



**Preparation of Regional Pre-Investment Studies in the Eastern Sector of the Russian Arctic**

**Programme of Survey of Current and Historical Land-Based Contamination Sources of the Laptev Sea, East Siberian Sea and Chukchi Sea**

**Pre-investment study**

April 5, 2010

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of the Russian Arctic**

**Final stage of consulting services provided under Contract #CS-NPA-Arctic-  
08/2008 dated August 20, 2008**

**Programme of Survey of Current and Historical Land-Based  
Contamination Sources of the Laptev Sea, East Siberian Sea  
and Chukchi Sea**

**Pre-Investment Study**

Project 0090016

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ERM Eurasia Ltd confirms that this document has been prepared with all reasonable skill, care and diligence and in conformity with the professional standards as may be expected from a competent and qualified consultant acting as Environmental Consultant having experience in providing services for projects with similar scope of work, complexity, issues and scales.

This document has been prepared in accordance with the terms of the Contract concluded with the Client and in conformity with the commonly adopted practice of environmental consulting for the purposes foreseen in the Contract.

The conclusions and recommendations made in this document are based upon information obtained directly by the ERM Eurasia Ltd, as well as information provided by third parties, which we believe to be accurate.

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## CONTENTS

<i>SUMMARY</i>		<i>6</i>
<i>1</i>	<i>INTRODUCTION</i>	<i>9</i>
<i>2</i>	<i>PROJECT DESCRIPTION</i>	<i>10</i>
<i>2.1</i>	<i>BACKGROUND AND OBJECTIVES</i>	<i>10</i>
<i>2.2</i>	<i>HISTORY</i>	<i>10</i>
<i>2.3</i>	<i>DESCRIPTION OF THE FACILITY. TECHNICAL AND TECHNOLOGICAL CHARACTERISATION. SITE LOCATION</i>	<i>11</i>
<i>2.4</i>	<i>OVERVIEW OF THE RISK ASSESSMENT AND ACCIDENT RISK PROBABILITY</i>	<i>11</i>
<i>2.5</i>	<i>PRIORITY CATEGORY FOR THE NPA-ARCTIC PROJECT</i>	<i>11</i>
<i>2.6</i>	<i>APPLICABLE NATIONAL AND INTERNATIONAL REGULATIONS AND STANDARDS</i>	<i>11</i>
<i>2.6.1</i>	<i>International conventions and agreements:</i>	<i>11</i>
<i>2.6.2</i>	<i>Federal Laws of the Russian Federation</i>	<i>12</i>
<i>2.6.3</i>	<i>Decrees of the Russian Government</i>	<i>13</i>
<i>2.6.4</i>	<i>Key Regulatory Documents</i>	<i>13</i>
<i>2.6.5</i>	<i>Regulatory acts related to damages and payments for adverse impact on the environment</i>	<i>17</i>
<i>2.7</i>	<i>ANALYSIS OF ALTERNATIVES TO THE PROJECT</i>	<i>19</i>
<i>2.8</i>	<i>CURRENT STATUS AND ENVIRONMENTAL AND SOCIAL IMPACTS OF THE SITES</i>	<i>19</i>
<i>2.9</i>	<i>PROJECT PREPARATION LEVEL</i>	<i>22</i>
<i>2.10</i>	<i>PROPOSED ACTIVITIES</i>	<i>22</i>
<i>2.11</i>	<i>APPLIED TECHNOLOGIES AND SURVEY METHODOLOGY</i>	<i>23</i>
<i>2.11.1</i>	<i>Requirements and Limitations to Perform Surveys</i>	<i>24</i>
<i>2.11.2</i>	<i>Scale of the study and reflection of background characteristics</i>	<i>25</i>
<i>2.11.3</i>	<i>Density of environmental sampling of soil and groundwater at the Project implementation sites (viewpoints/ sampling points per sq km)</i>	<i>26</i>
<i>2.11.4</i>	<i>Procedure for Collection of Baseline/Test Samples</i>	<i>26</i>
<i>2.11.5</i>	<i>Quality Control Procedure for Sampling and Testing</i>	<i>26</i>
<i>2.11.6</i>	<i>Technical report for studies</i>	<i>27</i>
<i>2.12</i>	<i>LABOUR FORCE REQUIREMENTS</i>	<i>27</i>
<i>2.13</i>	<i>EQUIPMENT REQUIREMENTS</i>	<i>29</i>
<i>2.14</i>	<i>ENERGY REQUIREMENTS</i>	<i>29</i>
<i>2.15</i>	<i>LOGISTICS</i>	<i>29</i>
<i>2.16</i>	<i>ACCOMODATION AND SOCIAL SERVICES</i>	<i>29</i>
<i>3</i>	<i>ENVIRONMENTAL AND SOCIAL ASPECTS OF PROJECT IMPLEMENTATION</i>	<i>31</i>
<i>3.1</i>	<i>BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS IN THE AREA OF PROJECT IMPLEMENTATION</i>	<i>31</i>
<i>3.1.1</i>	<i>Environmental and Geographical Characteristics of the Area</i>	<i>31</i>

3.1.2	<i>Socioeconomic Characteristics of the Area</i>	32
3.2	<i>CURRENT ENVIRONMENTAL AND SOCIAL ISSUES TO BE ADDRESSED BY THE PROJECT</i>	33
3.3	<i>ASSESSMENT OF ENVIRONMENTAL RISKS ASSOCIATED WITH THE CURRENT SITUATION</i>	33
3.4	<i>PRELIMINARY ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE PROJECT</i>	33
3.5	<i>EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS OF THE PROJECT</i>	34
3.6	<i>NATIONAL AND INTERNATIONAL ENVIRONMENTAL PRIORITIES ADDRESSED BY THE PROJECT</i>	34
3.7	<i>STAKEHOLDER ENGAGEMENT PROCESS</i>	36
3.7.1	<i>Administrative and supervisory bodies</i>	36
3.7.2	<i>Non-governmental social and environmental organisations operating in the area affected by the Project</i>	37
3.7.3	<i>Potential Sponsors</i>	38
4	<i>DESCRIPTION OF THE PROJECT INITIATOR / BENEFICIARY</i>	39
5	<i>INVESTMENT FEASIBILITY AND FINANCING PLAN</i>	45
5.1	<i>TOTAL COST OF THE PROJECT</i>	45
5.2	<i>PRELIMINARY PHASES FOR PROJECT IMPLEMENTATION AND BUDGET BREAKDOWN</i>	45
5.3	<i>SOURCES OF FINANCING IDENTIFIED</i>	46
5.3.1	<i>Sources of Budget Financing</i>	46
5.3.2	<i>International Financing Sources</i>	47
5.4	<i>CONTRACTORS</i>	47
6	<i>BENEFICIARY'S FINANCIAL AND ECONOMIC INDICATORS</i>	50
6.1	<i>FINANCIAL REPORTING OF THE BENEFICIARY</i>	
6.1.1	<i>Balance sheet of the main recipient of budget allocations</i>	
6.1.2	<i>Profit and losses statement</i>	
6.1.3	<i>Report on budget execution</i>	
6.1.4	<i>Accounts Receivable and Accounts Payable</i>	
6.2	<i>BUDGET ALLOCATIONS APPROVED FOR 2009</i>	
7	<i>ANALYSIS AND ASSESSMENT OF RISKS AND UNCERTAINTY</i>	51
7.1	<i>ISSUES REQUIRING SPECIAL ATTENTION IN THE PROCESS OF THE PROJECT PLANNING</i>	51
7.1.1	<i>Financial and Economic Aspects</i>	51
7.1.2	<i>Technical Aspects</i>	51
7.1.3	<i>Institutional Aspects</i>	51
7.1.4	<i>Environmental Aspects</i>	51
7.1.5	<i>Social Aspects</i>	51
7.2	<i>MAIN RISKS AND MITIGATION MEASURES</i>	52

<i>7.2.1</i>	<i>Key Risks</i>	<i>52</i>
<i>7.2.2</i>	<i>Mitigation Measures</i>	<i>53</i>
<i>PICTURES</i>		<i>55</i>

**SUMMARY**

<b>PROJECT NAME</b>	Programme of Survey of Current and Historical Land-Based Contamination Sources of the Laptev Sea, East Siberian Sea and Chukchi Sea.
<b>PROJECT SPONSOR AND PROPOSED BENEFICIARY</b>	Ministry of Environmental Protection of the Republic of Sakha (Yakutia)
<b>LOCATION</b>	Anabarsky, Bulunsky, Ust-Yansky, Allaikhovsky and Nizhnekolymsky uluses (districts) in the Republic of Sakha (Yakutia).  Municipalities of Chaunsky and Iultinsky districts in Chukotka.
<b>OBJECTIVES</b>	Inventory and assessment of nature and degree of intensiveness of environmental problems in centers of origin and for recipient objects of potential expansion of pollution along the coastline and coastal aquatic areas of Arctic seas of the Eastern sector of the Russian Arctic.
<b>PROJECT CATEGORY</b>	Priority II: Clean-up of past environmental liabilities with actual or significant future major potential to add to Arctic pollution loads. If the problem remains unresolved, this could lead to consequences of regional and trans-boundary level.
<b>DESCRIPTION OF THE PROJECT ACTIVITIES</b>	<p>The Project comprises the following components:</p> <ul style="list-style-type: none"> <li>• Development and approval of a detailed Programme of Surveys on the basis of this PINS;</li> <li>• Preliminary evaluation of scope and schedule of works; development of a detailed logistics plan and a stakeholder engagement plan;</li> <li>• Procurement of required licences, approval and permits;</li> <li>• Delivery of necessary equipment and vehicles, staff training and mobilisation;</li> <li>• Field works on inventory and surveys;</li> <li>• Preparation of a survey report;</li> <li>• Proposals to issue Statements on compliance</li> </ul>

	<p>(non-compliance) of water and soil quality with regulatory requirements;</p> <ul style="list-style-type: none"> <li>• Development of a Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances;</li> <li>• Development of the long-term Monitoring Programme</li> </ul>
<p><b>TECHNOLOGIES USED</b></p>	<p>The Project will be implemented in accordance with regulatory and standard requirements for baseline surveys and engineering and environmental surveys, i.e. in accordance with SP 11-102-97 "Engineering and environmental surveys" and other regulations and includes the following components:</p> <ul style="list-style-type: none"> <li>• comprehensive baseline field survey;</li> <li>• actual data based assessment of resilience of ecosystems and their ability to rebuild themselves when coping with industrially induced disturbances;</li> <li>• prediction of possible changes in environmental and technical systems, and</li> <li>• assessment of environmental hazards and risks, including formulation of recommendations for actions to prevent harmful and adverse environmental consequences of past industrial activities and protect and restore the environment.</li> </ul> <p>The following types of activities will be conducted while performing surveys:</p> <ul style="list-style-type: none"> <li>• interpretation of remote sensing data for the Project area;</li> <li>• collection of baseline hydrometeorological and hydrological data;</li> <li>• environmental and hydrogeology studies (industrial impact assessment on hydrogeological conditions);</li> <li>• geoecological sampling (soils, surface and underground waters, identification of major pollutants) and determining conditions for pollution dissipation;</li> <li>• analysis and assessment of radiological situation (sampling and isotopic</li> </ul>

