



**Preparation of regional pre-investment studies in the
Western sector of the Russian Arctic
Stage 5 of consulting services
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Improvement of oil waste management

Final Report

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Brief summary of the project

In the result of this project the program of actions will be proposed and mobile oily sludge treatment facility (capacity 1 m³/hr) in Murmansk region will be installed.

Total project cost is Euro 1,430,000.

During the initial contact with initiators in August 2009, the following donors expressed interest in this project: EVD and NEFCO.

The project has the potential to be a profitable project due to the expected generated income.

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List of abbreviations

APC - Approximately Permissible Concentration
 CBER - Council of the Barents Euro-Arctic Region
 CMEP - Center of monitoring and environmental pollution
 COPIP - Critical objects protection improvement plan
 CPP - Cogeneration Power Plant
 EDREEI - Executive Directorate of Russian Environment Enhancement Investment Programme
 ESRP - Emergency Situations Response Plan
 EVD – The Agency for International Business and Cooperation: a branch of the Ministry of Economic Affairs of the Netherlands
 FL – Federal Law
 FSI – Federal State Institution
 GD - Guiding Document
 GOU DPO GASIS – State Academy of professional development and enrichment
 HMU – Housing maintenance and utilities
 HOSDS - Hazardous Object Safety Data Sheet
 HSC – Hardware and Software Complex
 IE – Individual Entrepreneur
 IFC – International Finance Corporation
 IFTS - Inspectorate of the Federal Tax Service
 IPPC – Integrated Pollution Prevention Control¹
 IZA – Ambient Pollution Index
 KAZ - Kandalakshsky Aluminum Plant
 LLC – Limited Liability Company
 MES – Ministry of Emergency Situations
 MNR – Ministry of Natural Resources
 MPC – Maximum Permissible Concentration
 MUGMS - Murmansk Department of Hydrometeorology and Monitoring of Environment
 NDEP - Northern Dimension Environmental Partnership²
 NEFCO - Nordic Environment Finance Corporation³
 NP – Maximum recurrence of exceeding of MPC
 O&M – Operation and Maintenance
 of executive employees and investment experts
 OJSC – Open Joint Stock Company
 OKATO - All-Russian Classifier of Political Subdivisions
 OKFS - All-Russian Classifier of Forms of Ownership
 OKOGU – All-Russian Classifier of Government Entities and Administration
 OKOPF - All-Russian Classifier of Legal Organizational Forms
 OKPO - All-Russian Classifier of Businesses and Organizations
 OKTMO - All-Russian Classifier of Territories of Municipal Formation
 OSR - oil spill response
 OSRP - Oil Spill Response Plan
 PB - Polychlorinated Biphenyl PPE - Personal Protective Equipment
 PPP – Public-Private Partnership
 PSRISFO - Polar Scientific Research Institute of Sea Fishery and Oceanography
 SanPin - Sanitary Regulations and Standards
 SDW - Solid Domestic Waste
 SHS - Sanitary-hygienic Standard
 SI - Pollutant Standard Index
 SPA - Scientific production association

¹ Russian: Комплексное предотвращение и контроль загрязнений – *Translator's note.*

² Russian: Природоохранное партнерство Северное Измерение – *Translator's note.*

³ Russian: Экологическая Финансовая Корпорация Северных Стран – *Translator's note.*

Taxpayer ID – Taxpayer Identification Number
TRRC - Tax Registration Reason Code
ZATO - Closed Administrative-Territorial Entity

1 GENERAL PROVISIONS

1.1 Background

The project consists of the installation of a mobile oily sludge treatment facility in Murmansk region with a capacity of 1 m³/hr

The oily sludges are a complex multiphase heterogeneous medium of mixed and oxidized hydrocarbons (resins, asphaltenes, and paraffin), sand, humus, water, salts, and various chemicals used in the process of production, gathering and preparation of stock oil.

Increasing oil product freight turnover led also to an annual growth of oily sludge generation (The sludge is generated by cleaning of oil-fired reservoirs, oily rags and oil-fired grounds).

Most of the sludge is generated by the oil transport and power plants.

Oil-fired boiler houses and heat generation infrastructure which includes tank farms are the main heat generation sources for the needs of HMU and most of the enterprises in Murmansk Region. An estimated hundred thousand tons of dark oil products is continuously stored in the tank farms of Murmansk.

According to the preliminary data, it is estimated that 20-60 tons of oily sludges have been accumulated at the enterprises and organizations of Murmansk region. Over 10,000 tons of oily sludge, which require subsequent utilization, is annually generated at the same enterprises.

The numbers are rough estimates and more precise data is lacking.

According to the legal framework, the existing situation in Murmansk region requires the following from the enterprises:

A. Storing the “1-4 class of hazard” waste at the in-house production area for a 6 months period before transfer to an external organization with sufficient licenses for utilization of the particular waste.

B. . Storing the “1-4 class of hazard” waste at the in-house production area for a 6 months period before its subsequent treatment by a specialized organization.

C. Transfer of the “1-4 class of hazard” waste to an external organization.

Generally, the most favorable and cost efficient way to solve the problems generated oily sludge treatment is the case “B”, as it doesn’t require extra costs: building of storage facilities, procurement of specialized installments, obtaining of the additional permits, licenses etc.

However, irrespective of the option selected by an organization, the problem of oily sludge utilization remains unsolved, as there are no specialized sites or plants for treatment of this type of waste in Murmansk region.

Thus, the continuous accumulation, and therefore growth in oily sludge volumes is continuing at the enterprises and organizations of Murmansk region.

However, to confirm a technological approach currently selected (mobile unit, 1 m³/hr) for the oily sludge utilization in Murmansk region with its subsequent adoption it is necessary to carry out the detailed studies, which will allow determining the actual volumes of the accumulated oily sludges and their emplacement inside Murmansk region, take into account the possible growth in this volume, choose the type and capacity of the oily sludge utilization plant.

1.2 Possibility to reproduce project

Projects similar to this have not been implemented in Murmansk region before. However the problem of continuous accumulation of oily sludges and oily waters and soils as well as the necessity of setting up of their treatment capacities arose long ago. Implementation of the projects similar to this is crucial from the viewpoint of creation of the potential of oil spill elimination capacities within Murmansk region.

As Murmansk region is the area of active development of oil and gas resources, and Kola Bay is the key initial point of Russian oil transportation to the foreign markets by the Northern Sea Route (see figure above), duplication of oil pollution treatment projects is quite possible in the future.



Figure 1-1 Oil and oil products transportation scheme in the North-Western Region of Russia.

1.3 Participants and flow chart of project implementation

Project executor and coordinator (grantee) is Eco-Centre LLC (ООО «Эко-Центр»)

Key project co-executors:

- FSI Murmansk Center of Standardization, Metrology and Certification
- SI SPA (Scientific Production Association) Taifun (ГУ «НПО «Тайфун»).
- Rosprirodnadzor (Russian Federal Service for Supervision of Use of Natural Resources) in Murmansk region
- Rostekhnadzor (Russian Federal Service for Ecological, Technical and Atomic Supervision) in Murmansk region

- Administration of the port of Murmansk
- Energy Efficiency Center of Murmansk region

2 CHARACTERISTIC OF INITIATOR FACILITY AND ITS FINANCIAL STATUS

2.1 Details and brief characteristic of initiator facility

- Eco-Centre («Эко-Центр») Group of Companies;
- The North-Western Federal District, Murmansk region, Murmansk
- Address: 71 Tralovaya Str., Murmansk 183038
- Phone: (815-2) 687-006; Fax: (815-2) 687-025
- Management of the enterprise – Glazov Aleksandr Leonidovich (Глазов Александр Леонидович) – general director, Bakharev Vladimir Ilyich (Бахарев Владимир Ильич) – first deputy general director
- Bank details:
 - Taxpayer ID/ KPP code (tax registration reason code): 5190183158/ 519001001;
 - Account: 407 028 106 050 000 027 93
 - DnB NOR Monchebank LLC, Murmansk;
 - Cash account: 301018103000000007 09, RCBIC 044 705 709;
 - Phone: (815-2) 687-006

History of the enterprise:

Eco-Centre («Эко-Центр») Company was established in 2002.

By 2004 the unified group was formed and its object was to eliminate accidental oil and oil product spills in the territory and coastal area of Kola Peninsula, as well as to prepare normative documents in this area, first within Murmansk regional Centre of Emergency and Ecological Operations OJSC and within NavEkoservis LLC (ООО «НавЭкосервис») from 2007.

After introduction of the simplified taxation system it was decided to change the form of organization from Open Joint Stock Company MRCEEO «МРЦАЭО» to Limited Liability Company NavEkoservis («НавЭкосервис»).

As the group experience has been accumulating and the activity has been developing, a necessity arose to improve the system of management of activity types and raise proficiency level by types of services rendered.

As a new project organization, Eco-Centre LLC was set up in summer 2008.

In the beginning of 2009 an independent risk evaluation, including in the fire safety area, became one of the priority areas of development of the life safety activities within Russian Federation. In spring 2009 the PTB-Expert LLC (ООО «ПТБ-Эксперт») was formed. This company also entered the group of companies “Eco-Center” LLC. Independent risk evaluation in the companies and organizations of Murmansk region, including in the fire safety area, became the company’s main activity.

