of the critical causes of those activities and decisions that have an impact on water and associated resources. The CCA conceptual model addresses the hierarchy of the causes that gave rise to a certain environmental problem. The SAP-Arctic CCA included four main stages: (i) identifying environmental, socioeconomic and transboundary impacts; (ii) identifying direct, sectoral and critical causes of problems; (iii) analyzing the interaction of these factors; and (iv) formulating policy recommendations/decisions to reduce or eliminate negative impacts on the international waters.

The stage of quantitative assessment and environmental problems ranking (Annex 2) reviewed environmental impacts and socioeconomic consequences. The transboundary impacts were reviewed in a separate way. The CCA overall goal was to link the environmental issues so identified and their consequences with the direct (visible), sectoral and critical causes of problems (Figure 1).

In CCA, the direct (visible) causes mean physical, chemical or biological factors occurring in the form of a certain environmental problem. For instance, in case of POP contamination, direct causes included electric equipment, abandoned pesticides storage facilities, wild fires, emissions from the burned garbage, transboundary movement of air pollutants from Asia, Europe, and North America, etc.

Sectoral causes included the activities in various sectors that gave rise to the occurrence of a direct causes and/or some systemic violation in the socioeconomic sector. For POP, these include lack of any modern technologies for PCB destruction, illegal imports and exports of pesticides, lack of adequate control at the pesticide storage, inadequate monitoring systems, etc.

The common nature of critical causes for all the environmental problems identified is because these are universal representing such key factors, processes or institutions that affect the overall environmental situation, impact, or decision. Generally, critical causes include systemic violations and factors. For SAP-Arctic these included low efficiency or lack of a federal/regional policy and strategic planning of the Russian Arctic development, non-compliance with the environmental legislation and regulations, inadequate circumpolar monitoring system and scientific assessment of the impacts caused by global climate changes on the Arctic environment, etc.

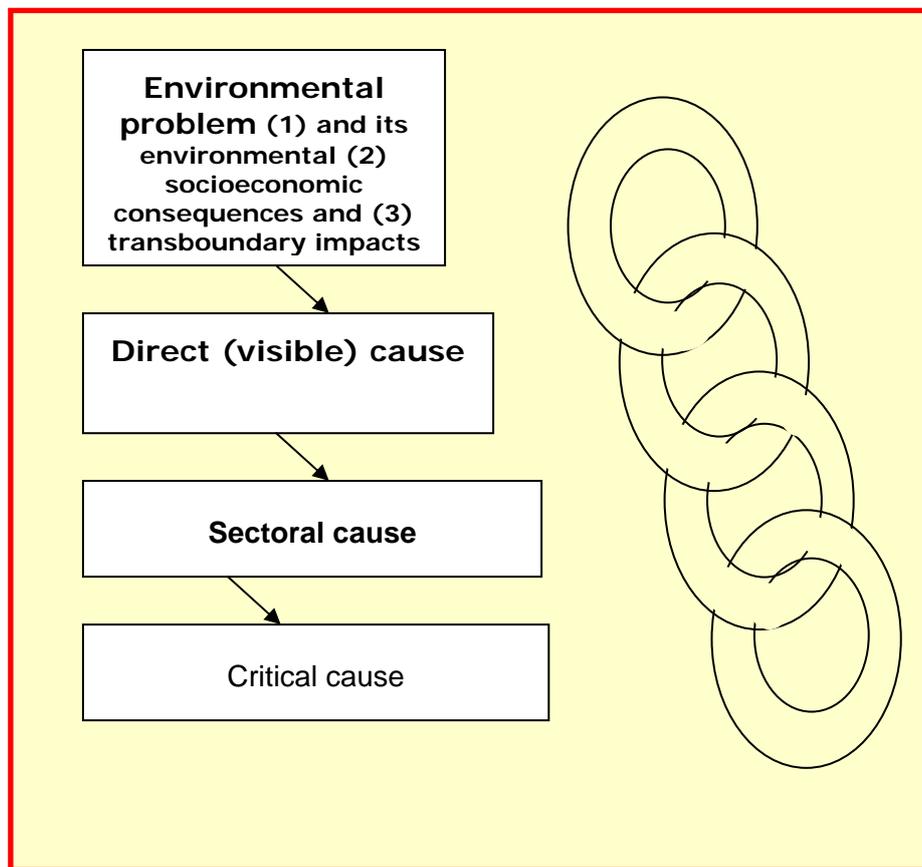
In total, the two-stage analysis of the five environmental problems identified including the quantitative assessment and prioritization of the environmental problems (Annex 2) and CCA (Annex 3) lead to the formulation of the five long-term goals of SAP-Arctic for the

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<sup>1</sup> Global International Waters Assessment - <http://www.giwa.net/>

protection of the marine environment in the Russian Arctic from pollution and propose a systemic package of measures (recommendations) to attain these goals (Annex 4).

Figure 1. CCA Conceptual Diagram



### Annex 3. Ranked List of Priority Hot Spots in the Russian Arctic

Hot spots	Current impact	Potential impact
NORILSK	38.0	42.0
NICKEL	37.2	41.2
ZAPOLIARNY	37.2	41.2
MONCHEGORSK	31.4	34.4
KAYERKAN	31.0	33.0
VORKUTA	30.4	34.4
MURMANSK	29.2	32.2
TALNAH	27.8	29.8
<i>KOLA BAY</i>	<i>26.8</i>	<i>28.8</i>
ARCHANGELSK	26.2	29.2
PEVEK	26.2	28.2
BILIBINSKY COMPLEX	25.8	27.8
<i>DVINA BAY</i>	<i>25.8</i>	<i>27.8</i>
ANADYR	25.4	27.4
KIROVSK	25.4	27.4
<i>KANDALAKSHA BAY</i>	<i>25.4</i>	<i>27.4</i>
<i>ONEGA BAY</i>	<i>25.4</i>	<i>27.4</i>
<i>OB' BAY</i>	<i>25.2</i>	<i>27.2</i>
<i>ENISEI BAY</i>	<i>25.2</i>	<i>27.2</i>
<i>PECHORA BAY</i>	<i>24.4</i>	<i>26.4</i>
OLENEGORSK	24.4	26.4
KOLA	24.2	25.2
URENGOI DEPOSIT	24.0	26.0
KANDALAKSHA	23.8	25.8
SOLOMBALA	23.8	25.8
KORIAZHMA	23.8	25.8
DUDINKA	23.8	25.8
SEVERODVINSK	23.6	25.6
YAMBURG DEPOSIT	23.4	25.4
INTA	23.2	25.2