	<p>composition and radionuclide concentrations' determination should be conducted in accordance with accepted methodologies of Roshydromet and Ministry of Public Health of the Russian Federation in laboratories licensed to perform such works), and</p> <ul style="list-style-type: none"> <li>• recommendations on organization of local environmental monitoring network.</li> </ul>
<b>PROJECT PREPARATION LEVEL</b>	No technical solutions for the project implementation have been provided as of the time of preparation of this PINS
<b>PRELIMINARY COST ESTIMATE</b>	EUR 900,000
<b>EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS</b>	<p>As a result of the Project implementation the following activities will be performed:</p> <ul style="list-style-type: none"> <li>• Statements on compliance (non-compliance) of water and soil quality with regulatory requirements for sites surveyed will be issued;</li> <li>• Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances will be developed.</li> </ul> <p>A long-term Monitoring Programme for the surveyed sites will be developed.</p> <p>The Project's key performance indicator includes results of objective chemical and analytical data analysis on the amount and concentration of priority pollutants in soil, surface and underground waters and the marine environment as compared to standard values</p>



## ***1 INTRODUCTION***

This document has been prepared by ERM Eurasia Ltd. (ERM) in accordance with Contract on Consulting Services No. CS-NPA-Arctic-08/2008 dated 20 August 2008 with the Executive Directorate of the National Pollution Abatement Facility (NPAF) within the framework of the Project “Preparation and Implementation of Regional Pre-Investment Studies in the Eastern Sector of the Russian Arctic”.

This Project is Component 2 of the Project “Russian Federation – Support for National Programme for the Protection of the Arctic Marine Environment” (The NPA-Arctic Project) and is funded by the Global Environment Facility (GEF). The Executing Agency is the Ministry of Economic Development of the Russian Federation.

The main objective of the NPA-Arctic Project is to develop and establish a sustainable framework to reduce environment degradation of the Russian Arctic from land-based activities on a systematic basis by implementation of a Strategic Action Programme (SAP), which is being developed to comply with obligations of the Russian Federation under international conventions and agreements and taking into account decisions and programmes of the Arctic Council.

The ultimate goal of this Project was to prepare pre-investment studies (PINS) on the investment proposals selected by the NPA-Project in the Eastern Sector of the Russian Arctic, i.e. in the Republic of Sakha (Yakutia) and Chukchi (Chukotka) Autonomous Okrug.

## **2 PROJECT DESCRIPTION**

### **2.1 BACKGROUND AND OBJECTIVES**

The Project includes contamination survey and evaluation of nature and extent of adverse environmental factors at specific pollution sources and for potential receptors along the coastline and in offshore waters of the Eastern Sector of the Russian Arctic.

Subject to surveys are preliminarily identified areas where historical economic activities were performed. Based on the results of surveys, a Statement on compliance of water and soil quality with the regulatory requirements is issued and the Regional Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances is prepared.

The Project has the following objectives:

- 1 Assessment of risks of increasing land-based and marine pollution in the identified areas;
- 2 Assessment of sanitary and epidemiologic situation in terms of chemical pollution and development of proposals on issuing Statements on compliance of soil quality with regulatory norms and land use purposes, and
- 3 Development of measures for clean-up of current sources of chemical land-based and marine pollution and long term monitoring of the sites surveyed.

### **2.2 HISTORY**

Industrial development of the arctic areas in Sakha (Yakutia) and Chukotka began around the same time and is of similar nature. Both regions have hosted numerous mining companies and flotation plants involved in mining and processing of precious metals and polymetals (placer gold, placer and ore tin, tungsten, etc.) Those operations in the region started in the post-war period and had a peak in the 1970-80s.

Similar for both regions is the fact that in early 1990s most mining companies closed down due to depletion of reserves and unprofitability of mining and processing operations. As a rule, most local mining companies stopped their operations abruptly without taking any mothballing or land remediation measures.

Original documentation on used production and processing technologies, as well as pollution monitoring data are either not publicly available or lost.

Termination of transport infrastructure support amplified by the Far North climate conditions caused rapid deterioration of roads; this along with high cost of

air transport and a lack of financial support made it impossible to conduct environmental monitoring for more than 15 years.

During this time, regional bodies of *Rostekhnadzor*, *Rosprirodnadzor* and *Rospotrebnadzor* did not perform planned inspections of closed mining facilities; unscheduled environmental inspections were not financed as companies no longer operated and there were no requests to perform such inspections from the side of legal successors to sites and property.

### **2.3 DESCRIPTION OF THE FACILITY. TECHNICAL AND TECHNOLOGICAL CHARACTERISATION. SITE LOCATION**

Anabarsky, Bulunsky, Ust-Yansky, Allaikhovsky and Nizhnekolymsky uluses (districts) in the Republic of Sakha (Yakutia).

Municipalities of Chaunsky and Iultinsky districts in Chukotka.

The area of these districts accounts for 80% of the coastline of the Laptev Sea in the Republic of Sakha and 70% of the coastline of East-Siberian Sea and Chukchi Sea in Chukotka.

Location of areas of potential pollution is given on Picture 1.1.

### **2.4 OVERVIEW OF THE RISK ASSESSMENT AND ACCIDENT RISK PROBABILITY**

During the PINS preparation process, no information was provided regarding previous emergency risk assessments with regard to closed industrial facilities.

As required by Russian regulations and guidelines of international organisations, a comprehensive risk assessment and development of an Emergency Preparedness and Response Plan for all stages of Project implementation is envisaged at the preparatory stage.

### **2.5 PRIORITY CATEGORY FOR THE NPA-ARCTIC PROJECT**

Priority II: Clean-up of past environmental liabilities with actual or significant future major potential to add to Arctic pollution loads. If the problem remains unresolved, this could lead to consequences of regional and trans-boundary level.

### **2.6 APPLICABLE NATIONAL AND INTERNATIONAL REGULATIONS AND STANDARDS**

#### **2.6.1 International conventions and agreements:**

- Rio Declaration on Environment and Development (Rio de Janeiro, June 3-14, 1992);

- Convention Concerning the Protection of World Cultural and Natural Heritage (Paris, 1972);
- Convention on Biological Diversity (Rio de Janeiro, 1992).

### ***2.6.2 Federal Laws of the Russian Federation***

- Federal Law No.52-FZ dated 30.03.1999 “On Sanitary and Epidemiological Welfare of Population”
- Federal Law No. 3-FZ dated 09.01.96 “On Radiation Safety of Population”
- Federal Law No. 68-FZ dated 21.12.1994 (as amended on 30.10.2007) “On Protection of Population and Territories against Emergencies of Natural and Man-made Origin”
- Federal law No. 2395-12 dated 21.02.92 “On Subsoil”
- Federal Law No. 5151-1 dated 10.06.93 “On Certification of Products and Services”
- Federal Law No. 5485-1 dated 21.07.93 “On State Secret”
- Federal Law No. 92-FZ dated 10.07.01 “On Special Environmental Programmes for Rehabilitation of Radiation Contaminated Lands”
- Federal Law No. 7-FZ dated 10.01.2002 “On Environmental Protection”
- Federal Law No. 184-FZ dated 27.12.02 “On Technical Regulations”
- Federal Law No. 116-FZ dated 21.07.97 “On Industrial Safety of Hazardous Industrial Facilities”
- Federal Law No. 73-FZ dated 03.06.06 “Water Code of the Russian Federation”
- Federal Law No. 136-FZ dated 25.10.01 “Land Code of the Russian Federation”
- Federal Law No. 190-FZ dated 29.12.04 “Land Planning Code of the Russian Federation”
- Federal Law No. 174-FZ dated 23.11.95 “On State Environmental Review”
- Federal Law No. 52-FZ dated 24.04.95 “On Fauna”

- Federal Law No. 89-FZ dated 24.06.98 “On Production and Consumption Waste”
- Federal Law No. 73-FZ dated 25.06.02 “On Cultural Heritage Sites (Historical and Cultural Monuments) of Peoples of the Russian Federation”
- Federal Law No. 49-FZ dated 07.05.01 “On Areas of Traditional Use of Natural Resources of Small Indigenous Peoples of the North, Siberia and the Far East of the Russian Federation”
- Federal Law No. 82-FZ dated 30.04.99 “On Guarantees of Rights of Small Indigenous Peoples of the Russian Federation”.

### ***2.6.3 Decrees of the Russian Government***

- Decree No. 45 dated 26.01.05 “On Organization of Licensing of Certain Types of Activities”
- Decree No. 20 dated 19.01.06 “On Engineering Surveys for Preparation of Project Documentation, Construction, Restructuring of Capital Construction Objects”
- Decree No. 87 dated 16.02.08 “On Contents of Sections of Project Documentation and Requirements for Their Contents”
- Decree No. 145 dated 05.03.07 “On Procedure for Organization and Performance of State Review of Project Documentation and Results of Engineering Surveys”
- Decree No. 140 dated 23.02.94 “On Land Rehabilitation and Removal, Preservation and Rational Use of Fertile Soil Layer”
- Decree No. 293 dated 12.05.05 “On Approval of Statute on State Monitoring of Geological Studies, Sustainable Use and Protection of Subsoil”

### ***2.6.4 Key Regulatory Documents***

- Sanitary norms and rules SNiP 11-02-96. Engineering Surveys for Construction. Basic provisions
- Sanitary norms and rules SNiP 11-102-97. Engineering and Environmental Surveys for Construction;
- Sanitary rules SP 2.2.1.1312-03 Sanitary Requirements for Design of Newly Built and Restructured Industrial Enterprises;