By today the group of companies “Eco-Center” LLC comprises the following 3 companies: NavEkoservis LLC (ООО «НавЭкосервис»), Open Joint Stock Company MRCEEO «МРЦАЭО» and PTB-Expert LLC (ООО «ПТБ-Эксперт»).

2.2 Legal status of facility

The Eco-Centre («Эко-Центр») Limited Liability Company is a Russian legal entity with private form of ownership.

Certificate of State Registration of legal entities under primary state registration number 1085190005086 issued by the Inspectorate of the Federal Tax Service (IFTS) in Murmansk.

Certificate of Registration of Russian Organization with the Tax Authority at its location within Russian Federation – IFTS of Russian Federation in Murmansk 5190 issued April 28, 2008, Taxpayer ID/ KPP code (tax registration reason code): 5190183158/ 519001001

Information on the types of economic activities, performed by the legal entity is as follows:

OKPO - 81096973
 OKOGU - 49014
 OKATO - 47401369000
 OKTMO - 477001000
 OKFS - 16
 OKOPF - 65

Company NavEkoservis («НавЭкосервис») which is part of Eco-Centre («Эко-Центр») Group of Companies has the following licenses:

1. Certificate for the right to conduct salvage and rescue operations in emergency situations (6-000-0137 of May 31, 2007);
2. License for carrying out activities with use of information classified as state secret.

At the present time the company prepares documents for obtaining of hazardous waste management license.

2.2.1 Interaction with the state authorities (or local self-government)

The activities of NavEkoservis LLC (ООО «НавЭкосервис») involve coordination of work with the following authorities:

- Chief Directorate of MES of Russia in Murmansk region;
- FSI AMN Murmansk;
- Chiefs of municipal formations. Chairman of the Committee of Emergency Situations (CES). ES GA (Emergency Situations Government Authority) Officers empowered by the administration of municipal formations of Murmansk region;
- FSI Murmansk Basin Emergency and Rescue Department;
- FSI State Marine Rescue Service;
- FSI Murmansk Center of Standardization, Metrology and Certification of the Federal Agency for Technical Regulation and Metrology of the Ministry of Industry and Energy of the Russian Federation
- Federal Service for Hydrometeorology and Environmental Monitoring State Institution Murmansk Department of Hydrometeorology and Monitoring of Environment;
- Federal Service for Supervision of Nature Resources, Department of the Federal Service for Supervision of Nature Resources (Rosprirodnadzor) in the North-Western Federal District;

The activities of Eco-Centre LLC (ООО «Эко-Центр») involve interaction with the following public authorities and scientific institutes:

- Department of Rosprirodnadzor in Murmansk region

- Directorate for Technological and Ecological Supervision (Rostekhnadzor) in Murmansk region
- FSI State Expertise in ES GA and fire safety areas of the MES of Russia
- FSI Centre of Laboratory Analysis and Technical Metrology
- Federal Service for Hydrometeorology and Environmental Monitoring State Institution Murmansk Department of Hydrometeorology and Monitoring of Environment;
- Federal Service for Supervision of Nature Resources, Department of the Federal Service for Supervision of Nature Resources (Rosprirodnadzor) in the North-Western Federal District, Division of Maritime Supervision (Murmansk region);
- Polar Scientific Research Institute of Sea Fishery and Oceanography after N.M. Knipovich (PSRISFO);
- Murmansk Marine Biological Institute of the Kola scientific centre of the Russian Academy of Sciences;
- Institution of the Russian Academy of Sciences Institute of Industrial Ecology Problems of the Kola scientific centre of the Russian Academy of Sciences.

2.3 Current state of production and sales of products, prospects of facility development

2.3.1 Current status

There are no specialized oil product waste utilization enterprises in Murmansk region. Such wastes are partially transferred to the boiler-houses and often burnt in-house, in furnaces and boilers.

There are several oily waters utilization enterprises operating in the region. The technologies applied for bilge and other oily water treatment are largely out of date and do not provide standard level of waste water treatment from oil products.

In the waste oil product acceptance and reprocessing enterprise Krondeks LLC (ООО «Крондекс») oil products are treated from the mechanical impurities and water in the separator and then, as a fuel oil transferred for burning in boiler-houses.

The acceptance of waste oils under the license is performed by Avtokolonna 1118 OJSC (ОАО «Автоколонна 1118»), GOUTEP (State Regional Unitary Heat and Power Enterprise) ТЕКОС (ГОУТЭП «ТЭКОС»), Murmansk CPP (Cogeneration Power Plant) OJSC (ОАО «Мурманская ТЭЦ») of Murmansk, Ivanov IP (individual entrepreneur) (ИП Иванов), Apatity.

There is no network of waste oil product acceptance (e.g. municipal) from small companies and vehicle owners in the region.

The acceptance and utilization of oily waters (incl. bilge waters) within the region is performed by oil transfer complex First Murmansk Terminal LLC (ООО «Первый Мурманский терминал») and MASKO CJSC (ЗАО «МАСКО»).

Technologies and equipment applied for oily waters treatment from oil products are out of date and do not provide standard level of waste water treatment from oil products.

There is an acute problem of utilization of solid waste containing oil products: sludges of oil-fired reservoirs cleaning, oil-fired grounds, oily rags etc. A considerable barrier to the solution of this problem is the necessity of use large amount of fuel for full thermal treatment of solid wastes and high cost of the installations. Some part of the solid wastes with oil products is

transferred to the domestic and industrial waste disposal sites, and thereafter – to the environment.

2.3.2 Characteristic of current production

Eco-Centre ("Эко-Центр") Group of Companies is engaged in the following activities:

1. Organization and performance of salvage and rescue operations, as well as maintenance of salvage and rescue preparedness in the organizations engaged in oil and oil product recycling in Murmansk and within Murmansk region.

The works are performed by specialists of NavEkoservis LLC (ООО «НавЭкосервис»). NavEkoservis LLC (ООО «НавЭкосервис») is a leader among companies engaged in maintenance of salvage and rescue preparedness within the territory, inland waters and coastal part of Murmansk region.

Within the period of 2007-2009 the company eliminated 9 emergency situations, organized and held exercises in over 39 companies and organizations all over Kola Peninsula, as well as 8 interdepartmental and international complex oil and oil product spill response exercises.

NavEkoservis LLC (НавЭкосервис) maintains salvage and rescue preparedness under the contracts with 68 companies and organizations located within all political subdivisions of Murmansk region.

2. Carrying out of environmental protection measures aimed at the improvement of ecological situation within Murmansk region.

The works are jointly performed by the specialists of NavEkoservis LLC (ООО «НавЭкосервис») and Eco-Centre LLC (ООО «Эко-Центр») and involve flood protection activities; riverbed clearing from sinkers; carrying out of analytical works aimed at improvement of the system of emergency situations prevention and response in the water area and coastal part of the Kola Bay; search and introduction of the best existing technologies of accidental oil and oil products spill response, introduction of biotechnologies for oily soils cleanup.

The works are performed within target programmes and with the assistance of the administration of Murmansk region (Committee on Ecology and Management of natural resources of Murmansk region), NPD (National Plan of Action for Protection of Marine Environment from Anthropogenic Pollution)- Arktika (НПД-Арктика).

3. Working out of project documentation in the spheres of environment protection and life safety, consulting, follow-up of expertise, coordination and approval of project documentation.

The works are performed by the specialists of Eco-Centre LLC (ООО «Эко-Центр»).

The works involve:

- Working out of normative documentation in the sphere of ecological and industrial safety;
- Working out of hazardous object safety data sheets (HOSDS), oil spill response plans

(OSRP), critical objects protection improvement plan (COPIP) and Emergency Situations Response Plan (ESRP);

- Modeling of emergency situations (technogenic and natural risks);
- Researches in the sphere of oily soils bioremediation and waste oil utilization technologies;
- Development and implementation of ecological projects.

All together the specialists worked out over 50 normative documents within the period of 2007 to 2009.

4. *Carrying out of independent risk evaluation*

Besides working out of normative documentation, the specialists of PTB-Expert LLC (ООО «ПТБ-Эксперт») plan to commence performing an independent risk evaluation in the sphere of fire safety, civil defence and population and territory protection from emergency situations of natural and technogenic character in the 4th quarter of 2009. PTB-Expert («ПТБ-Эксперт») company was set up in 2009 and joined the Eco-Centre LLC (ООО «Эко-Центр») Group of Companies.

The experts have wide work experience in prevention and elimination of emergency situations, take regular training and advanced training courses in the major Russian institutions.

Availability of continuing contracts for supply of services (as for the date of the present report preparation)

Eco-Centre LLC (ООО «Эко-Центр»)

- 2 government contracts concluded with the Committee of the Management of Natural Resources and Ecology of Murmansk region arising from the bidding for arrangement of accidental oil spill response volunteer training in Murmansk region;
- 7 contracts on the working out of accidental oil product spill prevention and elimination Plans, 3 of which is concluded with the state institutions and administrations of political subdivisions;

NavEkoservis LLC (ООО «НавЭкосервис»)

- The contract concluded with the Institution Executive Directorate of Russian Environment Enhancement Investment Programme for financing of pilot project “Development of technology of oily ground surface areas biological treatment in arctic conditions”.
- 69 contracts for maintenance of salvage and rescue preparedness, 13 of which are concluded with the state institutions, enterprises or administrations of political subdivisions;
- 12 mooring service supply contracts with commercial enterprises;
- 8 contracts with commercial enterprises for maintenance of salvage and rescue preparedness at oil product freight operations (bunkering);

PTB-Expert LLC (ООО «ПТБ-Эксперт») will commence work after the completion of accreditation procedure.