Yellow color: Western Arctic;

Green color: Central Arctic;

Blue color: Eastern Arctic;

Italics: marine waters

## **Annex 4. Goals, Objectives, Activities and Change Indicators in SAP-Arctic**

### **Long-Term Objective # 1. Prevention and abatement of pollution of the coastal and marine environments due to land-based and continental shelf-based activities, including oil, chemical, and radiation contamination**

#### **Indicators of long-term goal achievement:**

- special environmental protection programs adopted by all RF constituent entities in the Arctic Zone, by 2012;
- reduce by 30 percent of the number of abandoned and sunken ships that interfere with navigation and cause pollution of the surrounding waters, and removal of sunken and scuttled ships, metal scrap, and solid waste from the coastal waters of Arctic seas and islands, by 2012;
- reduce stationary-source atmospheric emissions in the Arctic Zone by 9 percent by 2012 and by 20 percent by 2020;
- reduce the intensity of emissions of air pollution from 2.39 kg/1,000 rubles of GDP to 2.0 kg/1000 rubles by 2012 and to 1.5 kg/1,000 rubles by 2020;
- increase the volumes of associated natural gas utilized in oil-producing regions to 95 percent by 2015;
- identify and inventory illegal dumping of solid waste and create landfills sufficient to receive all newly generated waste by 2012;
- identify and inventory all sources of persistent organic pollutants in the Arctic Zone by 2012;
- identify, inventory, and provide for environmentally sound utilization of all abandoned RITEGs - in the Arctic Zone by 2012;
- increase the number of industrial enterprises in the Arctic Zone that have been ISO 14001 certified or its equivalent by 30 percent by 2012 and by 60 percent by 2020.

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
1.1. Improvement at the federal and regional level of legal and regulatory frameworks for control of petroleum, chemical, and radioactive contamination associated with activity on the land and continental shelf	1.1.1. Preparing proposals to the Environmental Sections of Strategy and State Program of socio-economic development of the Arctic zone of the Russian Federation in the Arctic till 2020	1.1.1. Environmental Sections in the Strategy and State Program	PI	2009-2010
	1.1.2. Preparing proposals to the adoption of the regulatory legal act approving the Russian Arctic boundaries	1.1.2. Draft regulatory legal act	PI	2009
	1.1.3. Preparing proposals to the adjustment of the federal laws with the aim of strengthening environmental protection in the Arctic and improving economic sanctions for failure to comply with the environmental standards and requirements.	1.1.3. Proposals to the adjustment of the federal laws	PI	2009-2010
	1.1.4. Preparing proposals to the adjustment of the existing or development of new general and special technical regulations setting the limits, standards, and rules applicable to a variety of environmental activities in the Russian Arctic with due regard to the specifics of its environments and climate change	1.1.4. Technical regulations setting the limits, standards, and rules for environmental activities in the Arctic	PI	2008-2012

<sup>2</sup> PI process indicator; SRI – stress reduction indicator; ESI – environmental status indicator