- Sanitary norms and rules SNiP 2.01.15-90 Engineering Protection of Territories, Buildings and Structures from Hazardous Geological Processes. Basic Provisions for Design Preparation
- Sanitary norms and rules SNiP II-7-81 (1995 as amended on 04.97 and 05.99). Construction in Seismic Areas (as well as Addendum to SNiP II-7-81. Construction in Seismic Areas)
- Sanitary norms and rules SNiP 2.1.5.980-00 Wastewater Management in Communities and Sanitary Protection of Water Bodies. Sanitary Requirements for Protection of Surface Waters
- Sanitary rules SP 2.1.5.1059-01 Sanitary Requirements for Protection of Underground Waters from Pollution
- Health standards GN 2.1.5.1315-03 Maximum Allowable Concentration (MAC) of Chemical Substances in Water Bodies Used for Drinking and Domestic Purposes
- Health standards GN 2.1.5.1316-03 Estimated Permissible Limits (EPL) of Chemical Substances in in Water Bodies Used for Drinking and Domestic Purposes (with Addenda)
- Sanitary norms and rules SNiP 2.2.1/2.1.1.1074-01 “Drinking Water. Sanitary Requirements to Quality of Water of Centralized Drinking Water Supply Systems. Quality Control”
- State Standard GOST 17.1.1.01-77 Protection of Nature. Hydrosphere. Water Use and Protection. Main Terms and Definitions”
- State Standard GOST 17.1.1.02-77 Protection of Nature. Hydrosphere. Classification of Water Bodies
- State Standard GOST 17.1.1.03-86 Protection of Nature. Hydrosphere. Classification of Water Use
- State Standard GOST 17.1.1.04-80 Protection of Nature. Hydrosphere. Classification of Underground Waters by Types of Water Use;
- State Standard GOST 17.1.3.13-86 Protection of Nature. Hydrosphere. General Requirements for Protection of Surface Waters From Pollution
- State Standard GOST 17.1.3.06-82 Protection of Nature. Hydrosphere. General Requirements for Protection of Underground Waters
- State Standard GOST 17.1.3.07-82 Protection of Nature. Hydrosphere. Problem of Control of Water Quality of Water Bodies and Waterways

- State Standard GOST 2761-84. Sources of Centralized Economic and Drinking Water Supply. Sanitary, Technical Requirements and Rules for Selection
- State Standard GOST 27065-86 Water Quality. Terms and Definitions
- State Standard GOST P 51871-2002 Water Treatment Facilities. General Requirements for Efficiency and Methods of its Identification
- State Standard GOST P 22.1.11-2002 Safety in Emergency Situations. Monitoring of Status of Water Support Hydraulic Structures (Dams) and Forecasting Possible Consequences of Hydrodynamical Accidents at them. General Requirements
- Sanitary norms and rules SNiP 2.1.7.1287-03 (as amended on 2.1.7.2197-07) Sanitary and Epidemiological Requirements for Soil Quality
- State norms GN 2.1.7.2041-06 Maximum Allowable Concentrations (MAC) of Chemical Substances in Soil
- Health standards GN 2.1.7.2042-06 Estimated Allowable Concentrations of Chemical Substances in Soil
- Assessment of Soils and Grounds in the Course of Performing Engineering and Environmental Surveys for Construction. Main Terms and Definitions (Scientific and research institute NIIPI of Urban Ecology, January 1, 2001)
- Guidelines MU 2.1.7.730-99 "Sanitary Assessment of Soil Quality of Population Aggregates" (approved by the Chief State Health Officer on February 7, 1999);
- Guidelines on Purification and Deactivation of Soil Pollution of Roadside with Oil Products (Recommendations of Rosavtodor, July 13, 2000)
- State Standard GOST 27593-88 Soils. Terms and Definitions
- State Standard GOST 17.4.2.03-86 Protection of Nature. Soils. Soil Passport
- State Standard GOST 17.4.2.01-81 Protection of Nature. Soils. Range of Indicators of Sanitary Condition
- State Standard GOST 17.4.3.04-85 Protection of Nature. Soils. General Requirements for Control and Protection from Pollution

- State Standard GOST 17.4.3.06-86 Protection of Nature. Soils. General Requirements for Soil Classification in Terms of Impact on Them of Chemical Pollutants
- State Standard GOST 17.4.1.02-83 Protection of Nature. Soils. Classification of Chemical Substances
- State Standard GOST 17.4.3.03-85 Protection of Nature. Soils. General Requirements for Methodology of Determining Pollutants
- State Standard GOST 17.4.3.02-85 Protection of Nature. Soils. General Requirements for Protection of Fertile Soil Layer When Land Works are Performed
- State Standard GOST 25100-95 Soils. Classification
- State Standard GOST 17.5.3.04-83 Protection of nature. Lands. General requirements for land rehabilitation
- State Standard GOST 17.5.3.06-85 Protection of nature. Lands. Requirements for determining norms of removal of fertile soil layer when land works are performed;
- State Standard GOST 17.5.1.01-83 Protection of nature. Land rehabilitation. Terms and definitions
- Protection of nature. Land rehabilitation. General requirements to landing
- State Standard GOST 17.5.1.02-85 Protection of nature. Lands. Classification of disturbed lands for rehabilitation
- State Standard GOST 17.5.1.03-86 Protection of nature. Lands. Classification of stripping and adjacent formations for biological land for rehabilitation purposes
- Sanitary norms and rules SNIp2.1.7.1322-03 Sanitary requirements for location and deactivation of production and consumption waste
- Instruction on design, operation and rehabilitation of urban ore polygon (Ministry of Russia, November 02, 1996)
- State Standard GOST P 52108-2003 Resource Saving. Waste treatment. Fundamentals
- State Standard GOST 30772-2001 Resource Saving. Waste treatment. Basic Provisions
- State Standard GOST P52106-2003 Resource saving. Basic Provisions



- State Standard GOST P52107-2003 Resource saving. Classification and determining indicators
- State Standard GOST 30775-2001. Resource saving. Waste treatment. Waste classification, identification and coding. Basic Provisions
- State Standard GOST P52105-2003. Resource saving. Waste treatment. Classification and treatment methods of mercury containing wastes. Basic Provisions
- State Standard GOST 30774-2001. Resource saving. Waste treatment. Waste hazard passport. Main requirements
- State Standard GOST P 51769-2001. Resource saving. Waste treatment. Documentation and regulation of activities to handle production and consumption wastes. Basic Provisions
- Order of the Ministry of Environmental Protection and Natural Resources of the Russian Federation #525/67 dated December 22, 1995 “On Approval of Fundamentals on Land Rehabilitation, Removal, Preservation and Rational Use of Fertile Soil Layer”
- Guidelines on rehabilitation of lands disturbed in the event of transport construction (Guidelines of Central Institute for Construction TsNIIS, November 01, 1983)
- Letter of Roskomzem #3-15/582 dated March 27, 1995 “On Guidelines on indentification of degraded and contaminated lands”
- RD 07-35-93 “Guidelines on Organization and Performance of Control over Mining Rehabilitation of Lands Disturbed by Pits”
- Sanitary norms and rules of designing, operating, conservation, liquidation (burial) of disposal units and hydrometallurgical plants SNP-77-92 (Minatomenergoprom of USSR, 1992)
- Sanitary norms on establishing and operating disposal areas of hydrometallurgical enterprises and enrichment facilities, processing ores and concentrates, containing radioactive and high toxic substances #21-83 (Ministry of Health of USSR, 1983)

### ***2.6.5 Regulatory acts related to damages and payments for adverse impact on the environment***

- Decree of the Russian Government No. 344 dated 12.06.03 “On standard emission charges from stationery and mobile sources,

standard wastewater charges to surface and underground water bodies and production & consumption waste landfilling”

- Guidelines on assessment and reimbursement of damage caused to the environment as a result of environmental violations (approved by Goskomecology of the Russian Federation dated September 06, 1999)
- Decree of the Russian Government No. 632 dated August 28, 1992 “On Approval of the procedure for determining standard charge and its ceiling for environment pollution, waste disposal and other types of adverse environmental impacts”
- Decree of the Russian Government No. 545 dated August 03, 1992 “On Approval of the procedure for development and approval of environmental norms and releases of pollutants to the environment, limits to use natural resources, waste disposal”
- Order of the Natural Resources Ministry of the Russian Federation No. 71 dated March 30, 2007 “On Approval of Methodology to Calculate the amount of damage, caused to water bodies as a result of violation of water legislation”
- Order of Goscomecology of the Russian Federation No. 81 dated February 11, 1998 “On Approval of Methodology of calculation of damage assessment from underground water pollution”
- Temporary methodology for determining prevented environmental damage (approved by Goskomecology of the Russian Federation on March 09, 1999)
- Letter of Natural Resources Ministry of the Russian Federation No. 61-5678 dated December 27, 1993 “On the Procedure for determining amount of damage from land pollution by chemical substances”
- Letter of Roskomzem No. 3-14-2/1139 “On Guidelines on assessment of amount of damage from degrading soils and lands”
- Resolution of Gosgortekhnadzor of the Russian Federation No. 63 dated October 29, 2002 “On Approval of guidelines to assess damage from accidents on hazardous industrial enterprises” (along with RD 03-496-02 “Guidelines on damage assessment from accidents on hazardous industrial enterprises”)
- Decree of the Russian Government No. 273 dated May 08, 2007 “On calculation of amount of damage caused to forests as a result of violation of forest legislation” (along with “Methodology to calculate amount of harm caused to forests, including growing stock or not classified as growing stock trees, bushes and vines as a result of violation of forest legislation”)

- Methodology to calculate amount of harm and accrue amount of damage from extinction of fauna objects or violation of their living environment (approved by Goskomecology of the Russian Federation dated April 28, 2000)
- Resolution of the Ministry of Agriculture of the Russian Federation No. 399 dated May 25, 1999 “On Approval of standard rates for calculation of amount of penalty for damage caused by legal entities and individuals by illegal acquisition or extinction of fauna objects classified as hunting objects”
- Decree of the Russian Government No. 515 dated May 25, 1994 “On Approval of standard rates for calculation of amount of penalty for damage caused extinction, illegal catching or acquisition or extinction of water biological resources”

## ***2.7 ANALYSIS OF ALTERNATIVES TO THE PROJECT***

### Zero Alternative

In case of non-execution of the Project, the current adverse impact of chemical substances on the environment will remain at the same level. Risk of impact related to destruction of dams and tailings storage facilities will increase. Pollutants from non-rehabilitated mining pits will continue to migrate to river basins of the Eastern Sector of the Russian Arctic. Thermal abrasion of the shore and impacts of other hazardous natural processes further increase the threat for regional and transboundary environmental situation.

## ***2.8 CURRENT STATUS AND ENVIRONMENTAL AND SOCIAL IMPACTS OF THE SITES***

During evaluation mission, official representatives of the local authorities responsible for environmental monitoring in Sakha and Chukotka continuously stressed existing lack of financial support for environmental monitoring network in both regions. In particular, funds allocated for environmental monitoring both for the purposes of regulatory inspections and as part of target environmental pollution monitoring programmes are not sufficient to organise sampling and chemical and analytical analyses.

According to the Statute on organization and conducting of state environmental monitoring (approved by Decree of the Russian Government No. 177 dd. 31.03.03 “On organization and conducting of state environmental monitoring”, environmental monitoring is carried out for the following purposes:

- monitoring of the state of the environment, including the state of the environment in the areas of anthropogenic impact and the level of actual environmental impact associated with these sources;

- assessment and prediction of environmental change caused by natural and anthropogenic factors;
- meeting needs of governmental bodies, companies and individuals for reliable information on the state of the environment and environmental change to prevent or mitigate adverse consequences of such change.