2.3.3 Marketing and sales system of the manufactured products

The company performs active research of the market of potential partners – OSR and oily sludge treatment equipment suppliers. In particular, the possibilities of purchase of oily sludge treatment mobile installations manufactured abroad, is considered.

2.3.4 Characteristic of the ecological monitoring system (service) of facility

Eco-Centre LLC (ООО «Эко-Центр») activities as such involve monitoring of ecologically hazardous objects of Murmansk region, areas which are highly sensitive to oil spills. Besides, the company made the observations of oily soils bioremediation site and is going to continue the researched within the framework of this project.

2.3.5 Human resources policy

The company adheres to the unified principle of staff service operation in relation to all the companies inside the Eco-Centre («Эко-Центр») group. People are the main resource and effective staff management is the key to success of the enterprise.

Having its staff policy in compliance with ISO 9001 and recommendations of ISO 9004, Eco-Centre LLC (ООО «Эко-Центр») is guided by the principle of “resource” approach, according to which the strategic purpose of the staff policy of the enterprise is enhancement and rational use of the staff resources.

To achieve the objective in view the management of Eco-Centre Group of Companies (ООО «Эко-Центр») set the following tasks:

1. Maintaining of the number of employees according to the manning table of each company of the group;
2. Enhancement of staff professionalism, education and training;
3. Development of the motivation to work, achievement drive of an employee;
4. Maintaining of the staff sustainability and permanence, which is based on the work satisfaction;
5. Staff development: training, reserve training, staff assessment;
6. Maintaining of high level of corporate culture and favorable social climate;
7. Observance of rights and insuring of social protection of employees in accordance with the requirements of new labor and pension legislation;
8. Maintaining of continuity of the staff work by means of systematic involvement of young employees, development of mentoring and enhancement of interaction with young people;
9. Performance of system-based work on improvement of staff labor conditions ;
10. Introduction of innovative programs for training, career development and expansion of jobs.

About 90% of the employees of the group of company are highly qualified specialists of higher, secondary and elementary level of professional education, who got educated in the best institutions of the country and region and have experience in the sphere of ecological and industrial safety assurance.

Within the framework of the tasks set, the employees of the companies of the Eco-Centre Group undergo system-based training and career development on the following areas:

Table 2-1 List of training courses undergone by the employees of the Eco-Centre Group of Companies

Topic of the training course	Document	Location	Year
“Working out of the section of emergency situations civil defence engineering measures in construction projects”	Certificate	Moscow, GOU DPO GASIS	2007
“Introduction of the independent risk evaluation system in the Russian Federation”	Certificate	Moscow. Glavgosexpertiza (Chief Directorate of the State Expertise) of projects of the MES of the Russian Federation	2007
“Oil and oil product spill prevention and response”	Certificate	Moscow, GOU DPO GASIS	2008
“Hazardous waste management professional training”			2007
“Hazardous waste management professional training. Working out of waste generation standards and their emplacement limits”	Certificate. Diploma, Certificate	Saint-Petersburg, Integral («Интеграл»)	2008
“Special sections of design documentation: civil defence engineering measures, emergency situations prevention measures”	License	Saint-Petersburg. North-Western Institute of Advanced Training	2008
“Theoretical and practical exercises on handling of accidental oil spill response equipment”	Certificate	Finland	2005
“Special oil spill response training”	Certificate	Saint-Petersburg. Training centre of the State Marine Academy after Admiral S.O. Makarov	2006
“Carrying out of accidental oil spill response activities at industrial facilities, river water areas and inland waters”	Certificate	Saint-Petersburg, Non-state Educational Establishment Centre LARP (НОУ «Центр ЛАРП»)	2006

“Special respiratory and visual organs protective equipment handling elementary training”	Certificate	Murmansk, SI TSUS («ЦУС») of the Federal Border Service in Murmansk region, Murmansk, Murmansk Center of Scientific and Technical Information	2008
“Labor protection specialist training”	Certificate	FSI “Assosiation Rosinformresurs (Russian Information Resource)” («Объединение Росинформресурс») of the Ministry of Industry and Energy	2009

2.4 Characteristic of financial state of facility

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

3 DESCRIPTION OF ENVIRONMENTAL PROJECT

3.1 Introduction

The proposed system is designed to thermally remove hydrocarbons from contaminated soil and sludge. The recovered hydrocarbons utilized as oil for further sale or use. Part of recovered hydrocarbons is return for process heating. System can process various materials such as:

- Hydrocarbons contaminated soil (results of oil or fuel spillages, etc);
- Solid fraction after processing sludge from oil ponds or lagoons on centrifuge;
- Sediments from oil and bunker oil tanks;
- Spend catalysts used in oil refineries, etc.

The system can be supplied in two major configurations: mobile or stationary. Mobile system designed on two tracks and contains power generator which provides electric power required for system operation. System can be erected on site during 4-5 working days. Stationary unit will require external power supply connection and building for system set up. Both systems are explosion and fire proof. The system consists of several units. Major components include: material preconditioning unit, thermal extraction unit, environmental control unit and quench condensing scrubber. In order to process hydrocarbons contaminated soil and sludge's from oil ponds material, should be screened to remove large rocks and metal objects. In addition materials have to be mixed, to average hydrocarbons content. Material with following parameters can be process on Thermal-Desorber system:

- Hydrocarbons up to 25% (by weight);
- Water up to 30 (by weight).

Materials after processing have hydrocarbons level below 0.5% (by weight).

Mobile systems can be delivered with a throughput of up to 2 m³/hr.

It has been recommended to provide a mobile unit of 1 m³/hr. In case of larger capacities it is always possible to install more units.

3.2 Process Description

Incoming material processed on a material preconditioning unit, is placed in the live bottom feeder by a front end loader. The live bottom feeder has a variable speed drive and a pair of counter-rotating screws that meter and move material to the feed conveyors. System of screw conveyors feeds material into the indirect fired rotary kiln. The kiln is an externally heated rotating stainless steel cylinder. The solid material is conveyed through the kiln by slope and its rotation. The kiln shell is heated by the hot gases passing over its outside. The hot metal of the kiln shell then heats the solids as they contact it. During the process the water and hydrocarbons are vaporized from treated material. Material after thermal desorption process has extremely low residual concentration of hydrocarbons that allows safely disposal.

If concentration of hydrocarbons in feed material is in range 15%-25% (by weight) and water has specific content, then it is possible to run a process without external fuel. Feed material will be heated by burning extracted light hydrocarbons. If there are not enough vaporized gases to heat kiln then external fuel will be used. Heating feed material results in

hydrocarbons and water evaporating. The gases vaporized in the kiln are sent to the direct contact quench scrubber.

The quench scrubber cools, condenses, and cleans the gases. The gases that condense below operating temperature of the quench scrubber are absorbed and cooling by the scrubbing media (oil).

The remaining clean gases are sent to the kiln combustion chamber, and the hydrocarbons are burned. Processed material from the kiln removed by screw conveyor. Material is cooled during it is conveyed by discharge water cooled screw conveyor to 90-100°C. Processed material is collected in a self dumping container.

Processed material contains miniscule amounts of hydrocarbons and is environmentally safe, it can be reused in material preconditioning unit to achieve desired material characteristics or disposal, or can be farther processed (for example in briquette press).

3.3 Theory of Operation

Hydrocarbons extractions are achieved by heating feed material so the level of hydrocarbons becomes volatile and evaporate. Feed material may contain mixture of different hydrocarbons. Oil sludge is a mixture of mostly heavy hydrocarbons, which are thermal resistant. If centrifuge was used in first stages then light hydrocarbons will be extracted and mostly heavy hydrocarbons will be left in source material. Thus material after centrifuge (cake) contains mostly heavy hydrocarbons with high evaporation temperatures