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
	1.1.5. Preparation of analytical materials and a draft of the report to the Government of the Russian Federation on necessity of improvement of Russian environmental legislation for providing of environmental safety in the Arctic zone of the Russian federation 1.1.6. Preparation of proposals to the draft of federal law "On amendments into the Law # 1422-XI of USSR dated November 28, 1984 "On approval of Decree of the Supreme Soviet of the USSR "On strengthening of nature protection in regions of the Extreme North and marine areas adjacent to the northern sea coast of the USSR", with explanatory note and financial and economic substantiation	1.5.1. Analytical materials and a draft report  1.1.6. Proposals to the draft federal law	PI  PI	2009  2009
1.2. Extension of public-private partnership with participation by government institutions and the business community for the increase of efficiency optimal functioning of the environmental protection	1.2.1. Implementing the mechanisms of leasing out buildings, structures, production equipment at the facilities offering environmental services in the Russian Arctic (solid waste dumps, sludge lagoons, etc.)	1.2.1. Number of lease contracts made	PI	2009-2012
	1.2.2. Creation of conditions for expansion of PPP in infrastructure projects in the Russian Arctic	1.2.2. Number of projects in the Russian Arctic implemented as PPP	PI	2009-2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
1.3. Reduce the impacts from hot spots on the environment in the Arctic Zone	1.3.1. Developing and implementing regional programs for cleaning up water bodies, coastal marine areas, marine coasts from sunken ship, abandoned large-sized property and garbage;	1.3.1. Number of disturbed natural features that were cleaned up under the water bodies clean up program	ESI	2009 – 2020
	1.3.2. Ensuring environmentally safe exploitation of natural resources at the oil and gas industries, accident free operation, control and prompt response to emergencies (under corporate programs)	1.3.2.1. Reductions in the associated gas emissions (methane) 1.3.2.2 Reductions in emergency oil spills	SRI SRI	2009 – 2020 2009 – 2020
	1.3.3. Upgrading production processes, implementing air and water protection activities at pump and paper works(under corporate programs)	1.3.3.1. Reduced emissions to air 1.3.3.2 Reduced discharged of pollutants to water bodies	SRI SRI	2009-2020
	1.3.4. Developing and implementing corporate programs for safe handling of radioactive waste and used nuclear fuels; carrying out activities to prevent the risk of polluting the environment with radioactive substances at the facilities (in the course of implementation)	1.3.4. Reduced risk of polluting the environment with radioactive substances	SRI	2009-2015
	1.3.5. Developing territorial and municipal programs for the establishment of solid waste collection and disposal systems	11.3.5. Reduced number of communities with lacking solid waste dumps and solid waste disposal systems	SRI	2009-2015
1.4. Develop strategies and regional response plans for oil spills in Arctic seas	1.4.1. Developing the basic format of Comprehensive Response Plans for Oil Spills at the off-shore oil fields with the details of the modern technologies and procedures	1.4.1. Revisited corporate oil spill response plans	PI	2009-2012
	1.4.2. Developing Rules for Safe Transportation of Oil and Oil Products in the ice covered Arctic seas	1.4.2. System and regulation for environmentally safe transportation of oil and oil products in the Arctic seas	PI	2008-2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
	1.4.3. Developing oil clean up action plans for the rivers falling into the Arctic seas (Northern Dvina, Pechora, Yenisei, Lena, Ob', etc.), with major sources of chemical and oil contamination located on their banks	1.4.3.1. Oil clean up action plans for the rivers falling into the Arctic seas 1.4.3.2 Response plans for environmental emergencies caused by industrial accidents at the facilities located on the coastal zone, at the coast, islands, estuaries, etc.	PI	2009-2012
1.5. Stimulate environmentally clean energy sources in the Arctic Zone	1.5. Preparing the list of priority demonstration projects for the renewable energy sources development recommended to implementation	1.5. List of priority demonstration projects for the renewable energy sources development	PI	2009-2010
1.6. Elimination of past environmental liabilities on land and coastal zones of the Arctic seas	1.6.1. Preparing the list of priority investment projects on elimination of past environmental liabilities	1.6.1. List of priority investment environmental projects indicating their technical and economic parameters	PI	2009 - 2010
	1.6.2. Reducing mercury contamination in the Arctic	1.6.2.1. Registry of mercury containing waste in the Russian Arctic 1.6.2.2. Number of mobile units to carry out preliminary recovery of mercury-containing waste in the remote areas	PI SRI	2009-2012
	1.6.3. Developing and testing biotechnological reclamation of areas polluted with oil	1.6.3.1. Approved clean-up methodologies for oil-polluted land areas 1.6.3.2. Number and scope of demonstration projects for the reclamation of oil-polluted areas of the Russian Arctic	PI SRI	2009 - 2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
	1.6.4. Clean-up of the Kola Bay marine area and adjacent land area from the abandoned vessels and metal structures (over 180 registered items).	1.6.4. Cleaned-up of the Kola Bay marine area and adjacent land area.	SRI/E SI	2009 - 2012
	1.6.5. Clean-up of the area along the Northern Sea Route from obsolete RITEGs and their utilization	1.6.5. Reducing the number of abandoned and obsolete RITEGs that are in a bad state of repairs (from 283 down to 30)	SRI	2009-2012
	1.6.6. Remediation of territories of abandoned polar station, hydrometheological posts and military bases on islands	1.6.6. Cleaned-up territories of islands	SRI/E SI	2009 - 2012
	1.6.7. Disposing of obsolete and banned dielectric liquids and pesticides from POP category	1.6.7. Amount of utilized neutralized hazardous substances	SRI/E SI	2009-2020
	1.6.8. Establishing the federal and regional databases for past environmental damage	1.6.8.1. Consolidated databases for past environmental damage sites and data on high priority projects prepared by making use of this database 1.6.8.2. Methodologies for the calculation of environmental damage as applicable to impacted areas and hot spots of the Russian Arctic	PI	2009-2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
1.7. Improve the monitoring system and the assessment of the state of anthropogenic pollution of Russia's Arctic seas, strengthen monitoring of trans-boundary transfer	1.7.1. Developing a set of environmental quality objectives and indicators for the Arctic and methodologies for the incorporation of these indicators and objectives in the environmental charges	1.7.1.1. Regulation on the System of Environmental Quality Objectives and Indicators for the Arctic 1.7.1.2. Methodology for the incorporation of these indicators and objectives in the environmental charges	PI	2009 – 2012  2009-2020
	1.7.2. Developing the State System of Environmental Monitoring	1.7.2.1. State system of environmental monitoring Environmental Observation 1.7.2.2. Upgraded network of observation platforms for monitoring the marine environment and coastal zones on the basis of the requirements to the control over the trans-boundary movement of pollutants 1.7.2.3. The program of integrated environmental monitoring in the area of hydrocarbon fields on the Western Arctic shelf zone	PI	
	1.7.3. Establishing publicly accessible information databases on the environmental status of the Arctic by making use of GIS technologies 1.7.4. Conducting strategic environmental assessment (SEA) of Russian Arctic development programs	1.7.3. Publicly accessible information databases on the environmental status of the Arctic 1.7.4. SEA for development programs	PI	2009 - 2020

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
	1.7.5. Development of regional standards for oil products and other hazardous materials content in soils, grounds and water taking into account regional features	1.7.5. Regional standards	PI, ESI	2009-2012
1.8. Development of international environmental cooperation among the Arctic countries, including cooperation to strengthen control over trans-boundary transport in the Arctic	1.8.1. Developing an international program for the integrated management of the Arctic coastal zone with the participation of the Arctic states (as per the Arctic Council program)	1.8.1. Program for the integrated management of the coastal zone	PI	2009-2012
	1.8.2. Organizing permanent workshops (working consultations) to ensure exchange of environmental experiences between the Arctic states including within the framework of the Arctic Council	1.8.2. Workshops and publications on the following themes: <ul style="list-style-type: none"> <li>- climate change adaptation;</li> <li>- ecosystems of the ocean, coastal zones of the seas and protection of the marine environment from pollution;</li> <li>- marine sciences to inform coastal zone integrated management;</li> <li>- conservation of the environments for the small-in-numbers indigenous peoples of the North, etc.</li> </ul>	PI	2009-2020
	1.8.3. Expanding involvement of the Russian Federation in the working groups of the Arctic Council	1.8.3.1. Incorporating elements of SAP-Arctic into the new version of the Arctic Councils Regional Action Plan;	PI	2009 - 2009
				2009 - 2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
		1.8.3.2. New environmental project initiatives of the Russian Federation within working groups of PAME, AMAP, ACAP, CAFF, EPPR, Arctic Council		
1.9. Raise the level of environmental education and ensure public access to information about the condition of the environment in the Arctic Zone	1.9.1. Environmental training for the regional and local authorities of the Russian Arctic focusing on the need to assess environmental costs and benefits of proposed projects	1.9.1.1. Developed and implemented training programs for the oblast and local authorities concerning environmental status of the Arctic 1.9.1.2. Including environmental problems of the Arctic in the curricular of the educational establishments 1.9.1.3. Support to the operating environmental Web resources	PI	2009-2012