Environmental monitoring data are used, in particular, during development of federal and regional target environmental programmes, *investment programmes*, and measures on environmental protection.

Currently, most historic pollution sources in the Republic of Sakha (Yakutia) and Chukotka are associated with abandoned or inactive mines with no owners or operators. Such mines are not covered by regulatory monitoring inspections. For instance, data on the current pollution of surface waters near former Churpunnya mine and Tiretyakh mine in Yakutia and at former military sites on the Kotelny and Bolshoy Lykhovsky islands, part of the New Siberian islands off the coast of Yakutia, and Iultinsky, Polyarninsky and Valkumeysky mine and process plants (GOKs) in Chukotka, are not available and have not been collected for more than 15 years.

Availability of *reliable and up to date data* on the state of the environment is key component of environmental risk assessment and financial estimates needed for implementation of environmental investments, including those related to historic pollution of former GOKs.

In this situation, extrabudgetary financing in form of investments is particularly important for development and implementation of this Project, which serves the need of establishing the environmental baseline in identified “hot spots”, evaluating the magnitude of the current environmental impacts and proposing relevant mitigation measures.

Similar problems related to lack of monitoring data can be encountered throughout the Eastern Sector of the Russian Arctic. It is, therefore, appropriate to address those problems through development and implementation of one inter-regional Project proposing a set of actions for both the Republic of Sakha (Yakutia) and Chukotka.

In Chukotka, the following potential pollution sources with no reliable information on the nature and level of pollution were preliminarily identified:

- **Plamennoye mercury field** is located 40 km to the north of the mouth of Palyavaam River, in the upper reaches of the Ozerny stream, tributary of the Pegtymel River, 150 km to the west of the Mys Schmidta settlement. For ore enrichment, the flotation-pyrometallurgical process was used. After termination of operations, no mothballing or land remediation measures were taken. No data on waste generation are available.

- **West-Polyanskoye cinnabar field** is located 160 km from the town of Pevek. No mothballing or land remediation measures were taken after termination of production operations. No additional reliable data were available on geochemistry of waste rocks, tailings or other pollution sources.
- **Peveksky tin GOK** near the settlement of Valkumey is located directly on the coastline of Chaunskaya Bay, 13 km from the town of Pevek. Dredge tailings form an industrial coastal terrace up to 20-25 m high. The terrace is rapidly eroding. According to available information, xanthogenates and other flotation chemicals were used during the GOK's last years of operations. No reliable data are available on localization and characteristics of slurry collectors. No mothballing or land remediation measures were taken after termination of production operations. Signs of pollution were observed on the site.
- **Iultinsky tin and tungstic GOK** is located in the upper reaches of the Iultinka River, the secondary tributary of the Koyvelvevygyrgyn, which flows into the Chukchi Sea (the Tenkerkykynmangky Lagoon). The site has 1.6 million tons of waste rock, 8 million tons of semi-dry tailings and 3.2 million tons of slurry. The amount of slurry in the slurry collector by 1991 exceeded projected storage capacity. The last data on the status of the tailings facilities and slurry collectors date back to 2001 when an emergency state of the slurry collectors was reported and their wash-out that would result in discharge of the slurry to the Malyshka Stream and further to the Iultinka River was considered possible. It was also estimated that semi-dry tailings might collapse towards the slurry collector. Mine rock and ore under processing at GOK were characterized by excessive arsenic content .
- **Polyarninsky gold mining GOK** is located in the lower reach of the Ryveem River which flows into the East Siberian Sea. In 2005, the facility was closed. There are no reliable data on use of cyanides or flotation agents. Some data indicate that during the washover season of August-September 1999, a portable module processing unit operated in slurry /silt tanks of the Vostochnaya mine of Polyarninsky GOK, using either technical oils or xanthogenate as a collector. No land remediation or mothballing measures were taken after termination of production operations.

In the Republic of Sakha (Yakutia), the following potential pollution sources with no reliable information on the nature and level of pollution were preliminarily identified:

- **Churpunnya mine.** Underground mine workings are located inside of Churpunnya Mountain, located in the north-west of the Ust-Yansky Ulus (district), nearly 200 km from the Deputatsky settlement. The operations included underground tin ore mining and processing of historic tin tailings. In 2008, works were stopped and the mine was abandoned. According to Hunting Department of the Sakha Ministry

of Environmental Protection, the existing natural lake of Churpunnya-Kuele, located at the northern foot of Churpunnia Mountain, was used for discharge and storage of tailings. As a result of longstanding discharge of tailings, the lake is currently dead. According to visual observations, the water in the lake is of intense red colour. The lake seasonally drains to the Syuryukhtyakh River, which flows into the Sellyakh River. The latter flows into the Sellyakh Bay of the Laptev Sea and is used for traditional fishing activities by local indigenous people. There is also a process water pond with the area of around 50 m<sup>2</sup>, located on the side of the mountain. This water pond seems to be regularly overfilled with thaw water and rainwater, with excess water flowing into the Churpunnya-Kuele lake.

- **Tiretyakh mine** is located 50 km to south-west from the Deputatsky settlement. The operations included open-pit mining and underground mining of tin. The site includes an open pit and a mine around 40 m deep. Since 2007, tin had been mined by open pit mining only. According to information from the Hunting Department of the Sakha Ministry of Environmental Protection, the site has four ponds used as tailings storage facilities and silt tanks. During the last inspection by Department's officials (June 2009), those ponds were found nearly overfilled and were considered to pose a threat for the Selennyakh River, the left tributary of the Indigirka River.
- **Abandoned military facilities on the Kotelny and Bolshoy Lyakhovsky islands, part of the New Siberian Islands.** According to the Sakha Ministry of Environmental Protection, those facilities have not been operated for over 20 years and are currently inactive. At the time when troops were withdrawn from the islands, no clean-up or remediation works were performed at the sites. Drums, parts of aircrafts and other scrap metal is scattered over the area. Some drums are still likely to contain lubricants and other technical liquids.
- **Diamond, tin and gold mines in Anabarsky, Oleneksky, and Ust-Yansky Districts.** Those include old mine workings, waste rocks and old hydraulic engineering facilities. Analytical monitoring of the sites is not performed due to their remote location. Any reliable information on the status of the sites and environmental situation in the areas of those mining operations is currently not available.

## **2.9 PROJECT PREPARATION LEVEL**

No technical solutions for the project implementation have been provided as of the time of preparation of this PINS.

## **2.10 PROPOSED ACTIVITIES**

The Project comprises the following components:

- Development and approval of a detailed Programme of Surveys on the basis of this PINS;
- Preliminary evaluation of scope and schedule of works; development of a detailed logistics plan and a stakeholder engagement plan;
- Procurement of required licences, approval and permits;
- Delivery of necessary equipment and vehicles, staff training and mobilisation;
- Field works on inventory and surveys;
- Preparation of a survey report;
- Proposals to issue Statements on compliance (non-compliance) of water and soil quality with regulatory requirements;
- Development of a Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances;
- Development of the long-term Monitoring Programme.

## ***2.11 APPLIED TECHNOLOGIES AND SURVEY METHODOLOGY***

The Project will be implemented in accordance with regulatory and standard requirements for baseline surveys and engineering and environmental surveys, i.e. in accordance with SP 11-102-97 “Engineering and environmental surveys” and other regulations and includes the following components:

- comprehensive baseline field survey;
- actual data based assessment of resilience of ecosystems and their ability to rebuild themselves when coping with industrially induced disturbances;
- prediction of possible changes in environmental and technical systems, and
- assessment of environmental hazards and risks, including formulation of recommendations for actions to prevent harmful and adverse environmental consequences of past industrial activities and protect and restore the environment.

The following types of activities will be conducted while performing surveys:

- interpretation of remote sensing data for the Project area;
- collection of baseline hydrometeorological and hydrological data;
- environmental and hydrogeology studies (industrial impact assessment on hydrogeological conditions);

- geoecological sampling (soils, surface and underground waters, identification of major pollutants) and determining conditions for pollution dissipation;
- analysis and assessment of radiological situation (sampling and isotopic composition and radionuclide concentrations' determination should be conducted in accordance with accepted methodologies of Roshydromet and Ministry of Public Health of the Russian Federation in laboratories licensed to perform such works), and
- recommendations on organization of local environmental monitoring network.

### ***2.11.1 Requirements and Limitations to Perform Surveys***

1. Collection and analysis of baseline hydrological and hydrogeological data by site location.

2. Water sampling from main water bodies upstream and downstream from facilities and existing water wells (if any) and in places where linear facilities cross rivers. It is necessary to perform selection, conservation, transportation and storage of water samples in accordance with requirements of GOST P 51592-2000 Water. General Requirements for Sampling.

2. Sampling of bottom sediments taken from water bodies for analysis of water contamination level in accordance with requirements of GOST 17.1.5.01-80.

3. Swamp water sampling and analysis.

The list of chemical and microbiological indicators of underground water quality, which should be determined during laboratory researches is provided in SP 11-102-97 (appendices G, D, E), SanPiN 2.1.4.1074.01 and SanPiN 2.1.5.980-00. The chemical analysis of water/bottom sediments is performed to receive data on the following indicators:

- general indicators (general hardness, scent 20<sup>0</sup>, suspended materials concentration, solid residue, colour);
- integral indicators (biological oxygen demand, permanganate acid capacity, chemical oxygen demand);
- general salt composition of waters, the Kurlov formula;
- pH;
- heavy metals content (14 metals of main list including Cd, Cu, Pb, Hg, Ni, Zn, Cr, Co, V, Mn, Sn, As, U, Tr, six macroelement metals (Fe, Ca, Mg, K, Na, Al);
- oil products;
- phenols;
- polynuclear aromatic hydrocarbon;
- BTEK;



- Synthetic Surfactants
- ion ammonium;
- anion (sulphate-ion, sulfide-ion, sulfite-ion)
- cyanide and rhodanate

Laboratory surveys should be performed by accredited laboratories in accordance with unified methodologies and GOSTs.

#### *Soil and geochemical studies*

1. Site-by-site baseline survey should be conducted, including soil resilience to anthropogenic disturbances and collection of additional information regarding site specific features of soils of sites, including:

- in accordance with clause 4.19 SP 11-102-97 soil and geochemical sampling will be performed on sampling sites in relation to each identified type of soils and with regard to potentially problematic sites.

2. Chemical analysis should be performed to identify content of:

- Metals (14 metals of the main list, including Cd, Cu, Pb, Hg, Ni, Zn, Cr, Co, V, Mn, Sn, As, U, Tr), six macroelement metals (Fe, Ca, Mg, K, Na, Al);
- cations (including ammonium-ion and manganese) and anions (including sulphates and nitrates);
- oil products;
- BTEK;
- polynuclear aromatic hydrocarbon;
- pH value (KCl, aqueous extract).