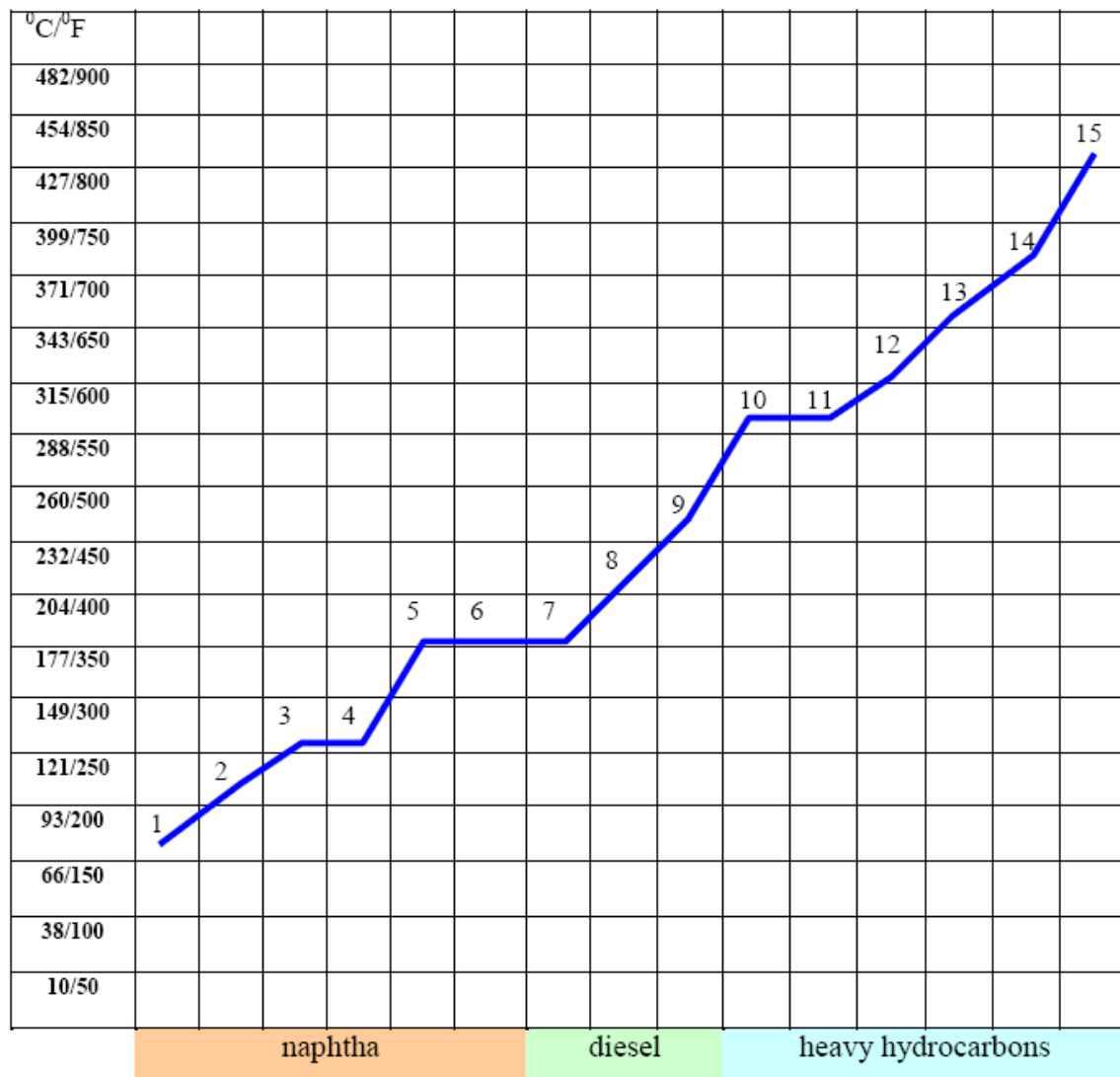


Figure 3-1. Hydrocarbons characteristic evaporation temperatures (C/F)

- | | |
|--------------------|----------------------------|
| 1 - gas | 8 - kerosene |
| 2 - toluene | 9 - diesel (90%) |
| 3 - ethyl benzene | 10 - low temperature PCBs |
| 4 - xylene | 11 - pirene |
| 5 - phenol | 12 - high temperature PCBs |
| 6 - gasoline (90%) | 13 - paraffin wax |
| 7 - naphthalene | 14 - asphalt |
| | 15 - tar |

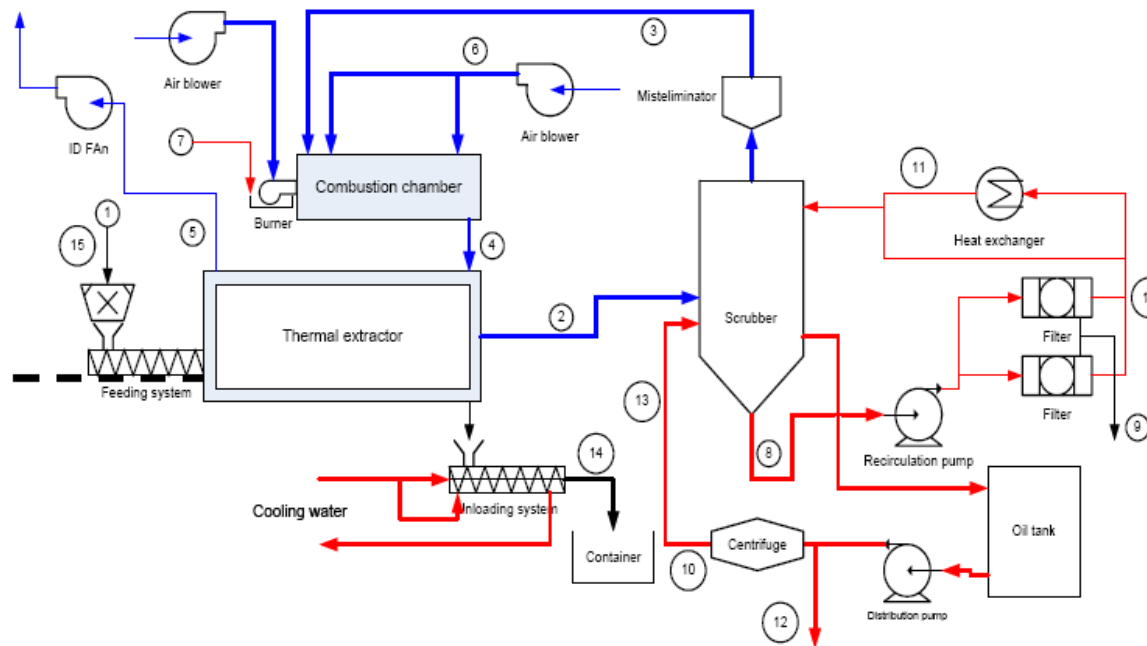
Thermal-desorber system should provide:

- Feed material heating to required temperatures;
- Required material residence time to evaporate all hydrocarbons contained in the feed material;
- Low oxygen level (partial vacuum) to prevent burning of hydrocarbons inside process vessel.

The proposed thermal-desorber system performs near full hydrocarbons extraction from feed material. To prevent hydrocarbons burn out inside the process kiln, a low negative pressure is maintained by a fan. The induced draft fan forces the vent gas flow through a scrubber system where the vent gas is cleaned.

The extracted material is combusted in the combustion chamber.

The system looks schematically as follows:



- | | |
|----------------------------------|------------------------|
| 1 – feed material | 9 – sludge from filter |
| 2 – vent gases | 10– clean oil |
| 3 – cleansed vent gases | 11 – cooled oil |
| 4 – hot gases to heat kilns drum | 12 – excess oil |
| 5 – exhaust gases | 13 – fresh oil |
| 6 – air for blower and quenching | 14 – cleaned material |
| 7– fuel (diesel, natural gas) | 15 – lime (optional) |
| 8 – dirty oil | |

Figure 3-2. Flow diagram

Feeding system

Feed material (cake after centrifuge, oil sludge or contaminated soil) is placed in the live bottom feeder. The live bottom feeder has a variable speed drive and a pair of counter-rotating screws that meter the material to the feed transfer conveyor.

The feed transfer conveyor is an inclined tubular screw conveyor that transfers the material from the live bottom feeder to the feed injection screw conveyor. The feed injection conveyor is a special tubular screw conveyor with a pair of external bearings and a cantilever drive shaft. It is designed to allow the conveyed material forms a seal to keep air out of the process. The feed injection conveyor feeds the material into the indirect fired rotary kiln.



Figure 3-3. Example of feeding system

Thermal Extractor and combustion chamber

The system is indirect heated thermal extractor unit. Feed material is heated during contact with hot kiln shell which is heated by hot gases generated in combustion chamber. Rotated kiln drum is equipped with mechanical system that prevents material build up and agglomeration inside the kiln. In addition, mechanical system increases heat transfer and material mixing which provide better extraction of hydrocarbons from material. Processed material is unloaded at the unloading hood by a screw conveyor. Special designed hoods and conveyors gaskets prevent air from entering inside kiln which as a requirement for indirect firing kiln. By eliminating oxygen inside the kiln, the reaction is limited to the vaporization of the water and hydrocarbons. Kiln drum is insulated by high quality ceramic fiber that resulted in low system weight and high system mobility.

Part of the gases extracted from feed material and not condensed in the scrubber, are burned in combustion chamber, lowering fuel consumption of the system. The gases vaporized in the kiln are sent to the direct contact quench scrubber. There they cool, condense, and clean. The gases that condense below operating temperature of the quench scrubber are recovered in the scrubbing media (oil). The heavy hydrocarbons and the particulate are captured in the oil.

Quench condensing scrubber

The scrubber consists of a vertical carbon steel vessel with multiple spray nozzles. The gas flow is counter-current to the oil flow. The oil is recirculated by a special low inlet head pump capable of handling hot oil. Dual parallel mist eliminators are provided to prevent liquid carry-over into the combustion chamber. A two stage filter system removes particulate from the oil. During system operation oil volume is constantly growing (depending on hydrocarbons content in feed material). Part of gases extracted from source material and not condensed in scrubber are burned in combustion chamber lowering fuel consumption of the system.

Excess oil is flowing from the scrubber through loop seal to oil collection tank. From collection tank oil is pumped to centrifuge which removes particulate from the oil and adds clean oil to the scrubber. Dual parallel mist eliminators are provided to prevent liquid carry-over into the combustion chamber.



Figure 3-4. Example of scrubber

Unloading and cooling system

Unloading system consist of inclined tubular screw conveyor. Conveyor have water cooled jacket and tubular shaft. It is designed that the ash forms a seal to prevent air from entering into the process.