Target	Action	Indicator	Indicator type <sup>2</sup>	Time-frame
1.10. Expand fundamental and applied scientific research on the main pollutants and their influence on man and the environment in the Arctic	1.10.1. Developing and implementing the programs of fundamental and applied scientific research in the Arctic on: <ul style="list-style-type: none"> <li>• transformation of permafrost processes, erosion of the banks and shores of the rivers, lakes and seas; status of the ecosystems, etc.;</li> <li>• changes in the pollution status of the Arctic seas and coastal zone due to the development of the economic activities in the Russian Arctic and adjacent areas;</li> <li>• environmental protection in the open seas and deep water areas;</li> <li>• developing green sources of energy;</li> <li>• creating effective methods of cleaning-up oil pollution in the ice-covered marine environment;</li> <li>• studying the impact of pollution on human health and ecosystems in the Arctic;</li> <li>• substantiating the need in the use of biotechnologies to prevent marine pollution with oil, radioactive substances, heavy metals;</li> </ul>	1.10.1. Number of funded and implemented programs of fundamental and applied scientific research in the Arctic	PI	2009-2020
1.11. Create financial mechanisms for attracting investments to solve environmental problems	1.11.1. Developing mechanisms for long-term co-sharing financing of investment projects addressing environmental problems in the Russian Arctic	1.11.1. Regulatory legal act on the mechanisms of concessional financing of projects addressing environmental problems in the Russian Arctic	PI	2010 - 2012
	1.11.2. Developing a regulation on the environment rehabilitation charges for the impacted areas and hot spots in the Russian Arctic	1.11.2. Regulatory legal act	PI	2010 - 2012

## **Long-Term Objective #2. Improvement of surface and ground water quality in coastal areas of the Arctic Zone**

### **Indicators of long-term goal achievement**

- reduce polluted and only partially treated wastewater as a percentage of all wastewater discharges post-treatment into surface water bodies from 52% to 44% percent by 2012 and to 33% by 2020
- reduce standard values of polluted wastewater discharges into surface water bodies per unit of GDP from 1.4 to 1.2 kg/1,000 rubles of GDP by 2012 and to 1.0 kg/1,000 rubles of GDP by 2020;
- reduce the toxicity index in the most severely polluted regions of the Arctic coast by approximately 3-5% by 2012 and by 10-12% by 2020;
- increase the number of Arctic Zone residents who have permanent access to improved drinking water supply by 20% by 2012 and by 50% by 2020;
- increase investments in improving the condition of surface waters and groundwater used for drinking waster by 30% by 2012 and by 50% by 2020;
- the number of degraded natural features that have been environmentally restored under a program for cleaning up water bodies
- increase the number of facilities that have wastewater treatment works by 15% by 2012 and by 50% by 2020;

Target	Actions	Indicators	Indicator type	Time-frame	
2.1. Improve the water management system in the Arctic Zone	2.1.1. Updating the water resources assessment plans and territorial targeted programs to reflect measures for the sanitation of water bodies used as water supply sources	2.1.1.1. water resources assessment plans	PI	2009-2010	
		2.1.1.2. Action plans to improve water supply quality as part of the targeted programs of territorial development	PI	2009-2010	
	2.1.2. Converting water supply systems to well water supply in the areas with poor quality of surface waters while conducting surveys to assess the status and quality of underground waters and using them to establish reserve sources of water supply for settlements in the Arctic	2.1.2.1. Registry of settlements in the Arctic with poor quality of water supply sources	SRI	2009-2010	
		2.1.2.2. Increasing the share of underground drinking water supply	SRI	2009-2020	
	2.1.3. Rendering government support to projects for the sanitation of water bodies used as water supply sources as part of the federal, departmental and territorial targeted programs	2.1.3. Increased expenditures by the budgets of all the levels	SRI	2009-2010	
	2.1.4. Developing and approving targets, maximum permissible impacts and territorial plans for attaining the water quality standards in water bodies in accordance with the applicable legislation in the area of use and protection of water bodies and sanitary epidemiological wellbeing of the population	2.1.4.1. Increasing the share of water bodies with water quality objectives and scientifically based maximum permissible impacts	PI	2009-2010	
			2.1.4.2. Methodologies for setting forth MPC of pollutants in water	PI	2009-2010
			2.1.4.3. Methodologies for setting forth current water balances	PI	2009-2010

Target	Actions	Indicators	Indicator type	Time-frame
2.2. Ensure environmentally sound utilization of liquid and solid wastes in areas adjacent to water intakes	2.2.1. Setting special requirements and sanctions to prevent accumulation, storage, and burial of liquid and solid waste, establishment of cattle mortuaries and unauthorized dumps in water protection and sanitary protection zones supported by statutory regimes of the environmental protection of the areas	2.2.1. Decisions of executive authorities to set forth special requirements and sanctions	PI	2009-2010
	2.2.2. Organizing monitoring and mothballing decommissioned, abandoned and operating storage facilities of liquid and solid wastes and developing steps for safe waste utilization, reclamation of the areas that are in a critical ecological status	2.2.2.1. Number of facilities with newly established monitoring of decommissioned, abandoned and operating storage facilities of liquid and solid wastes: 10 facilities – by 2012, All the facilities – by 2020 2.2.2.2. Number of mothballed water structures at mining-and-processing integrated works	PI	2009-2020
2.3. Introduce environmental technologies and facilities for the treatment of wastewater and storm water runoff and the utilization of contaminated sediments	2.3.1. Upgrading water supply systems by implementing modern water treatment, wastewater and storm water treatment techniques, and sludge recovery methods	2.3.1.1. Number of implemented new water treatment technologies 2.3.1.2. Number of demonstration projects implemented through PPP	SRI SRI	2009 -2020 2009-2020
	2.3.2. Establishing buffer zones of seaweed around the pollution sources	2.3.2. Scope of marine environment clean-up and prevented damage	ESI	2009 -2015
2.4. Create and develop water-protection zones and shoreline protection belts at water bodies	2.4.1. Establishing and developing buffer zones around the water supply sources including the implementation of measures for the collection and treatment of surface runoff from residential and production territories	2.4.1. Number of water facilities with well established buffer zones	SRI/ ESI	2009-2020

Target	Actions	Indicators	Indicator type	Time-frame
	2.4.2. Establishing zones of special protection and use of the mothballed water supply sources in case of emergencies	2.4.2. Number of standby sources	SRI	2009-2010
2.5. Improve monitoring of the condition and quality of surface waters and groundwater	2.5.1. Expanding and upgrading networks for the observation of hydrological, hydrochemical, and hydrobiological regimes of water bodies	2.5.1. Number of stationary and mobile points	PI	2009-2020

### **Long-Term Objective #3. Conservation of biological and landscape diversity and the potential for renewable biological resources affected by human-caused pollution**