3. As additional environmental pollution assessment, chemical analysis of vegetation biomass should be performed to identify:

- metals (14 metals of the main list (Cd, Cu, Pb, Hg, Ni, Zn, Cr, Co, V, Mn, Sn, As, U, Tr)).

#### *Toxicological assessment of the area*

To assess the degree of environmental hazard related to waste (identification of its hazard category) and polluted waters, a toxicity analysis is performed using biotesting methods according to accepted methodologies.

#### *Assessment of radiological situation:*

According to requirements of nuclear safety norms (NRB-99), assessment of the following factors should be performed on the area of new construction:

- radioactivity of surface sediments,
- gamma radiation background;
- radiological indicators of natural waters.

### **2.11.2 Scale of the study and reflection of background characteristics**

- Site-by-site directly for key sites: 1:2,000;
- For the area of direct influence 1:25,000.

### **2.11.3 Density of environmental sampling of soil and groundwater at the Project implementation sites (viewpoints/ sampling points per sq km)**

- Directly for the affected sites 5-10/1-5;
- For the area of direct influence 1-2/1;
- In the area of indirect influence a single sample as part of a sampling programme.

### **2.11.4 Procedure for Collection of Baseline/Test Samples**

- Any baseline soil samples should be taken outside the area of existing influence (more than 500 m away from identified sources of pollution). Unrepresentative samples (those with anomalously excessive values) will be disregarded;
- Baseline soil samples are taken in baseline sampling points according to the programme of geochemical survey in order to identify the secondary dispersion;
- Test soil samples are taken in locations of identified pollution;
- Baseline samples of surface water and groundwater are taken in baseline locations upstream from identified pollution sources;
- Test samples of surface waters are taken downstream in several intermediate points and points of concentration;
- Test samples of underground waters are taken downstream from identified pollution sources.

### **2.11.5 Quality Control Procedure for Sampling and Testing**

#### *Quality control of field works*

During field works, the following test samples are taken and transported:

- Split blank sample received from one vessel poured in different vessels on site and analyzed under different numbers which are not communicated to the for the purposes of quality control of laboratory analysis;
- Trip blank sample (distilled water or clean soil sample from the laboratory) transported to the sampling location and back to confirm that no pollution was added during sample transportation. It is used for samples for volatile organic compounds.

#### *Quality control program for analytical testing*

The quality control program for analytical testing includes assessment of possible sample pollution in the course of sampling preparation and analysis, assessment of correctness of measurements performed and valuation of results reproducibility.

In order to perform quality control programme concurrently with field sampling, a procedural blank, a certified reference material, a field sample

with known added amount of analyzed metals and a sample duplicate are analysed.

In order to assess possible pollution of samples in the course of sampling preparation analysis concurrently with field samples, a procedural blank should go through all stages of analytical procedure. A procedural blank is a sample free from analyzed matrix to which all chemical reagents are added in quantities corresponding to those analysed during sample preparation and analysis of field samples.

In order to confirm correctness of analysis, Certified Reference Material (CRM) with each consignment of samples or quality control standards (QCS) (for instance, Environmental Resource Associates) are analysed. Impact of matrix of analyzed samples on the adequacy of analysis is assessed by extraction of known amount of metals from relevant field sample.

Repeatability of results is confirmed by repeated analysis of 7-10% of sample duplicates.

*Analysis quality criteria:*

- concentration in Procedural Blank should not exceed 5% of measured concentration in the sample;
- deviation of results during analysis of duplicates should not exceed 25% of average value;
- determined content in Certified Reference Material should not exceed 20% or error specified in the certificate;
- value of extracted addition should be within the range of 75-125%.

#### **2.11.6 Technical report for studies**

Technical report is performed in accordance with requirements of article 5.14 SP 11-02-96, and should include the following:

- valuation of acceptability of existing industrial loads on the territory;
- identifying boundaries (sizes and configurations) of areas of influence, ecological zoning and areas with environmental problems and significant environmental risk, and industrially disturbed areas.
- identifying areas of potential cumulative adverse impacts;
- identifying main directions and migration paths, and regular patterns of pollution distribution and accumulation;
- identifying natural and artificial hydrodynamic boundaries;
- analysis of evaluation of environmental risk for each scenario taking into account the cost of environment protection measures and engineering safety structures.

#### **2.12 LABOUR FORCE REQUIREMENTS**

<b>Component</b>	<b>% of total financing, EUR*</b>	<b>Personnel qualification</b>	<b>Number of</b>	<b>Number of man-</b>
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			<b>vacancies</b>	<b>days</b>
Development and approval of a detailed Declaration of Intent based on this PINS	1/9,000	Lead	1	5
		Senior	1	5
		Technical	1	5
Preliminary evaluation of scope and schedule of works; development of a detailed logistics plan and a stakeholder engagement plan	1/9,000	Senior	1	10
		Technical	1	10
Procurement of required licences, approval and permits	1/9,000	Lead	1	5
		Senior	1	10
		Contractor	1	5
Delivery of necessary equipment and vehicles, staff training and mobilisation	12/108,000	Senior	1	10
		Technical	1	40
		Subcontractor	5	40
Field works on inventory and surveys	40/360,000	Senior	4	240
		Technical	4	240
		Subcontractor	6	360
Preparation of a survey report	10/90,000	Lead	1	10
		Senior	2	45
		Technical	2	30
		Subcontractor	2	30
Proposals to issue Statements on compliance (non-compliance) of water and soil quality with regulatory requirements	5/45,000	Senior	1	5
		Contractor	1	20
Development of the Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances	20/180,000	Lead	3	30
		Senior	4	80

		Technical	2	40
Development of the long-term Monitoring Programme	10/90,000	Lead	1	5
		Senior	3	15
		Technical	1	5
<b>Total</b>	<b>100/900,000</b>		<b>52</b>	<b>1,300</b>

\* The rub/euro exchange rate

Project personnel will be involved in works related to preparation to the Project, clean-up and remediation works and reporting.

In addition, logistics personnel will be hired.

Personnel will be recruited under both service agreements with legal entities and individual contracts.

### **2.13 EQUIPMENT REQUIREMENTS**

The following equipment and materials are needed to complete the inventory stage and support expedition and field works:

- Field work gear;
- Survival gear and protective equipment including communication means;
- Field work equipment including special samplers and chemical glassware for sampling;
- Rapid testing devices;
- Consumables.

### **2.14 ENERGY REQUIREMENTS**

Autonomous supply of electricity generated by 3 kW units.

### **2.15 LOGISTICS**

Expedition and field works envisage regular air transportation and leasing of off-road / all-terrain vehicles and helicopters.

Carriers will be selected in accordance with the Contractor's Health and Safety Policy.

### **2.16 ACCOMODATION AND SOCIAL SERVICES**

The Project implementation will be based on standard expedition case when field operations are performed without setting up long-term camps.

Temporary shelters and mobile camps organised for 1 to 7 days do not require establishing permanent housing or social facilities.

### **3 ENVIRONMENTAL AND SOCIAL ASPECTS OF PROJECT IMPLEMENTATION**

#### **3.1 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS IN THE AREA OF PROJECT IMPLEMENTATION**

##### **3.1.1 Environmental and Geographical Characteristics of the Area**

Project implementation area covers a stretch of the coastline between the lower reaches of the Anabar River of the Laptev Sea basin to the Kolyuchinskaya Bay of Chukchi Sea. The total length of the sea surface from north-west to south-east exceeds 2,300 km, and the coastline is over 9,000 km long.

The coastline is entirely located in the permafrost area, in severe climatic arctic conditions. The region is characterized by long winter and short cool summer. The climate becomes less continental from west to the east. Mean air temperatures in January and February are  $-34-21^{\circ}\text{C}$  and the minimum air temperature is  $-50^{\circ}\text{C}$  and lower. The warmest month is July with the average monthly temperature of  $+3-7^{\circ}\text{C}$ . The maximum temperatures in July reach  $+22+24^{\circ}\text{C}$ .

Ice begins to form in the Laptev Sea in October. In winter, the south-eastern part of the sea is covered with massive landfast. Under the influence of prevailing southerly winds, so called Great Siberian Polynya persists every year along the seaward side landfast ice edge that separates landfast from drifting ice. In summer, landfast ice melts and ices to north-west and south-east form stable ice clusters. During unfavourable years, sea ice in summer covers the most of the Laptev Sea, and in favourable years nearly the whole sea is free from ice.

Current sea ice situation in the East Siberian Sea is the most complicated compared to other seas of the Russian Arctic. In summer, for two months (normally August to September) a narrow strip along the coast becomes free from ice. From the Ayon Island to the Long Strait, the southern edge of old ice is often located 10-15 km from the coastline. Heavy pack ices form the Ayon Ice Massive nearly all summer.

Chukchi Sea is fully covered with ice in late October-November. Ice begins to melt in May-June. In summer, a warm current from the Bering Strait divides ice cover into Chukchi and Wrangel ice clusters.

Characteristic for the Arctic seas is cyclonic current of waters. Along the inland coast of the Laptev Sea water moves from west to east and in the eastern part to the north-west. Along the Chukchi shelf, there emerges in summer and in autumn and winter permanently exists a cold Chukotka current which brings to the Beringov strait sweetened waters of the East Siberian Sea cold in summer and relatively warm in winter (temperature  $-1.6^{\circ}\text{C}$ ). In winter, this current brings from Chukchi Sea to the Bering Sea surface waters and ice and forms the Polar Current.

The coastline is characterized by alternation of thermal abrasion sections with abrasion sections and accumulative sections. Rock coasts prevail along the coastline of the Chukchi Sea. There are a lot of bays and gulfs along the coast of the

Laptev Sea and fewer along the coastline of the Chukchi Sea and East Siberian Sea, the latter having lagoons and deep bays.

The largest river basins are Anabar, Olenek, Lena, Yana, Indigirka, Alazeya, Kolyma, and Amguema. Due to active frost-thaw processes, tundras near the sea have numerous lakes.

In terms of biogeography, the region belongs to a zone of arctic and subarctic highland and lowland tundras and includes both lowland tundra landscapes along the coast of the North Siberian, Yana-Indigirka and Kolyma lowlands and mountain tundra and goltsy landscapes of branches of the Verkhoyansk Range and Chukotka Highland.

The protected nature areas in the region include Ust-Lensky Nature Reserve, in Sakha and the Wrangel Island, in Chukotka, as well as 126 regional protected nature areas both in Sakha and Chukotka.

### **3.1.2 Socioeconomic Characteristics of the Area**

**The Republic of Sakha (Yakutia)** is the largest Russian region exceptionally rich with natural resources. The population is 949,753 people (2009). The share of urban population is 64.3% (2002) and population density is 0.3 persons per sq km.