Figure 3-5. Unloading and cooling system

The process will be PLC controlled. Parameters to be included in the control system are the combustion control temperature, kiln plenum temperature, oxygen level in combustion chamber, kiln vent gas temperature and exit temperature, scrubber oil and vent gas temperature.

3.4 Characteristic of the area, resources and infrastructure used for investment project implementation

3.4.1 Layout of the area of project implementation:

The project will be realized in the territory of Murmansk region; namely in the process of inventory it will involve main places of oil sludges accumulation (enterprises, storage capacities, warehouses, CPP, and ports. (Refer to the map in the Figure 3-1)
The unit is mobile and can be installed were appropriate.

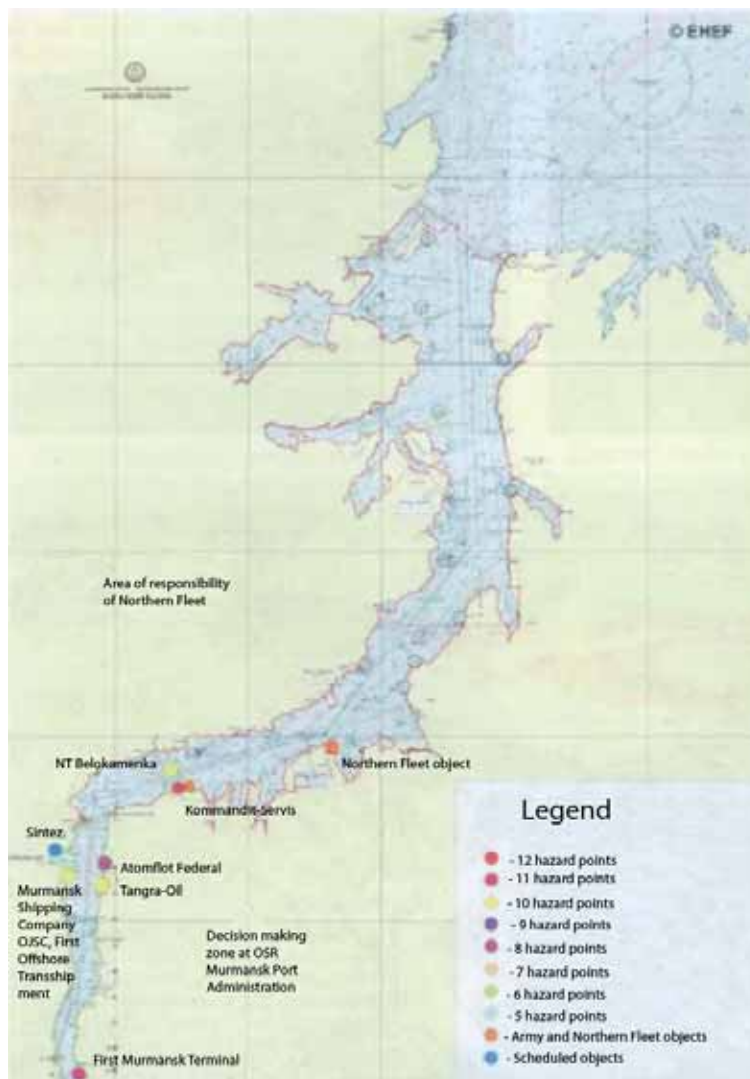


Figure 3-6 The map indicating environmentally hazardous objects in Kola Bay

3.5 Schedule of program implementation

If the initiator receives financing, the program will be implemented in the period of 6 months, which is mainly the delivery time of the mobile unit. .

3.6 Expected results from project implementation

As a result of this project, the oily sludge , oily water and even soil polluted with oil can be processed and cleaned. The recovered oil can be reused, and the treated water can be discharged again to surface waters.

4 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Description of current state of environment at the area of project implementation

The Project will be implemented in Murmansk Region. The Murmansk Region is one of the largest and most developed regions of the European North of Russia. The region is located in the Kola Peninsula. Most of its territory lies within the Arctic Circle. With the area of 145 thousand sq. km, the region represents a unique combination of abundant natural landscape, cultural and historic environment and developed economy. Advantageous geographic locations, significant natural resource potential, ice-free sea port, and proximity of the borders with the EU countries are the key factors of social and economic regional development.

The Murmansk Region has significant advantages compared to other Russian regions. This happens mostly because of its geopolitical and geographic location. The Murmansk Region is the northern gate of Russia; it links Russia with the European countries and handles huge cargo flow from our country and back.

Various natural resources exist in the region. More than 60 major fields of various minerals have been discovered in the Kola Peninsula area. Currently, nearly thirty types of fossils are produced; the most precious minerals are phosphor ore, titanium iron, aluminum, copper, nickel, zirconium, and other rare metals. The reserves of mica, ceramic raw material and raw materials for construction, facing stone, semi-precious and ornamental stones are extensive.



Figure 4-1 Murmansk Region map

Superb oil and gas reservoirs have been discovered in the Barents Sea in the last ten years. Shtokman gas and condensate field, with the reserves of 3.0 trillion cubic meters (tcm) of gas, is one of them. Development of such a unique field will satisfy the gas needs of the entire North-West of Russia for many years.

The economy of the Murmansk Region is targeted to the natural resources. The region delivers 100% of the Russian production of apatite concentrate and 12% of iron ore concentrate, 14% of refined copper, 43% of nickel, 14% of the fish production.

Natural and climate conditions in Murmansk Region, as well as complex physical and geographic situation often cause natural disasters, the most typical of them are:

- storm winds with the speed of 30 m/s and more;
- heavy snow storms (with wind speed up to 20 m/s during 12-15 hours);
- snowfalls (with average daily amount of 40 mm);
- frost (with the ambient temperature less than 40 C during more than 3 days);
- heavy ice-covered ground (wire icing of more than 20 mm);
- avalanching in mountains;
- forest fires.

Almost all Murmansk region is located in an unfavorable climate zone, which causes certain issues in operation of industrial and transport organizations.

Heavy wind storms, snow storms, snowfalls are typical for the coastal area of Cola Peninsula all year.

This zone comprises all restricted admission territories, such as: Polyarny, Snezhnegorsk, Skalisty, Ostrovnoy, Zaozersk, Zapolyarny, as well as cities of Severomorks and Murmansk.

Air

The main cause of air pollution is industrial emissions of hazardous substances. Steel making factories and non-ferrous production plants contribute to air emissions at the rate of 60%. The main stationary sources of the emission in the Cola Peninsula are industrial enterprises as: JSC "GMK "Pechenganikel" (Nikel and Zaplyarny), JSC "Severonikel Factory" (Monchegorsk), mining and concentration complex "OLKON" (Olenegorsk), JSC "Kandalakshsky Aluminum Plant" (Kandalaksh), JSC "Apatit" (Apatyty), power generation plants, boiler houses. Significant input in air pollution of city areas is done by automotive and railroad transport.

In atmosphere air emission of industrial enterprises are exposed by a complex of meteorological factors, which influence the existing level of the pollution. The dispersion of pollutants in Cola Peninsula mainly depends on active cyclonic activity with moderate or heavy winds. North-West of RF European part is categorized as favorable area for air pollution dispersion.

At anti-cyclonic season with weak winds and lowed inversions with gauzes in cities and industrial centers of Murmansk region increased level of pollution concentrations can be observed. High pollution (with maximum single concentrations of pollutants above 10 MPC) of the city air has not been observed. The most single concentrations of sulfur dioxide have been recorded in Nikel (3.5 MPC), nitrogen dioxide - in Murmansk (2 MPC) and carbon oxide in Monchegorsk (2.2 MPC).

The established standard for air quality assessment is MPC – maximum permissible concentration. Based on this standard other characteristics can be calculated: SI – standard Index – the maximum detected concentration of any pollutant in the city, divided by MPC.

NP - Maximum frequency of MPC increase %;

IZA - Ambient pollution index.

- The pollution level is considered to be increased if IZA is 5-6, SI < 5, NP < 20%;
- The pollution level is considered to be high if $7 \leq IZA \leq 13,5$, $SI < 10$, $20\% < NP < 50\%$;
- The pollution level is considered to be very high if $IZA \geq 14$, $SI > 10$, $NP > 50\%$.

Based on the atmosphere pollution observation data the assessment of air pollution level in the settlements and towns of Murmansk Region was performed (Table 4-1).

This assessment allowed to determine the towns of Murmansk region, where mean year concentration of pollutants is \geq MPC, the largest single pollution indices are introduced – PSI and the maximum frequency of exceedence of MPC by any substance in the town (tables 4-1).

Table 4-1, Indices of ambient air pollution in the area of Murmansk UGMS activities in 2008 (Source of information – Report on environment safety and rational use of natural resources of Murmansk region in 2008).