#### **Indicators of long-term goal achievement**

- increase by 2012 the area of coastal and marine protected natural territories on land and sea to 5% of the Arctic Zone area; and increase coverage of landscape diversity to 85% and biodiversity to 90% by 2012;
- expand the network of terrestrial protected natural territories in the Arctic Zone to 10% of the total area of the Arctic Zone in the framework of Resolution # 725-r of the Russian Government dated May 23, 2001 "On organization of state natural reserves and national parks at the territory of the Russian Federation in 2001-2010" by means of creation of national parks "Russian Arctic" (5.2 mln. hectares), "Onega maritime area" (0.3 mln hectares) and "Beringiya" (3.05 mln hectares)
- increase the financing of scientific research and monitoring on the condition of Arctic biota by 150% by 2012 and until 2020 (indexed for inflation);
- maintain populations of rare and endangered species of animals listed in the Red Book of Russia (polar bear, Atlantic walrus, and others) at the 2006-07 level; and in certain regions, restore (increase) the populations of salmon and whitefish species, waterfowl, shorebirds, raptors,

wild reindeer, and others by 15-20% by 2012;

- create by 2012 regional nurseries for wild plants and seed stations for the supply of sowing and seeding materials for the restoration and rehabilitation of polluted and mechanically disturbed lands in the Nenets and Yamalo-Nenets Autonomous Okrugs

<b>Target</b>	<b>Actions</b>	<b>Indicator</b>	<b>Indicat or type</b>	<b>Time-frame</b>
3.1. Develop new legal and economic instruments for regulating biological resource use in the Arctic and improve the system of payments for biological resource use and the campaign against poaching	3.1.1. Developing and implementing new economic incentives and state regulatory mechanisms, as well as PPP projects in the wildlife conservation practice	3.1.1. Amendments into the existing regulatory legal acts including technical regulations, licenses, encumbrances when conducting competitive biddings, etc.	PI	2009-2012
	3.1.2. Improving legal provisions and rules regulating the rights and obligations of the permanent and alien population concerning the use of biological resources, commercial and non-commercial flora and fauna	3.1.2.1 New rules for the use of biological resources in the Russian Arctic 3.1.2.2 Rules for gathering collectible biological materials including by foreign scientists and tourists	PI	2009-2012
	3.1.3. Introducing amendments into the system of legislation regulations and environmental management in the Arctic zone	3.1.3.1. New approaches to the quoting, licensing and regulation of biological resources use in the Arctic	PI	2009 -2012
	3.1.4. Improving economic and financial mechanisms for the conservation of biodiversity including insurance, compensation for environmental pollution and payment for ecosystem services	3.1.4.1. Regulation on environmental insurance regarding damage to biological resources; increased rates of compensation payments	PI	2009 -2012

Target	Actions	Indicator	Indicator or type	Time-frame
3.2. Strengthen the system of land-based and marine protection of Arctic Zone biodiversity, with consideration for the effects of existing and future human-caused impacts	3.2.1. Establishing new land-based and marine federal-level protected areas in the Russian Federation including national parks such as "Onezhskoye Pomorie", "Russian Arctic", "Berengiya"	3.2.1. Increasing the number, acreage and representation extent of the federal-level protected areas	ESI	2009 -2020
	3.2.2. Establishing regional-level protected areas (reserves, natural parks, traditional nature use areas, etc.) on the coast of the White Sea and Barents Sea, Arctic Archipelagos, Polar Urals, Yamal Peninsular and Taymyr Peninsular, in the North of Yakutia and Chukotka	3.2.2. Increasing the number, acreage and representation extent of the regional-level protected areas	ESI	2009 -2020
3.3. Development of scientific researches on the biota and ecosystems of the Arctic, including research with international participation	3.3.1. Implementing the national program for the Arctic ecosystem and biota inventory	3.3.1. Acreage covered by the flora and fauna inventory studies supported by modern vegetation maps	PI	2009 -2020
	3.3.2. Organizing the stationary network of the Arctic biota and biological resources studies	3.3.2. Research results	PI	2009 -2020
	3.3.3. Support to annual researches on the Russian Arctic biota and ecosystems under the special regional program of the Russian Fund for Fundamental Research	3.3.3. Implementing 20-25 research projects on the Arctic biota and ecosystems a year by increasing RFFI funds for Arctic research	PI	2009 -2020
3.4. Improve the system for monitoring biodiversity and natural ecosystems in the Arctic, and include this system into the circumpolar network for monitoring flora and fauna	3.4.1. Ensuring expanded involvement of Russia in the Arctic Council program "Conservation of Arctic Fauna and Flora" (CAFF)	3.4.1. Number of implemented research projects on flora, water birds, sandpiper, marine mammals, wild northern deer, fish, etc.	PI	2009-2012
	3.4.2. Ensuring Russia's participation in the Circumpolar Biodiversity Monitoring Program and its improvement	3.4.2.1. Russia's contribution to the assessment of Arctic biodiversity (in 2010 and thereafter)	PI	2009-2012

Target	Actions	Indicator	Indicator or type	Time-frame
		3.4.2.2. Operating Arctic Biota Monitoring Center	PI	2009-2020
	3.4.3. Implementing research support projects on biota and ecosystems in the sanctuaries such as Kandalakshsky, Laplandsky, Nenetsky, Gydansky, Taimyrsky, Putoransky, Large Arctic, Ust-Lensky, and Wrangel Island	3.4.3.1. Support projects for Research Units of Sanctuaries 3.4.3.2. Annual biota reports under the program "Nature Records"	PI	2009 -2020
3.5. Organize seed stations and nurseries for wild flora and fauna to support the work of ecological restoration and rehabilitation of disturbed land areas; and carry out re-introduction measures for restoration of populations of species that have gone extinct in certain regions	3.5.1 Organizing seed stations and nurseries for wild flora in the Arctic areas with economic activities	3.5.1.1 Seed stations to support the work of ecological restoration (Nenetsk AO, Yamalo-Nenetsky Okrug, Taimyr Peninsular, North of Yakutia – Tixi) 3.5.1.2 Zoning of foreign Arctic grass plants for rehabilitation	ESI  PI	2009 -2020  2009-2012
	3.5.2. Organizing nurseries for wild flora and fauna to support the work of ecological restoration and rehabilitation of disturbed land areas	3.5.2.1. Geographic network of flora and fauna nurseries, and rare animals nurseries 3.5.2.1 Fish farms for rare fish	SRI	2009 -2020
	3.5.3. Conducting reintroduction activities to restore populations of rare and extinct animals in some areas including musk sheep, wild reindeer, birds of prey and water birds, etc.	3.5.3. Number of restored populations of rare and extinct animals	ESI	2009 -2020

## Long-Term Objective #4. Support for and preservation of favorable conditions for traditional nature use by indigenous small-in-number peoples of the North

Indicators of long-term goal achievement

- regional systems of indigenous environmental co-management in all Arctic regions by 2012;
- increase, by 50% by 2012, the total area of the territories of traditional nature use managed with participation of communities of the indigenous peoples of the North;
- increase, by 30% by 2012, the number of small and medium-sized businesses engaged in traditional nature use in the Arctic Zone;
- methodologies of qualitative evaluation of land, minimization and evaluation of damage caused by industrial use of lands of primordial living environment and traditional way of life of indigenous people, adopted to 2012.