The Republic includes 36 municipalities, including 34 municipal districts (*uluses*) and 2 urban districts, with 5 districts covered by this PINS. Municipalities comprise 365 urban and rural settlements (*naslegi*), including 31 indigenous naslegs, of which 11 are located in the area of Project implementation. Part of the Sakha Arctic uluses is part of the borderland of the Russian Federation.

The area has few roads which can be used all year round. Logistics is largely through all-terrain vehicles and motor traffic using the network of temporary and winter roads, aviation, and rivers that serve as main traffic corridors.

Apart from extensive mining operations, reindeer husbandry is an important part of the culture of local small indigenous peoples and is commonly found in the Sakha Arctic.

**Chukotka** is located in the farthest northeast of Russia and occupies all the Chukci Peninsula, part of the mainland and a number of islands, including the Wrangel Island, Ayon Island, Ratmanov Island, etc.) The population is 49,500 people (2009). The population density is 0.07 persons per sq km, and the share of urban population is 66.4% (2009). Chukotka is an area with the boundary regime. Arrival of Russian nationals to some areas in the district adjacent to the coastline and to the islands is regulated.

Chukotka comprises 5 districts, out of which 2 are covered by this PINS. The entire area is officially recognized as an indigenous area where nomadic deer raising is developed.



The transport network of the region is based on the network of winter roads and off-road roads. Air transportation is limited. Part of the areas of Project implementation is linked by all-year motorways Pevek-Egvekinot and Egvekinot-Amguema.

### **3.2** *CURRENT ENVIRONMENTAL AND SOCIAL ISSUES TO BE ADDRESSED BY THE PROJECT*

The Project will address the following potential significant environmental and social issues:

- 1 Environmental impact associated with hazardous and toxic substances accumulated in tailings, slurry ponds and waste rocks, chemical contamination of soils, surface waters and sea water.
- 2 Health & safety of local communities, including indigenous communities involved in traditional use of natural resources; deterioration of sanitary and epidemiologic situation.
- 3 Impacts of chemical substances on the local biodiversity, including accumulation of toxic substances in tissues of living organisms.
- 4 Risk of injuries of wildlife from scrap metal and chemical contaminants.
- 5 Impact on quality of local fisheries.

### **3.3** *ASSESSMENT OF ENVIRONMENTAL RISKS ASSOCIATED WITH THE CURRENT SITUATION*

Risks related to possible significant non-prevented environmental damage are considered as **high**. The scale of potential marine pollution can potentially be at **regional and transboundary** level, affecting Russia's obligations in the framework of international environmental agreements.

### **3.4** *PRELIMINARY ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE PROJECT*

The Project is expected to have minimal adverse environment and social impacts.

Movement of off-road machinery outside existing roads will be avoided.

Sampling will be done in accordance with best available practices. Specifically, earth workings such as small trenches and wells will be thoroughly reclaimed, and sampling wastes and household waste will be properly disposed of.

### **3.5** *EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS OF THE PROJECT*

As a result of the Project implementation the following tasks will be completed:

- Statements on compliance (non-compliance) of water and soil quality with regulatory requirements for sites surveyed will be issued;
- Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances will be developed.

A long-term Monitoring Programme for the surveyed sites will be developed.

The Project's key performance indicator includes results of objective chemical and analytical data analysis on the amount and concentration of priority pollutants in soil, surface and underground waters and the marine environment as compared to standard values.

### **3.6** *NATIONAL AND INTERNATIONAL ENVIRONMENTAL PRIORITIES ADDRESSED BY THE PROJECT*

Project activities agree with the two key areas of the Strategic Action Program for Protection of the Russian Arctic Environment (SAP-Arctic):

- Prevention and abatement of pollution of the coastal and marine environments in the Russian Arctic, including the transboundary transport of pollutants with aquatic and atmospheric flows oil, chemical, and radiation contamination;
- Conservation and improvement of the quality of the environment, living conditions of the indigenous small-in-numbers peoples and conditions for traditional nature use by native small nations of the North.

Under the first component, the Project follows the following objectives:

- Reducing the negative environmental impacts in the hot spots in the Russian Arctic;
- Developing/improving financial and economic mechanisms for attracting investments to solve environmental problems in the Russian Arctic;
- Developing international cooperation among the Arctic countries in the area of environmental protection in the Russian Arctic.

Under the second component, the following main objectives will be reached:

- With respect to remedying past environmental damage on land and in the coastal zone of the Arctic seas:
  - Improving, at the federal and regional levels, the legal and regulatory frameworks for control of petroleum, chemical, and radioactive contamination associated with activities on the land and continental shelf;
  - Expanding public-private partnerships to improve effectiveness of environmental protection;
  - Developing and implementing investment projects aimed at remedying past environmental damage on land and in the coastal zone of the Arctic seas;
  - Using the existing and developing new international instruments for attracting investments into the implementation of environmental projects in the Russian Arctic.
  
- With respect to improving the surface and ground water quality in the coastal areas of the Russian Arctic:
  - Improve monitoring of the condition and quality of surface and ground waters.

The Project also agrees with the main objectives of the Government Policy in the Arctic defined in the Basic Provisions for the National Policy of the Russian Federation to 2020 and onwards (approved by President on 18.09.2008). In particular, in the field of environmental safety the Project aims at one of the main objectives of the Russian Arctic Policy, i.e. conservation and protection of the natural environment in the Arctic, elimination of environmental consequences of human activities under the conditions of intensification of economic efforts and global climate change. The Project shall ensure the following measures in order to reach the goals of the Russian Arctic Policy in the field of environmental safety in the Russian Arctic region:

- setting special regimes of use of natural resources and environmental protection in the Russian Arctic, including monitoring of its pollution;
- remediation of natural landscapes;
- processing of toxic industrial wastes;
- ensuring of chemical safety.

Measures to establish environmental monitoring system in Sakha are proposed by the regional government target programme “Environmental Protection in the

Republic of Sakha (Yakutia) in 2007-2011". Around 6.5 million roubles were allocated under subprogramme "Establishing State System of Environmental Monitoring".

### **3.7 STAKEHOLDER ENGAGEMENT PROCESS**

#### **3.7.1 Administrative and supervisory bodies**

- **Administrations of municipalities**

Approval of land-related issues, legal successors of closed mines.

- **Ministry of Environmental Protection of the Republic of Sakha (Yakutia)**

Surveillance measures, permitting documents, state environmental review of projects at the regional level, environmental monitoring.

- **Administration of the Chukchi Autonomous District, Chaunsky District and Iultinsky District.**

Approval of land-related issues.

- **Regional departments of *Rosprirodnadzor***

Supervisory activities, approval of survey programme, permitting, expert review, environmental monitoring.

- **Regional departments of *Rospotrebnadzor***

Supervisory activities, approval of survey programme, expert review, sanitary and epidemiological reports, participation in surveys, project support.

- **Regional departments of *Rostekhnadzor***

Supervisory activities, approval of survey programme, licensing, permitting, expert review.

- **Regional departments of the Subsoil Use Agency**

Approval of survey programme and design documents, expert review.

- **Regional departments of Amur and Lena Basin Water Division Agencies**

Approval of survey programme and the design documents.

- **Sakha and Chukchi Hydrometeorology and Environmental Monitoring Agencies**

Hydrometeorological and environmental monitoring licensing; hydrometeorological expert review, supply of weather station reports, supply of hydrometeorological data, hydrometeorological surveys, participation in the monitoring programme.

- **Regional departments of the Federal Service for Veterinary and Phytosanitary Supervision (*Rosselkhoznadzor*)**

Approvals and supply of information about biological and food products.

- **Lena and North-Western Regional Department of the Federal Fishery Agency (*Rosrybolovstvo*)**

Approvals and catch quotas for scientific purposes as part of surveys, participation in gathering of information related to the condition of water biological resources.

- **Territorial branches of FGU Territorial Information Fund in the Far Eastern Federal District of Ministry of Natural Resources**

Supply of archive data.

- **Far Eastern department of the Federal Service for the Cultural Heritage Legislation Compliance Supervision (*Rosokhrankultura*).**

Approvals and supply of archive data.

- **Border Service of the Russian Federal Security Service**

Approval of surveys and other activities; entry permits for foreign nationals.

### ***3.7.2 Non-governmental social and environmental organisations operating in the area affected by the Project***

#### ***International and Russian organisations:***

- Bellona;
- Greenpeace-Russia;
- WWF-Russia;
- The International Union for Conservation of Nature (IUCN), Russia;
- The International Social and Environmental Union;
- The Civil Centre for Nuclear Non-Proliferation;
- The Environmental Safety and Protection Commission of the Public Chamber;
- Public Organisations Union 'Russian Environmental Congress';

- Green Patrol;
- The Russian Society for Ecological Economics (RSEE);
- The International Society for Ecological Economics (ISEE);
- The International Ecological Engineering Society (IEES).

***Regional:***

- Chukchi regional charity environmental public movement ‘Caira-Club’ (Anadyr);
- Center for Environmental Education of the Republic of Sakha (Yakutia) –Eige;
- Public Environmental Center of the Republic of Sakha (Yakutia);
- Yakutian division of the Russian Nature Conservation Society;
- Public Environmental Monitoring Network of the Republic of Sakha (Yakutia).

**3.7.3 Potential Sponsors**

- **Ministry of Natural Resources and Environment of the Russian Federation**

Evaluation of the PINS using criteria developed under the Elimination of Past Environmental Liabilities in Russia project, approval of putting the Kular project on the list of PEL sites requiring urgent actions to eliminate historic pollution.

- **World Bank**

Co-financing of the Elimination of Past Environmental Liabilities in Russia project.

- **Nordic Environmental Finance Corporation (NEFCO)**

Fund Manager of the Arctic Council’s Project Support Instrument which is likely to be used to finance development of pre-feasibility studies, environmental impact assessments, business plans, financing plans, technical projects, tender documents or supplies of equipment and services for the project.

#### 4 DESCRIPTION OF THE PROJECT INITIATOR / BENEFICIARY

The Project Initiator and potential Beneficiary is the Ministry of Environmental Protection of the Republic of Sakha (Yakutia) (hereinafter the Ministry).

In Chukotka, the Project is expected to be managed under an agreement between the Ministry and the Administration of Chukotka.

If any *Rospotrebnadzor* owned laboratories or other laboratories in Chukotka will be used, an agreement will be signed with relevant agencies. The Ministry has been selected as a Project Initiator and Beneficiary for both regions due to the need to use a uniform approach to the surveys and centralise planning.

The Ministry is an executive governmental body of the Republic of Sakha (Yakutia). The Ministry is governed by the Statute on the Ministry of Environmental Protection of the Republic of Sakha (Yakutia) (hereinafter the Statute) approved by the Resolution of the Sakha Government No. 78 dated 28 February 2009.