City	IZA (5)	Contaminants	SI	NP	Pollution level
Apatity	1,1	Suspended substances	1,4	2,0	Low
		Sulfur dioxide	<0,1	-	
		Carbon oxide	1,2	1,6	
		Nitrogen dioxide	0,4	-	
		Benzopyrene	1,1	-	
Zapolyarniy	2,2	Suspended substances	0,8	-	Low
		Sulfur dioxide	3,2	10,0	
		Carbon oxide	0,4	-	
		Nitrogen dioxide	0,4	-	
		Formalin	0,7	-	
Kandalaksha	2,0	Suspended substances	1,6	7,4	Low
		Carbon oxide	0,7	-	
		Poorly soluble nonorganic fluorides	0,5	-	
		Hydrogen fluoride	1,5	2,6	
		Benzopyrene	2,1	-	
Kirovsk	-	Suspended substances	0,8	-	Low
		Sulfur dioxide	0,1	-	
		Carbon oxide	0,8	-	
		Nitrogen dioxide	0,4	-	
Cola	3,0	Suspended substances	0,6	-	Low
		Sulfur dioxide	0,4	-	
		Carbon oxide	1,4	1,3	
		Benzopyrene	0,7	-	
		Formalin	0,5	-	
Monchegorsk	5,0	Suspended substances	1,0	-	High
		Sulfur dioxide	1,6	1,6	
		Carbon oxide	1,8	1,2	
		Benzopyrene	3,5	-	
		Formalin	0,8	-	

Murmansk	4,0	Suspended substances Sulfur dioxide Carbon oxide Phenol Formalin	0,6 1,6 1,3 1,9 1,0	0 4,2 1,3 4,9 -	Low
Nikel	4,0	Suspended substances Sulfur dioxide Carbon oxide Formalin Benzopyrene	1,0 3,7 0,7 0,7 0,6	- 18,8 - - -	Low
Olenegorsk	-	Suspended substances Sulfur dioxide Carbon oxide Nitrogen dioxide	1,2 <0,1 0,8 0,7	1,4 - - -	Low

Taking into consideration these standard characteristics the air quality of air pollution was performed in Murmansk region. The cities where average pollutants concentration ≥ 1 MPC were defined.

Table 4-2 Indices of ambient air pollution of the towns of Murmansk region in 2008 (Source of information – Report on environment safety and rational use of natural resources of Murmansk region in 2008).

City	Ambient pollution index (IZA)	Standard index (SI)	Maximum frequency of MPC increase % (NP)	Average annual ≥ 1 MPC
Zapolyarniy	2,2	3,2	10,0	1,0 MPC (sulfur dioxide) 1,0 MPC (formalin)
Cola	3,0	1,4	1,3	1,3 MPC
Monchegorsk	5,0	1,6	1,6	3,0 MPC (formalin) 1,2 MPC (benzopyrene)
Murmansk	4,0	1,9	4,9	1,7 MPC (formalin)
Nikel	3,0	3,7	18,8	1,1 MPC (sulfur dioxide) 1,7 MPC (formalin)
Olenegorsk	-	1,2	1,4	1,2 MPC (suspended substances)

In 2008 based on the observation data the content of pollutants in the ambient air, expressed in terms of API, is low. There were some occasional pollution detection on certain pollutants mainly in the 30-40 km zone of the main industries.

Waste

Generation of hazardous wastes of 1-4 hazard class decreased by 36.9% in 2008 in comparison with 2007 and made 288,400 tons.

Use and processing of hazardous wastes decreased in comparison with the previous year and made 199,900 tons (69,300 from waste generation).

Quantity of waste burials increased by 14.6% in comparison with 2007 and made 197,700 tons.

Actual quantity of generation, use, processing and allocation of consumer and production wastes in Murmansk region in 2008.

Table 4-3 Actual quantity of generation, use, processing and allocation of consumer and production wastes in Murmansk region in 2008 (Source of information – Report on environment safety and rational use of natural resources of Murmansk region in 2008).

Types of waste	Generation, tons	Use, processing, tons	Burial, tons
1 class	63,3	98,2	0,000
2 class	91,3	31,1	0,000
3 class	85793,2	61625,7	2433,3
4 class	202448,8	138209,9	194297,0
5 class	203352400,6	51183969,9	152128494,4
Total amount	203640797,2	51383934,8	152325224,7

About 90,000 tons of waste per year is incinerated at the incineration plant of Murmansk. There are no landfills equipped according to the up-to-date environmental requirements in Murmansk region. There 19 so-called “authorized” landfills, 5 of them have 2 year remaining life; area occupied by the landfills is about 150 ha. There are over 40 unauthorized waste emplacement sites.

Waste regaining is ill-developed and concentrated mainly in Murmansk and Apatity.

Oil products waste management

According to the data provided by regional enterprises 2,693 tons of processed oil products and their mixtures emerged in 2008: processed engine, motor, diesel, industrial, transformer, compressor, turbine oils etc., as well as oil-contaminated emulsions, diesel fuel rests, floating oil separator films. Of this amount 1,845 tons (68.5%) were used or decontaminated. Most oil products are burnt at boiler houses and CPP. Insignificant part of processed oil waste is used by the enterprises themselves as lubricants for units and assemblies where it is possible to use low-quality oil products (for example, reducing gears).

At present there is no capacity or enterprises in Murmansk region for deep oil product waste processing and obtaining of marketable oil products.

At the waste oil product acceptance and reprocessing enterprise Krondeks LLC (ООО «Крондекс») oil products are purified of mechanical impurities and water in a separator and thereafter handed over to be burnt at boiler houses as boiler fuel.

Processed oils are accepted in accordance with a license by Avtokolonna 1118 OJSC (ОАО «Автokolonna 1118»), GOUTEP (State Regional Unitary Heat and Power Enterprise) TEKOS (ГОУТЭП «ТЭКОС»), Murmansk CPP (Cogeneration Power Plant) OJSC (ОАО «Мурманская ТЭЦ»), Ivanov IP (individual entrepreneur) (ИП Иванов) from Apatity.

In the region there is no network for processed oil product acceptance (for example, a municipal one) from small companies, individual persons and motorists.

Oil-contaminated waste treatment

In the territory of the region acceptance and utilization of oily waters (including bilge waters) are carried out by oil transfer complex First Murmansk Terminal LLC (ООО «Первый Мурманский терминал»), MASKO CJSC (ЗАО «МАСКО»).

The technologies and equipment used to purify oily waters of oil products are out of date and no more provide waste water purification from oil products to the standard degree.

There is an actual problem of utilization of solid waste containing the following oil products: oil sludges of oil tank cleaning, mazut-contaminated sand etc. In the region there are no enterprises accepting such waste types for utilization.

Surface waters

There are more than 127 thousand hydro objects on the Kola Peninsula including 20,6 thousand stream flows, 107 thousand water reservoirs including lakes of Imandra, Umbozero, Lovozero, reservoirs at Tuloma, Voronya, Teriberka rivers. The region is very rich with water resources.

Regular monitoring of water reservoirs quality is carried out by Murmansk UGMS with frequency of 6-12 times per year at 55 regional rivers, lakes, springs and reservoirs.

It is very specific for the natural waters to include metal ions such as copper, iron and manganese. High concentrations of metals when no water discharge from industrial enterprises takes place can be observed in low-water season when feeding is primarily done by ground waters.

However industrial activity at Kola North leads to pollution of water reservoirs by sewage waters as well as by dust emissions coming to water with rainfall. High and extremely high water pollution levels by metals, sulfates, ditiophosphate, nitrogen and phosphorus compounds, organic substances are limited and can be observed in small water objects. Rivers Nadui (Monchegorsk) and Kolos-yoki (Nikel) are classified as chronically polluted water objects due to they are exposed to direct water discharge from non-ferrous metallurgy companies without sufficient treatment.

Soils

The main factors causing soil pollution are industrial and domestic waste as well as emissions from the industrial enterprises (aerogenic pollution).

Settlements of Murmansk region occupy 0.4% of the territory of region, agricultural lands – 0.2%; 8,950 ha are occupied for plough-lands for forage grasses production in comparison with 17,411 ha in 1990.

In accordance with the effective normative-legal acts: Federal Law “About sanitary-epidemiological safety of population” dated 30.03.1999 No. 52-FL with addenda and amendments, art. 21; SanPiN 2.1.7.1287-03 “Sanitary-epidemiological requirements as to soil quality”; GN 2.1.7.2041-06 “Maximum permissible concentration (MPC) of chemical substances in soil”; GN 2.1.7.2042-06 “Guiding permissible concentration (GPC) of chemical substances in soil” – the control of observance of requirements of sanitary legislation as to soils, maintenance of territories of urban and country supplements, accomplishment of measures on prevention of soil pollution.

In year of 2008, the soil examinations were carried out on all administrative territories. As compared with 2007, specific weight of samples exceeded sanitary standard of the heavy metals' content in soil has been reduced.

The districts of region have been ranked taking into account K_{sum} – a summary index of soil pollution (Table 4-3). In accordance with the accomplished ranking, the territory of the Severomorsk ZATO takes the second place as to soil pollution grade.

Table 4-3 Ranking of region territories basing on soil pollution index (K_{sum})

Territory	Summary index of soil pollution K_{sum}
Kovdorskiy district	0,14
ZATO Polyarniy	1,23
Terskiy district	1,37
Apatity town	2,24
Kandalaksha town	2,27
Olenegorsk town	2,7
Kirovsk town	3,0
ZATO Skalistiy	3,02
Lovozerkiy district	3,62
ZATO Zaozersk	5,1
Monchegorsk town	6,0
the city of Murmansk	7,72
Kola District	10,32
ZATO Severomorsk	32,8
Pechengskiy district	45,92

The highest index of soil pollution has been registered in the industrial enterprises impact zone (Pechenega area, ZATO Severomorsk). In Murmansk the index of soil pollution mounts to 7.72; this is lower than the average rate in the region.