<b>Target</b>	<b>Actions</b>	<b>Indicator</b>	<b>Indicator type</b>	<b>Time-frame</b>
4.1. Improve legislation for protection of the centuries-old way of life of the indigenous peoples of the North, including changes in laws on traditional nature use territories	4.1.1. Preparing proposals for draft of the Federal Law "On protection of the primordial living environment, traditional way of life and traditional Nature Use of small-in-numbers indigenous peoples of Russia"	4.1.1. Proposals for draft of the Federal Law	PI	2009-2009
	4.1.2. Preparing proposals to the drafts of legal and regulatory documents of federal and regional level on qualitative evaluation of land, minimization and evaluation of damage caused by industrial use of lands of primordial living environment and traditional way of life of indigenous people	4.1.2. Draft of regulatory and legal acts of the federal and regional levels	PI	2009 - 2010
4.2. Introduce instruments for comprehensive ecosystem management in areas with compact settlements of indigenous peoples of the North	4.2.1. Preparing proposals for improvement of legal and regulatory acts regulating the procedures for the design and regulatory legal support to the environmental and economic regimes of the territories of traditional nature use	4.2.1. Proposals on improvement of legislation and regulation	PI	2009 - 2010

	4.2.2. Preparing proposals for incorporating the provisions on the environmental and economic regimes of the territories, procedures for the design and regulatory legal support in the Russian Environmental Code to be developed	4.2.2. Proposals for the section of the Environmental Code	PI	2009 - 2010
	4.2.3. Implementing pilot projects for the design and regulatory legal support to the environmental and economic regimes of the territories of traditional nature use with indigenous environmental co-management	4.2.3. Pilot Projects	SRI	2009-2012
	4.2.4. Organizing certification of the territories (including pasture management and hunting ground management) using methodologies of qualitative evaluation of land, minimization and evaluation of damage caused by industrial use of lands of primordial living environment and traditional way of life of indigenous people	4.2.4. Acreage of certified territories	SRI	2009-2020
	4.2.5. Introducing humane animal traps (Yamalo-Nenetsky Okrug, Yakutia, Krasnoyarsky Krai)	4.2.5. Percentage of hunters using humane animal traps	SRI	2009-2012
	4.2.6. Developing, within the Arctic Council, the international project on circumpolar monitoring system with the participation of representatives of the indigenous peoples of the North and using traditional knowledge	4.2.6. Draft of circumpolar monitoring system	PI	2009-2010
4.3. Conduct scientific research and develop an action plan for adapting the traditional nature use of the indigenous nations of the North to climate changes	4.3.1. Implementing pilot projects for value-added processing facilities targeting the products of the traditional nature use and substantial expansion of the product portfolio with the maximum possible involvement of the small-in-numbers indigenous peoples of the North	4.3.1. Number of pilot projects	PI	2009-2012

## **Long-Term Objective #5. Reduction of climate change-related natural and technogenic risks at economic and social facilities**

### Indicators of long-term goal achievement

- assessment report on climate change and its consequences in Russian Arctic, prepared to 2012;
- a national network for social and ecological monitoring of the settlements and communities of indigenous small peoples (provide resources for observation and communication at sites where the indigenous small peoples of the North live in compact settlements), for the purpose of assessing and preventing the adverse consequences of climate change, organized by 2012;
- proposals of the Russian Federation to the report of Senior Arctic Officials at the Ministerial meeting of the Arctic Council in 2011 in a part dealing with necessary activities on adaptation to the climate change

Target	Actions	Indicator	Indicator type	Time-frame
5.1. Create legal, regulatory, methodological, and organizational frameworks for the government's management of risk reduction of the adverse consequences of climate change for the natural environment, economy, and residents	5.1.1. Developing proposals on new and improving and amending the existing regulatory legal acts and methodological documents to reduce the risk of adverse consequences of climate change for the natural environment, economy and residents	5.1.1.1. Draft amendments to the legislation on the design and regulatory legal support to the environmental economic regimes and applied technologies to ensure sustainable development of the Arctic regions in the context of climate change 5.1.1.2 Technical regulations and regulatory documents adopted	PI	2009 -2012
	5.1.2. Establishing a financial mechanism for the support to the activities aimed at reducing adverse consequences of climate change (Adaptation Fund)	5.1.2.1. Draft regulatory legal act on Adaptation Fund 5.1.2.2. Action plan to ensure financing from the Adaptation Fund	PI PI	2009-2009 2009-2009

Target	Actions	Indicator	Indicator type	Time-frame
5.2. Expand fundamental and applied research on the effects of global climate change on the natural environment, economy, and humans in the Arctic Zone	5.2.1. Establishing evidence-based framework for forecasting and assessing the risks of adverse consequences of climate change for the natural environment, economy, and residents	5.2.1.1. Regular forecasts and assessments of climate change risks 5.2.1.2. New methods and models for forecasting the response of the Arctic permafrost and natural environment to climate change 5.2.1.3. Scenarios of the Russian permafrost zone changes over time till 2050	PI  PI  PI	2009-2012
	5.2.2. Developing the environmental and economic framework for the sustainable development of the Russian Arctic areas in the context of climate change	5.2.2.1. Scientific report on the assessment of the consequences of climate change in the Russian Arctic 5.2.2.2. Approved strategy and action plan for the prevention of adverse consequences and use of positive consequences of climate change in the Arctic	PI  PI	2009-2012
	5.3.1. Developing the registry/schedule of the facilities and sites to be replaced, refurbished, strengthened, decommissioned due to the projected climate changes and permafrost degradation	5.3.1.1. Large-scale zoning of the Russian Arctic territories by the time and nature of the projected adverse changes in the natural environment 5.3.1.2. Registry of the facilities (buildings, structures, line infrastructure facilities) located on the land surfaces subject to the loss of ground stability, waterlogging and flooding due to the projected climate change	PI  PI	2009-2012
5.3. Reduce the risks and threats associated with transformation of natural ecosystems, and reduce the development of natural catastrophes in the Arctic Zone as the climate changes				