The Ministry is an executive government body of the Republic of Sakha (Yakutia) in the area of environmental protection and is a legal entity.

Within its jurisdiction, the Ministry holds functions to develop public policy, propose new legislation and manage, coordinate and supervise environmental protection measures, including protection of atmospheric air, water bodies, forests, habitats, aquatic biodiversity, and protected nature areas, as well as management of industrial and municipal waste, environmental monitoring, state environmental impact assessment, radiation safety, and environmental formal and informal education.

The Ministry coordinates, manages and supervises Departments subordinate to it as well as state institutions and enterprises that are part of its structure.

Main tasks of the Ministry include:

- identification of main directions of environmental policy formulation in the Republic of Sakha (Yakutia);
- implementation of the federal environmental policy in the Republic of Sakha (Yakutia);
- development of new regional legislative acts and drafts of legal documents on issues falling under the responsibility of the Ministry and its departments, and preparation of annual work plans and performance indicators of the Ministry's activities;
- development and implementation of regional environmental programmes, participation in implementation of federal targeted environmental programmes and in socio-economic development

programmes of municipalities and environmental plans of governmental bodies;

- implementation of government policies concerning management of protection, registration and use of natural resources;
- regional state environmental monitoring and control of economic activities in the Republic of Sakha (Yakutia), except for those that are subject to federal state environmental monitoring and control;
- monitoring of radiation situation in the Republic of Sakha (Yakutia);
- development of environmental education system in the Republic of Sakha (Yakutia);
- management of regional protected nature areas, state control on regional and local protected nature areas, and maintenance of state register of protected areas in the Republic of Sakha (Yakutia);
- public disclosure of information on the state of the environment in the Republic of Sakha (Yakutia);
- regulation of natural resources use together with other executive bodies in the Republic of Sakha (Yakutia);
- integration and implementation in various departments and structural units of the Ministry of result-orientated management procedures, and
- implementation in various departments and structural units of the Ministry of public services standards and administrative regulations.

In accordance with the Statute, the Ministry exercises powers in the following areas:

- water protection;
- protection of atmospheric air;
- forest protection;
- management of industrial and municipal wastes;
- protection and use of fauna;
- state environmental review;
- radiation safety;
- management of protected areas;
- environmental education, and



- state environmental monitoring and control.

The Ministry implements other tasks specified in the Statute, including:

- maintaining the Sakha Red Book of Soils;
- establishing environmental quality standards, containing requirements and limits not lower than relevant federal requirements and limits;
- issuing emission/ discharge permits to companies, except for those subject to federal state environmental monitoring and control;
- providing methodological assistance to local authorities on environmental protection issues;
- keeping records of sites of economic operations and environmental impact sources subject to regional state environmental monitoring and control, and
- controlling timely payment of environmental charges for adverse environmental impact from companies, except for those subject to federal state environmental monitoring and control.

The Ministry is entitled to:

- receive from federal and regional authorities and companies information necessary to effectively perform its functions;
- carry out inspections of organizations and companies regardless of their ownership, except for those subject to federal control, and review documents and records necessary to perform state environmental monitoring and control;
- check compliance with environmental regulatory requirements of the Russian Federation and the Republic of Sakha (Yakutia) during construction, commissioning, operation and decommissioning of industrial and other facilities;
- In case of violation of environmental legislation, impose requirements on, and issue enforcement notices to, individuals and companies to remedy the situation;
- Impose administrative liability on individuals found to be in breach of environmental regulations;
- file petitions to a court appeals for the restriction, suspension or prohibition of economic or other activities by companies and individuals found to be in breach of environmental regulations;

- report cases of environmental crime or administrative violations to law enforcement agencies and other regulatory or supervisory bodies,
- file lawsuits to pay for environmental damages resulted from violation of environmental legislation, etc.

Under Regional Law “On State Budget of the Republic of Sakha (Yakutia)” and Federal Law No. 184-FZ dated 06.10.99 “On Main Principles of Organization of Legislative and Executive Bodies of the Russian Federation”, expenditures of the Ministry (like other regional executive agencies) are financed from the regional budget.

#### **Contact information:**

Full name	Ministry of Environmental Protection of the Republic of Sakha (Yakutia)
Legal address:	3/1, Dzerzhinskogo St., Yakutsk, 677000
Postal address:	3/1, Dzerzhinskogo St., Yakutsk, 677000
Telephone, fax	Tel. +7 (4112) 34-12-, fax: +7 (4112) 42-13-72
E-mail:	<a href="mailto:sterh@sakha.ru">sterh@sakha.ru</a>
IIN	1435035723
KPP	143501001
Minister	Vladimir Afanasievich Grigoriev

#### **Organizational Structure**

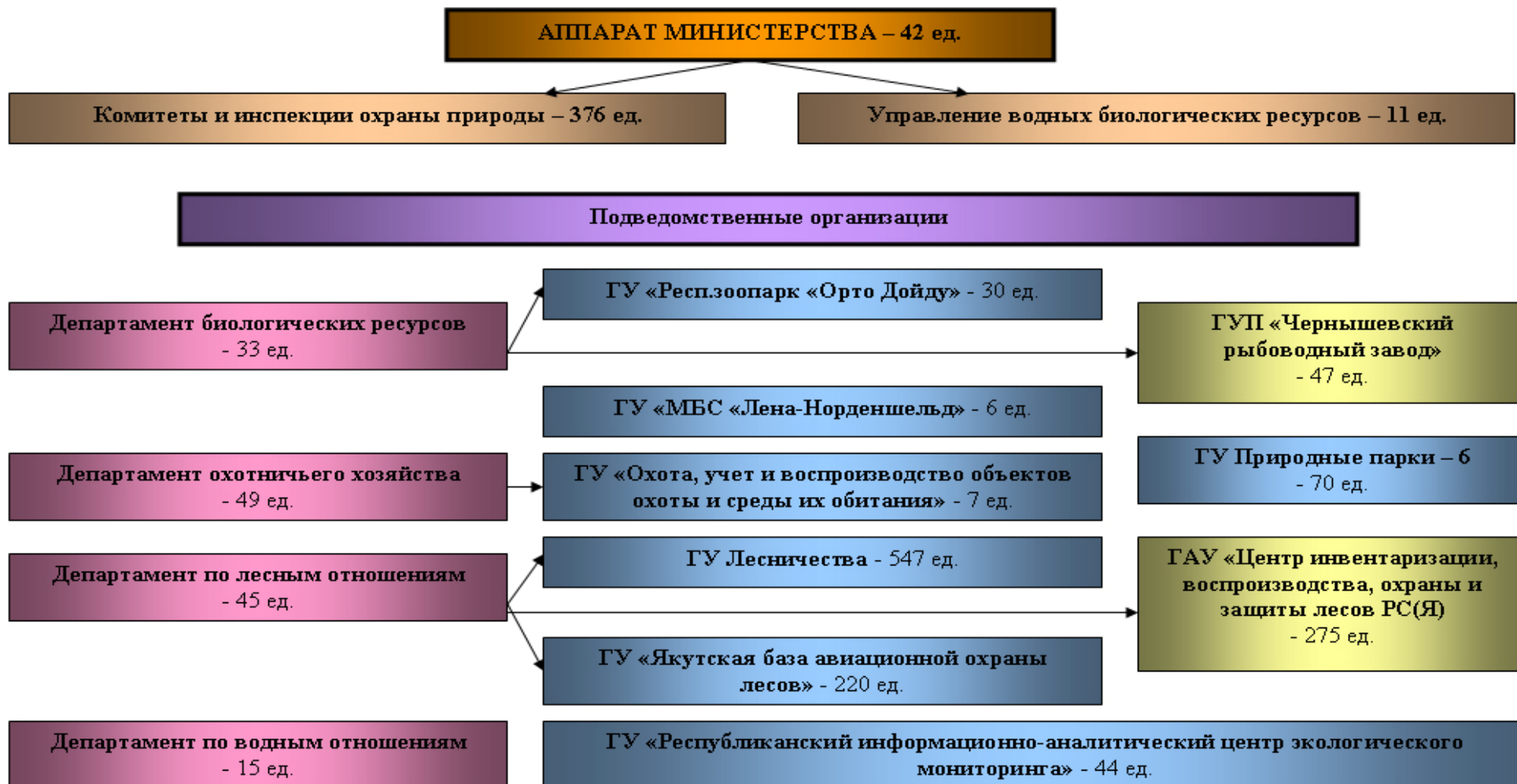
The Ministry comprises the following departments:

- Environmental committees and inspections,
- Water Biological Resources Division
- Operational Inspection of State Environmental Control
- Water Relations Department;
- Biological Resources Department;
- Forest Department;
- Hunting Department;

- Yakutia Forest Aviation Security Base
- Republican Information and Analytical Environmental Monitoring Centre
- Orto Doidu Zoo
- Lenskie Stolby Natural Park
- Chernyshevsky Fish Breeding Plant
- Lena-Nordensheld International Biological Station

The organigram (in Russian) is shown below.

**СТРУКТУРА**  
**Министерства охраны природы Республики Саха (Якутия)**  
 (по системе всего 1817 ед.)



## 5 INVESTMENT FEASIBILITY AND FINANCING PLAN

### 5.1 TOTAL COST OF THE PROJECT

The preliminary total cost of the Project is estimated at EUR 900,000.

### 5.2 PRELIMINARY PHASES FOR PROJECT IMPLEMENTATION AND BUDGET BREAKDOWN

The Project will be implemented in three stages:

- Stage 1 (1<sup>st</sup> year of Project implementation) – development of a detailed logistics plan and preparation works )
- Stage 2 (1<sup>st</sup> year of Project implementation) – field works and scoping for surveys.
- Stage 3 (1<sup>st</sup> – 2<sup>nd</sup> year of Project implementation)– preparation of a survey report, issuing Statements and development of a regional (interregional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances and preparation of a long-term environmental Monitoring Programme.