Demographic situation and population health

Demographic situation and population health in Murmansk region as well as in Russia in whole becomes worse and is determined by low birthrate and life expectancy, high death and sickness rate. For the year 2007 Region population decreased for 5902 people and by the 01.01.2008 it accounted 850 929 people (fig 4-2).

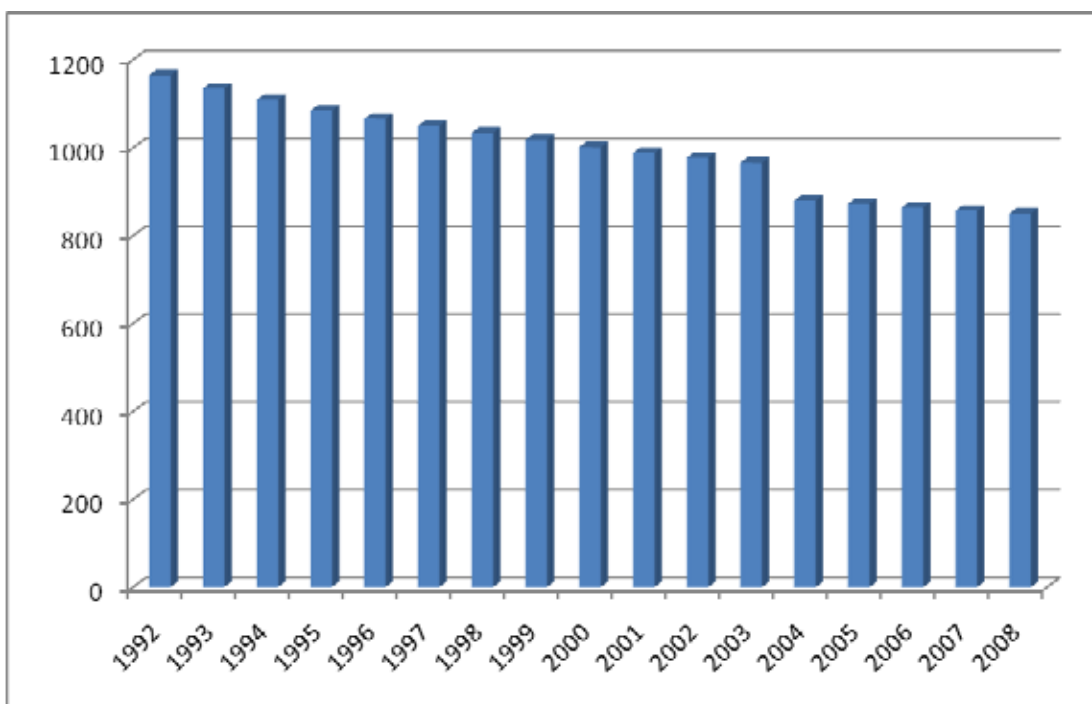


Figure 4-2 Population at the beginning of the year, in thousands

Children above 14 make 122,534 people (14.4%), persons over working age – 126,788 people (14.9%). There is a regressive type of age distribution formed and maintained in the region. Middle age of population in the region is 36.1 years.

Generally the Murmansk region has the same demographic modernization problems as other regions of the North-West Federal District:

- Decrease in population due to the high death rate and low birthrate;
- Ageing of population due to low birthrate and rising death rates at working age;
- High death rate at working age and subsequent large gap in male and female life expectancy, as well as decrease of general index of life expectancy

In the Murmansk region high death rate is primarily associated with premature mortality from circulatory diseases, high male mortality from the accidents, injuries and toxication, as well as high mortality from neoformations.

Basic reasons of population health level and demographic situation decrease still remain: social stratification and poverty, increase of unemployed people amount, unbalanced structure and quality of food, adverse working conditions of employees, negative ecological and natural climatic conditions.

According to data of Directorate of state population placement service in Murmansk region as of March 03, 2009 total unemployment accounted 14963 people (as of February 01, it was 13178 people). Level of the registered unemployment (to economically active population) amounted 3%.

Quantity of employees supposed to be fired in accordance with staff reduction, liquidation according to data of enterprises themselves amount 1998 people.

Quantity of employees being on unpaid vocation as of March 03 amounts 128 people. Those who are idle because of employer's fault – 305. As far as vacancies concern Severomorsk ZATO is in the third place in Murmansk region: in Murmansk (2944), Kola district (526), Severomorsk (368), Kandalaksha (240), Pechengskiy district (171).

4.2 Requirements of environmental legislation

The main principles of management in the system of oil waste treatment are:

- The priority of the environment protection for the sake of preservation of human life and health;
- Scientifically grounded combination of economic and environmental interests of the population;
- Establishing and implementation of low-waste and nonwaste operating procedures using oil (petroleum) products;
- Complex use of the existing oil waste processing plants;
- Compliance with the requirements of environmental regulations and health legislation, unavoidable responsibility for their violations;
- Control over the legal entities and natural persons' compliance with environmental security norms during oil waste management;
- Use of economical incentive mechanisms for the involving of oil waste in economic turnover;
- Free access to information from the sphere of oil waste management of persons whose interests can be affected during such activity.

List of legal acts in the field of oil product waste management

- Federal law dated June 24, 1998 No. 89-FL "On production and consumption waste"
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)
- Order of RF MNR (Ministry of Natural Resources) dated December 18, 2002 № 868 "On the arrangement of professional preparation for the right of working with dangerous waste"
- GOST (State Standard) 17.1.3.05-82 Nature protection. Hydrosphere. General requirements on protection of surface and subsurface waters from oil and oil product pollution, USSR Gosstandart (State Committee for Standardization, Metrology and Certification) decree No. 1243 dated March 25, 1982
- GD 52.10.243-92 Guidance on chemical analysis of marine waters
- Enactment of the Government of the Russian Federation Nr. 240 dated April 15, 2002 On the order of organization of actions connected with preventing and liquidation of spills of oil and oil products in the territory of the Russian Federation
- Letter of the RF Ministry of Natural Resources No. 05-23/29-729 dated March 9, 1995 "On purification of soils from oil and oil products"
- Enactment of the Government of the Russian Federation Nr. 613 dated August 21, 2000 "On urgent measures connected with preventing and liquidation of emergency spills of oil and oil products (with amendments as of April 15, 2002)"
- The European Union's IPPC directive (Integrated Prevention Pollution and Control)/BREF

4.3 Characteristic of sources and types of environmental impact

Possible impacts emerging in the process of project realization are summed up in Table 4-5.

Table 4-5 Possible impacts on environment and population arisen from project's implementation

Planned works: Impact on:	Operating of unit
Environment:	
Soils	Medium (negative)
Surface water	Medium (negative)
Underground water	Medium (negative)
Air	Medium (negative)
Wildlife:	
Flora	Weak (negative)
Fauna	Weak (negative)
Social and economic environment	
Forced resettlement	Neutral
Transport	Neutral
Economic development	Positive effect
Employment	Positive effect
Health and safety of population	Neutral
Health and safety of staff	Weak (negative)
Nature and culture heritage	Neutral

Impact level
Heavy (negative)
Medium (negative)
Weak (negative)
Neutral
Positive effect

Expected positive consequences

Environmental impact

Creation of capacity for decontamination will help to solve the problem of accumulated and emerging oil sludges, oily waters and soils in the region that will have positive impact on the ecological status of the region.

Social impacts

From the point of view of the to-be intensions on project realization on commercial scale the following items can be referred to social impact: organization of new working places, creation of a new direction in oil contamination treatment in the region, involvement of partners.

In the course of project realization negative impact on the environment and the population is inevitable. Possible negative impact is mainly connected with potential contamination by oil during the operation and maintenance works.

Description of negative impact on the environment and the population is summarized in the table below:

Table 4-6 Expected negative impact on environment and population

Processes	Possible impact on:	Description	Risk
Allocation of the contaminated wastes	Soils Vegetation Ground waters Staff safety and health	Impacts on soils, flora might be caused by the storage of the contaminated wastes Oil spills	Medium
Operation of unit	Staff safety and health	In the course of operation and maintenance work staff has direct contact to oil contaminated soils. That creates a possibility of negative impact connected with staff safety and health.	Medium

4.4 Measures for prevention of unfavourable environmental impacts of PROJECT implementation

Measures on impact prevention are listed in the table below.

Table 4-7 Impact to environment and staff caused by production processes and proposed measures

Production processes	Impact	Prevention /mitigation measures
Handling with the oily contaminated wastes	Soils Vegetation Ground waters Staff safety and health	The storage sites for the contaminated wastes should be properly equipped: e.g. by protective layer, marked Movements of oily wastes should be done only on specially prepared routes Staff should be provided with the personal protective equipment and trained

4.5 Draft of the List of environmental conditions

In the course of work under the project ecological requirements to the objects listed in short below shall be considered:

- Operation only at the specially equipped sites;
- Power and resource saving principles;

- Maintenance of occupational safety (compliance with safety requirements, maintenance of proper working conditions).

5 FINANCIAL EFFICIENCY OF INVESTMENT ENVIRONMENTAL PROJECT

5.1 Value and structure of investment to project

The capital expenses for this project are estimated:

Table 5-1 Budget for the project

Stage #	Cost items	Cost, thousand Rubles	Cost, euro
Stage 1	Procurement of mobile thermal – desorber	44,000	1,100,000
2	Auxiliary equipment	8,000	200,000
3	Development of the plan, Overhead expenses (15%)	5,200	130,000
	Total:	57,200	1,430,000

Auxilliary equipment are mainly tanker trucks or mobile tanks to transport and contain the treated materials.