Target	Actions	Indicator	Indicator type	Time-frame
	5.3.2. Ensuring application of modern techniques, vehicles, technologies of constructions and residential utilities for the projected climate changes 5.3.3 Developing regional strategies and programs of sectoral development in the context of climate change	5.3.2.1. Guidelines, technical regulations 5.3.3.1. Sectoral targeted fisheries development program 5.3.3.2. Sectoral targeted program for the development of utilities in the Arctic settlements and water use 5.3.3.3. Sectoral targeted program for the protection and sustainable development of the near-tundra forests and forests growing on the permafrost soils taking into account their climate regulating and environment protection functions 5.3.3.4. Sectoral targeted program for the of hydropower generation and protection of fresh water ecosystems 5.3.3.5 Sectoral targeted program for developing a network of marine protected areas in the Arctic	PI PI PI PI PI	2009-2012 2009-2012 2009-2009 2009-2009
	5.3.4. Establishing the Russian North National Park	5.3.4.1. National Park	SRI	2009-2012
5.4. Develop scientific-technical and engineering documentation for the reduction of risks and threats stemming from adverse consequences for the economic infrastructure in the Arctic Zone	5.4.1. Conducting environmental and economic assessment of risks and damage for economic infrastructure of the Russian Arctic coastal regions stemming from the permafrost erosion in the context of climate change and permafrost thawing	5.4.1.1. R&D results 5.4.1.2. Methodologies for the assessment of adverse consequences of climate change for the economy and residents	PI PI	2009-2012
	5.4.2. Improving reliability and stability of the Arctic infrastructure facilities to climate change	5.4.2.1. Assessment of the status of the facilities and recommendations to the reduction of potential damage for line, water, engineering structures	PI	2009-2012

Target	Actions	Indicator	Indicator type	Time-frame
		5.4.2.2. Recommendations, adjusted operating regulations to transport facilities (roads, airports, production sites with hard covers) in the context of climate change and permafrost transformation	PI	2009-2012
	5.4.3. Improving engineering glaciological methods for sustainable transport use of winter roads and reduced risk of river and land transportation in the cold season	5.4.3.1. New methods, technical regulations	PI	2009-2012
	5.4.4. Implementing activities to reduce the risk of degradation and to protect the housing, utilities and infrastructure of the Arctic settlements and valuable economic entities from adverse consequences	5.4.4.1. Strengthening grounds and foundations 5.4.4.2. Methodological guidelines, technical regulations, action plans	SRI PI	2009-2012
	5.4.5. Implementing action plan to reduce the risks in the sustainable transport use of the Northern Sea Route	5.4.5.1. Action Plan	PI	2009-2012
5.5. Adaptation of traditional nature use by the indigenous peoples of the North to climate change; and reduce the risks and threats associated with the adverse consequences of climate change for residents of the Arctic Zone	5.5.1. Conducting socioeconomic assessments of risks, threats and projected expenses to the residents stemming from the transformation of the environment and economic infrastructure including the degradation of the residential utilities in the context of climate change	5.5.1.1. Assessments, calculation of damage	PI	2009-2012
		5.5.1.2. Incorporating additional expenditures into the federal and regional budgets	PI	2009-2012
	5.5.2. Developing and implementing a set of steps to protect settlements and engineering structures from enhanced permafrost erosion, higher frequency of floods, increased waterlogging, catastrophic impact of winds and storms	5.5.2.1. Settlements and engineering structures protection programs	PI	2009-2012
	5.5.3. Developing special measures for state insurance of the Arctic residents	5.5.3.1. Federal and regional laws	PI	2009-2012

Target	Actions	Indicator	Indicator type	Time-frame
	5.5.4. Morbidity forecasts for the Arctic population associated with the climate change and developing regional programs for the reduction of morbidity growth risks	5.5.4.1. Regional programs 5.5.4.2. Additional sanitary epidemiological points 5.5.4.3. Public awareness programs on climate change and health	PI PI PI	2009-2009 2009-2012 2009-2020
	5.5.5. Developing regional action plans for the adaptation of the traditional economies of the small-in-numbers indigenous peoples of the North to climate change including in deer husbandry, fisheries, hunting, small commodity production, transportation, camping ground management, etc.	5.5.5.1. Regional programs	PI	2009-2009
	5.5.6. Implementing pilot projects for value-added processing facilities targeting the products of the traditional nature use and substantial expansion of the product portfolio with the maximum possible involvement of the small-in-numbers indigenous peoples of the North (Nenets AO, Yamalo-Nenetsky Okrug, Yakutia, Chukotka)	5.5.6.1. Compact integrated production facilities with modern technologies	PI/ SRI	2009-2012
5.6. Improve the system for monitoring and predicting climate change, its consequences for the natural environment, economy, and residents	5.6.1. Establishing satellite/aircraft and land-based glaciological monitoring for sustainability of economic activities in the Arctic	5.6.1.1. Launching satellites 5.6.1.2. Establishing monitoring stations	PI PI	2009-2012
	5.6.2. Establishing the network of social monitoring of settlements and communities of small-in-numbers indigenous peoples of the North in the context of climate change	5.6.2.1. Social monitoring points furnished with communications	PI	2009-2009
	5.6.3. Ensuring application of modern devices, vehicles, technologies of constructions and residential utilities for the projected climate changes	5.6.3.1. Technical regulations, technologies, technical devices 5.6.3.2. Methodological guidelines	PI PI	2009-2012

<b>Target</b>	<b>Actions</b>	<b>Indicator</b>	<b>Indicator type</b>	<b>Time-frame</b>
5.7. Develop a system for training and education in the area of prevention and elimination of the adverse ecological consequences related to climate change in the Arctic Zone	5.7.1. Establishing the federal and regional systems of training and education for mid-level officials and specialists of governmental authorities in the area of prevention and response of the adverse ecological consequences related to climate change in the Russian Arctic	5.7.1.1. Number of officials and specialists trained	PI	2009-2012
5.8. Development of international co-operation on adaptation to global climate change	5.8.1. Active participation of the Russian Federation in programs of the Arctic Council and other international programs directed to adaptation to global climate change.	5.8.1. Number of projects on adaptation	PI	2009-2020