	<b>Preliminary terms</b>	<b>Component</b>	<b>% of total amount of financing/amount (Euro) *</b>
1	1 <sup>st</sup> year of Project implementation	Development and approval of a detailed Declaration of Intent based on this PINS	1/9,000
2	1 <sup>st</sup> year of Project implementation	Preliminary evaluation of scope and schedule of works; development of a detailed logistics plan and a stakeholder engagement plan	1/9,000
3	1 <sup>st</sup> year of Project implementation	Procurement of required licences, approval and permits	1/9,000
4	1 <sup>st</sup> year of Project implementation	Delivery of necessary equipment and vehicles, staff training and mobilisation	12/108,000
5	1 <sup>st</sup> year of Project implementation	Field works on inventory and surveys	40/360,000
6	1 <sup>st</sup> year of Project implementation	Preparation of a survey report	10/90,000

7	1 <sup>st</sup> – 2 <sup>nd</sup> year of Project implementation	Issuing Statements on conformance of natural waters and soils to regulatory norms	5/45,000
8	1 <sup>st</sup> – 2 <sup>nd</sup> year of Project implementation	Development of the Regional (inter-regional) Concept on measures to clean up and remediate affected sites and management of potential hazardous and toxic substances	20/180,000
9	1 <sup>st</sup> – 2 <sup>nd</sup> year of Project implementation	Development of the long-term Monitoring Programme	10/90,000
		<b>Total</b>	<b>100/900,000</b>

\* The ruble/euro exchange rate of 1/45 is used for calculations

### 5.3 SOURCES OF FINANCING IDENTIFIED

In identifying potential sources of financing for the Project, a number of factors critical for potential sponsors were taken into consideration as follows:

- Non-commercial nature of the Project which is basically unprofitable from the perspective of potential investments;
- Gaps in legal and regulatory base for the public finance of measures on elimination of environmental liabilities in Russia at the moment of preparation of the PINS;
- Lack of a uniform methodology for the risk assessment of environmental liability sites, and
- Limited regional budget financing.

#### 5.3.1 Sources of Budget Financing

Measures to establish environmental monitoring system in Sakha are proposed by the regional government target programme “Environmental Protection in the Republic of Sakha (Yakutia) in 2007-2011”. Around 6.5 million roubles were allocated under subprogramme “Establishing State System of Environmental Monitoring”.

In Chukotka, co-financing from the regional budget was not proposed or discussed.

During the meeting with Mr. Andrei Peshkov of the Russian Ministry of Natural Resources and Environment and Mr. Vassili Rodionov of the World Bank in the World Bank office in Moscow on February 11, 2010 regarding potential funding of the Project under the the Elimination of Past Environmental Liabilities in Russia project, it was noted that evaluation of this PINS was necessary using criteria of environmental liability inventory that are currently being developed

in the framework the Elimination of Past Environmental Liabilities in Russia project.

In case priority PEL elimination measures are considered necessary as a result of such evaluation, budget funding for the Project can be made available in the course of 2011 to 2012.

### **5.3.2 International Financing Sources**

Following discussions with Messrs. Henrik Förström and Amund Beitnes of NEFCO held in August 2009 to February 2010, it was confirmed that the Project is in line with the priorities of the Arctic Council's Project Support Instrument which will be managed by NEFCO as soon as the PSI is commissioned in the first half of 2010.

This PINS has been submitted to NEFCO and is currently under review in the PSU Unit headed by Amund Beitnes.

## **5.4 CONTRACTORS**

The Customer (Beneficiary acts through a Contractor, or the Project Coordinator. Contractor (subcontractor) organizations, including those from Chukotka are retained by the Project Coordinator on a tender basis. Organizations from Chukotka interact with the administration under a special agreement.

1. During Stages 1 and 2 licenced research and design organisations will be engaged in inventory, preparation for surveys and development of design and working design documents.

Below is the recommended list of participants in Stages 1 and 2 of the Project:

- **An international specialised environmental consulting company**

International project finance arrangements; organisation and coordination of baseline surveys and engineering and environmental surveys, development of environmental protection sections of design documents of both Russian and international formats.

- **NPO Typhoon (belongs to the Russian Federal Hydrometeorology and Environmental Monitoring Service)**

Participation in chemical and analytical programme of surveys.

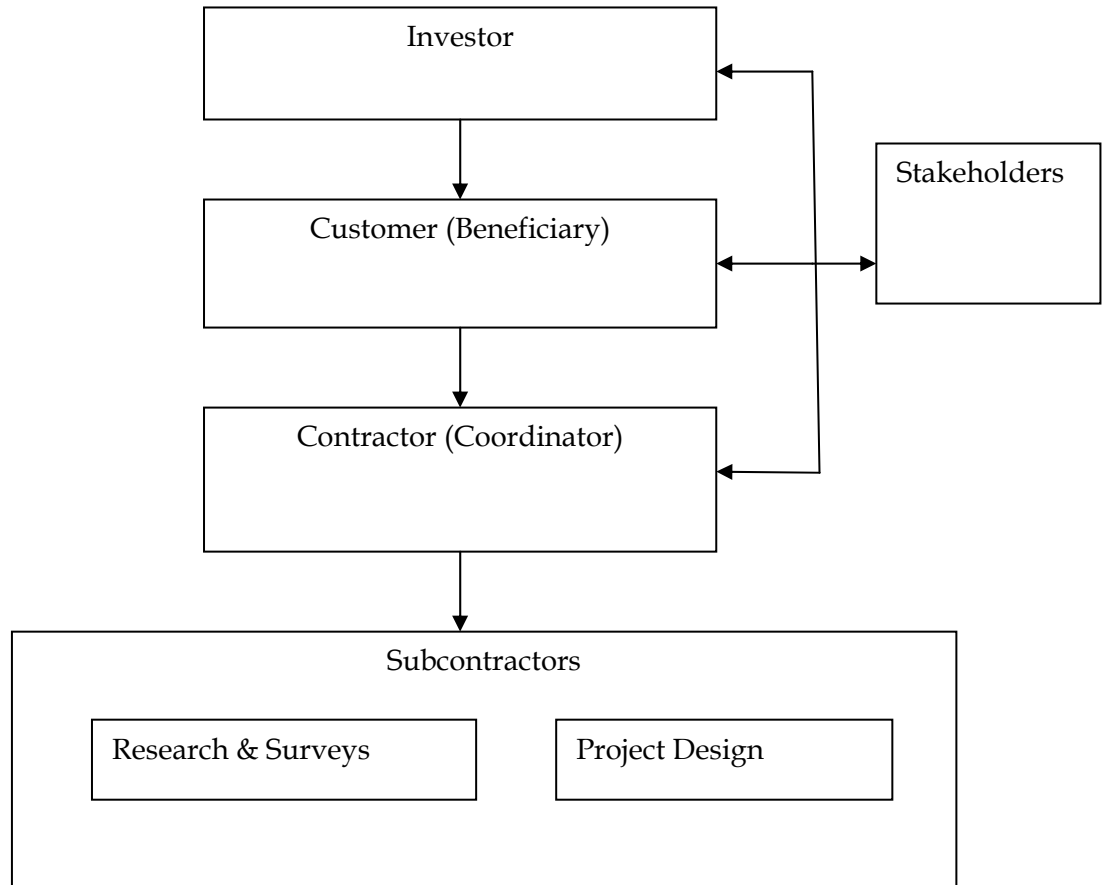
- **Khabarovsk Innovation and Analytical Centre of the Kosygin Institute of Tectonics and Geophysics of the Far Eastern Branch of the Russian Academy of Sciences**

Participation in chemical and analytical programme of surveys.

2. For Stage 3, transport companies and engineering organisations will be engaged to perform a set of preparatory and logistical activities on a public tender basis.

The project management diagram is shown in Fig. 4.1.





## **6      *BENEFICIARY'S FINANCIAL AND ECONOMIC INDICATORS***

This information can be obtained from the NPA Arctic Project Office or from the Executing Agency

## **7 ANALYSIS AND ASSESSMENT OF RISKS AND UNCERTAINTY**

### **7.1 ISSUES REQUIRING SPECIAL ATTENTION IN THE PROCESS OF THE PROJECT PLANNING**

#### **7.1.1 Financial and Economic Aspects**

- High transportation cost and seasonal character of logistics plans;
- Financial flows and payment schedule;
- Overhead and current operating expenses while using vehicles and equipment.

#### **7.1.2 Technical Aspects**

- Remoteness of the project implementation area;
- Extremely severe operating conditions for materials, mechanisms and equipment;
- Compliance with health & safety requirements;
- Project implementation schedule, strict requirements for representativity of samples which depends on time lag of fulfillment of expedition and field stage.

#### **7.1.3 Institutional Aspects**

- Legitimacy and administrative procedures for Project activities;
- Borderland regime in the project implementation areas; requirements to obtain necessary permits and perform necessary procedures.

#### **7.1.4 Environmental Aspects**

- Low stability of tundra and coastal-marine ecosystems.

#### **7.1.5 Social Aspects**

- Qualification of personnel engaged in the project implementation;
- Living and labour conditions of personnel.

## 7.2 MAIN RISKS AND MITIGATION MEASURES

### 7.2.1 Key Risks

Below are the key risks related to potential implementation or non-implementation of the Project and capable of influencing the outcomes of the Project:

#### *Financial and economic risks:*

- Lack of interest of identified potential donors;
- Withdrawal of one or more sponsors from the Project;
- Impossibility to meet the project implementation schedule.

#### *Technical risks:*

- Impossibility to reach the target areas;
- Breakdown of equipment, vehicles and mechanisms;
- Personnel sickness and accident rates;
- Changes in the logistical plans and, subsequently, the schedule of payments, deficit and of the original budget and unpredicted increase in the Project cost.

#### *Institutional risks:*

- Refusal of regulatory and supervisory bodies to grant a permit for the expedition and field works;
- Delays in the delivery of cargo during the preparation to the expedition and field works; delays in the removal of equipment and samples.

#### *Environmental risks:*

- Damage to the environment when travelling outside roads and conducting sampling works.

#### *Social risks:*

- Lack of qualified workforce among the permanent residents of the area;
- Extreme living and labour conditions caused by the remoteness and weather factors resulting in
  - failure to retain the required quality of work due to the human factor.

## 7.2.2 *Mitigation Measures*

The Project proposes the following measures aimed at mitigating the identified risks:

### *Financial and economic measures:*

- Consultations with a wide range of potential donors with due consideration of the geographic aspects of their financial assistance (conducted by ERM at the PINS preparation stage);
- Development and approval of acceptable time schedule of payments, elaboration of a procedure and timely adjustment of plans relating to financing of the Project;
- Expansion of the mechanisms of the public-private partnership and encouragement of involvement of national and foreign investors.

### *Technical measures:*

- Use of certified machinery and equipment;
- Compliance with procedures and technical requirements to the use of equipment, materials and chemicals;
- Retaining certified and licensed contractors for Project implementation;
- Retaining reputable design development organizations and contractors for preparation of Project design and engineering documentation and for supply of equipment;

### *Institutional measures:*

- Timely procurement of all necessary permits and documents;
- Establishment of stable relations with administrative, supervisory and regulatory authorities.

### *Environmental measures:*

- Compliance with all established rehabilitation procedures (mandatory reclamation of the area of works; compliance with design requirements to the disposal process); non-use of all-terrain vehicles outside temporary roads without a real need.
- Imposition of strict measures on personnel guilty of violating environmental requirements.

### *Social measures:*

- Retaining qualified personnel for the project implementation;
- Creation of optimal living conditions for personnel.

*PICTURES*



*Picture 1.1. Location of potential impact areas in the Eastern Sector of the Russian Arctic*