## Annex 5. General Description of Possible Financial Instruments and Mechanisms for the Support of the SAP-Arctic and Assessment of their Potential

	Financial mechanisms and instruments	Goals	Selection of Applications	Form of government support	Practice of application in the Russian Arctic	Viable areas of support for SAP-Arctic*	Potential of using for the purposes of SAP-Arctic
<b>1. Government financial mechanisms and instruments</b>							
1.1	<i>Federal, regional, and agency target programs</i>	Addressing comprehensive economic, social and environmental problems	Decision of the Government based on substantiations of the related ministries	Direct budget financing	Widely used at the regional level, low efficiency of regional sectoral programs due to lack of own funds	(1), (2) (3), (4), (5)	<i>High Moderate</i>
1.2	<i>Federal directed investment program</i>	Government capital investments in the facilitation of socio-economic development of the country	Substantiations of the related ministries	Direct budget financing	In use, but without taking account of natural and environmental conditions of the regions	(1), (3) (2), (4), (5)	<i>High Moderate Low</i>
1.3	<i>National projects</i>	Concentration of budgetary funds to implement the socio-economic policy priorities	Program activities prepared within the agency strategies for the development of related ministries	Direct budget financing	In use, but with a limited pollution abatement effect	(2),(3),(4), (1), (5)	<i>Moderate Low</i>
1.4	<i>Direct financing of current environmental expenditures</i>	Tapping funds for implementation and financing of environmental initiatives	According to classification of environmental initiatives	Direct budget financing	Widely used to ensure statutory environmental activities	(3) (1), (2), (4), (5)	<i>Moderate Low</i>

	<b>Financial mechanisms and instruments</b>	<b>Goals</b>	<b>Selection of Applications</b>	<b>Form of government support</b>	<b>Practice of application in the Russian Arctic</b>	<b>Viable areas of support for SAP-Arctic*</b>	<b>Potential of using for the purposes of SAP-Arctic</b>
1.5	<i>Regional funds for inter-budgetary transfers</i>	Effective management of financial support for budgets of different levels	Based on calculations in accordance with the Ministry of Finance methodologies	Direct budget financing	Widely used, but without account of natural conditions of the Russian Arctic areas	(1), (3), (2), (4), (5)	<i>High</i>
<b>2 Mechanisms and instruments of public private partnership</b>							
Establishing institutional preconditions for the public and private sector interaction							
2.1	<i>Concession agreements</i>	Attracting investments in the transport infrastructure projects, development of new mineral resources deposits	Agreement between the Russian Government and investors	Bilateral agreements	Used in the development of new minerals deposits; failed to incorporate requirements for rehabilitation of disturbed areas	(2) (1), (3), (4), (5)	<i>High</i> <i>Moderate</i> <i>Low</i>
2.2	<i>Special economic zones</i>	Encouraging the inflow of investments into the manufacturing, innovations, tourism sector, and port infrastructure	Selection of investment projects through competitive bidding conducted by MEDT; the project list is approved by the Russian Government	Direct budget financing + incentive taxation and preferential duties + non-financial incentives	Has not been used in the region up to now	(3), (4) (5) (1), (2),	<i>High</i> <i>Average</i> <i>Low</i>
2.3	<i>Investment Fund</i>	Implementation of major infrastructure and industrial projects	Selection of investment projects through competitive	Direct budget financing + non-financial instruments	Has not been used in Russian Arctic up to now	(1), (3) (2), (4), (5)	<i>Moderate</i> <i>Low</i>

	<b>Financial mechanisms and instruments</b>	<b>Goals</b>	<b>Selection of Applications</b>	<b>Form of government support</b>	<b>Practice of application in the Russian Arctic</b>	<b>Viable areas of support for SAP-Arctic*</b>	<b>Potential of using for the purposes of SAP-Arctic</b>
			bidding conducted by MEDT; the project list is approved by the Russian Government	(government guarantees)			
2.4	<i>Venture funds</i>	Support for the development of high-tech and innovations SME	Competitive bidding to select management companies, which will carry out investment	Investment in the authorized capital of venture funds from the federal budget	Has not been used in Russia up to now	(3) (5) (1), (2), (4),	<i>High</i> <i>Average</i> <i>Low</i>
2.5	<i>Tax exemptions and setoff of obligations</i>	Encouraging implementation of investment projects in the regions	Decisions of authorized federal and municipal bodies based on the investor intention	Reduced rates of taxes, customs duties, interest on government credits	Widely used in the mining and processing works practice	(1), (2), (3) (4), (5)	<i>High</i> <i>Moderate</i> <i>Low</i>
2.6	<i>Provision of long-term soft loans</i>	Encouraging implementation of projects through attractive government credits		Reduced tax rates on government credits	Used in financing NPAF projects in Archangelsk oblast	(1), (2), (3), (4), (5)	<i>Moderate</i> <i>Low</i>
2.7	Participation in the international carbon market and Kyoto Protocol mechanisms	Attracting additional funding for the implementation of project to reduction GHG emissions and		Approving projects, assigning part of the national quota for GHG emissions	Limited practice of projects stipulating the assignment of future GFG emission reductions; JI projects have not been practiced in Russia due to the lack	(1), (5) (3) (2), (4)	<i>High</i> <i>moderate, low</i>

	<b>Financial mechanisms and instruments</b>	<b>Goals</b>	<b>Selection of Applications</b>	<b>Form of government support</b>	<b>Practice of application in the Russian Arctic</b>	<b>Viabile areas of support for SAP-Arctic*</b>	<b><i>Potential of using for the purposes of SAP-Arctic</i></b>
		common pollutants			of approved acceptance procedures		

**\* List of SAP-Arctic priorities:**

- (1) preventing and addressing pollution of the coastal and marine environments caused by onshore and offshore economic activities including oil, chemical and radioactive pollution;
- (2) improving drinking water supply quality;
- (3) conservation of biological and landscape diversity and the potential of renewable natural resources impacted by man-induced pollution;
- (4) supporting and maintaining enabling conditions for the traditional nature use of small-in numbers indigenous peoples of the North;
- (5) mitigating natural and man-induced risks at economic and social facilities due to global climate change