5.2 Expected income of the project implementation

Economic effect from implementation of investment projects for the project initiator will be the gaining of profit from the oil product, oily waters and polluted soil treatment services; for the enterprises-creators of this type of waste – service cost reduction by means of reduction of the expenses for waste transportation to another regions.

Today the cost of treatment of oily sludges per cubic meter is 9 to 17,000 RUR. Half of this price consists of transportation expenses, as oily sludges are to be transported for processing to other regions. Such cost is too high for the producers of the oily sludges, which in their turn try to conceal the accumulated oily sludges.

However, the construction of oil sludge treatment enterprises in Murmansk region will result in reduction of utilization cost to 7-8,000 rubles per cubic meter which is quite affordable for the producers of oily sludges.

Therefore, the oily sludge producers will gain a direct benefit from providing of oily sludge (as well as oily water and soil) treatment services.

It is envisaged that the treatment of sludge shall be paid by the polluter. However at this stage it is unclear which fees would be applicable for such treatment. The project owner will have to negotiate contracts with the regular providers of the polluted materials, such as the port authorities, the navy, the industries and others.

The details of the transaction will than be negotiated in a contract.

6 PLAN OF FUNDING

6.1 Existing sources and conditions of project funding

Eco-Center receives funds through government institutes, polluters that need to pay for treatment and sometimes also from scientific and production centers for trainings. They have no experience with international donor funds.

Eco-Center representatives have been holding negotiations with Committee on nature resources and environment of Murmansk region regarding possibilities to get funding out of funds of regional budget.

As for the moment, the Committee assigned the task to solve the issue of accumulated oily sludge in Murmansk region. This task was also sounded in the panel session of the Committee on emergency situations in October 2009. In particular, in 2010 the Committee plans to develop a design project of treatment facilities for oily sludge.

As is evident from the mentioned above, the intentions of state organizations correlate with plans of Eco-Center and therefore have a high potential to interactions and namely at the level of public-private partnership (PPP).

However, at the stage of pilot project the concernment of state organizations to fund this project is estimated to be low. The public-private partnership fits more to industrial scale projects after development and proving of solutions on oil contamination in Mumansk region. Note, that in case of getting funding from donors, Eco-Center plans to apply compensating payments according to the Program of small business support.

Decision to develop this program was made by the Murmansk oblast Government Decree #74 dated from 22.02.2008 "On concept to optimize solid waste management in Murmansk region". The state client and the coordinator of this program was represented by the Committee of nature management and environment of Murmansk region (at present - Committee on natural resources and environmental protection of Murmansk region, focal point – Svetlana Bulatova, tel: (8152) 21 00 32).

It is envisaged that the full amount of 1,430,000 Euro has to be financed by a funding agency.



6.2 Viability of project at different options of additional funding employment from international investors – participants of UNEP/GEF Project

In August 2009 Royal Haskoning team conducted a number of interviews with representatives of the following organizations – potential donors of this project:

- European Bank of Reconstruction and Development
- International Finance Corporation
- EVD
- Council of the Barents Euro-Arctic Region (CBER)
- Northern Dimension Environmental Partnership (NDEP)
- NEFCO
- Committee of Nature Use and Environment of Murmansk region


The following donors expressed interest in this project: EVD and NEFCO.
Information on these organizations is summarized in the tables below.

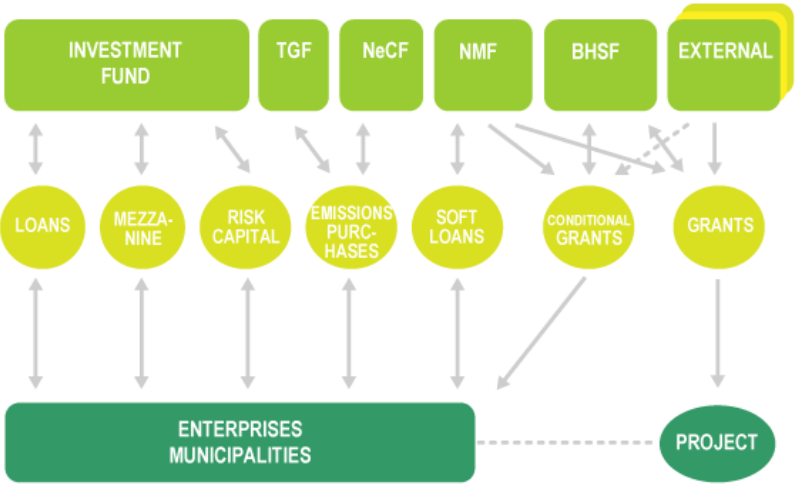
Table 6-1 Summary information on EVD

Name of funding agency	Agency for International Business and Cooperation of the Dutch Ministry of Economic Affairs. Acronym: EVD.
Logo of organization	 
Name of contact person/ respondent	Mr E. Smidt
Contact details of respondent	Tel. +31 (0)70 7788487, email: smidt@evd.nl. Address: PO Box 20105, 2500 EC, The Hague, The Netherlands
Programmatic priorities of funding agency	<ol style="list-style-type: none"> 1. Waste management and treatment 2. Waste water treatment 3. Reduction of air, water and noise pollution 4. Soil and ground water conservation 5. Energy saving <p>Others: Environmentally friendly building and development of sustainable goods and services</p>
Types of funds administered by agency:	<ol style="list-style-type: none"> 1. PSO(M) Environment 2. To-get-there 3. Dutch contributions to international financing institutes such as EBRD and IFC
Relevance for Russian project	PSO(M) Environment is highly relevant, To-get-there is not relevant and the Dutch contributions to international financing institutes are not very relevant since the project will need to deal directly with IFC and EBRD.
Type of assistance (grant, loan,):	PSO Environment Fund: Grant
Objectives:	The EVD supports programs in the field of sustainable economic growth in developing countries and emerging markets. These programs focus on innovative pilot projects, joint-investments and transfer of technology, knowledge and skills in social and economic sectors. This is achieved through business cooperation and through cooperation between business and training- and knowledge institutes. Local and international private companies are encouraged to invest and to play a role in economic growth and poverty reduction.
Eligibility criteria/ conditions:	PSO Environment Fund: The Russian project beneficiaries have to request for the project: the idea and motivation should come from Russia and not from Holland.
Average amount of funding per approved project:	PSO Environment Fund: 750,000 Euro
Information materials on fund:	PSO Environment Fund: Not in English: currently being developed.

Number of projects funded by fund during previous round:	PSO Environment Fund: 7. See for an example of a project funded in Russia: http://www.evd.nl/business/zoeken/showbouwsteen.asp?bstnum=160535&location=&highlight=PSO%20Environment
Total value of projects funded by fund during previous round:	PSO Environment Fund: 6 million Euro
Tips:	<ul style="list-style-type: none"> Given the amount of budget for some of the projects it was recommended to touch base with the main international financing institutes such as EU, IFC and EBRD. EVD has liaison persons for these institutes which can provide additional information for each of these institutes. EVD does have other funds that may be of interest for Russian Government, e.g. for bigger infrastructure projects, but these are loan based, e.g. the ORIO program.

Table 6-2 Summary information on NEFCO

Name of funding agency	Nordic Environment Finance Corporation (NEFCO)
Logo of organization	
Name of contact person/ respondent	Henrik G Forsström, Senior Adviser
Contact details of respondent	<p>Henrik G Forsström Senior Adviser NEFCO P.O. Box 249, FIN-00171 HELSINKI, FINLAND Office: Fabianinkatu 34 Telephone: +358 10 618 0638 Mobile: +358 400 888 541 (Russia +7 952 240 5405) Fax: + 358 9 630 976 E-mail: henrik.forsstrom@nefco.fi http://www.nefco.org</p>
Programmatic priorities of funding agency	<ol style="list-style-type: none"> 1. Water and sewerage 2. Cleaner technologies in industry 3. Waste 4. Renewable Energy & Energy Efficiency 5. Consultancy & Environmental services <p>Others: NEFCO targets all forms of environmentally hazardous emissions and discharges, such as greenhouse gases and toxic pollutant.</p>
Types of funds administered by agency:	<ol style="list-style-type: none"> 1. NEFCO Investment Fund 2. Nordic Environmental Development Fund (NMF) 3. Environmental Hotspots in the Barents Region (BHSF) 4. NEFCO Carbon Funds (TGF & NeCF)

	<p>5. Arctic Council Project Support Instrument (PSI) 6. Project Specific Funds</p> <p>Information on each of these funds can readily be obtained through: http://www.nefco.org/nefco/financing/</p> <p>NEFCO's funding resources (derived from http://www.nefco.org/introduction/funding_resources/):</p> 
<p>Type of assistance (grant, loan,):</p>	<p>NEFCO offers loans, subordinated loans and soft credits to enterprises and municipalities, for projects which aim at reducing environmentally hazardous emissions and discharges, such as greenhouse gases and toxic pollutants, within NEFCO's area of operation (Russia, Ukraine and Belarus, and the Baltic countries).</p> <p>NEFCO administers several funds and facilities that in certain cases can provide grants or other funding (such as carbon financing for JI projects under the Kyoto Protocol) for development and implementation of projects of particular benefit to the environment. NEFCO works within a network of partners including other IFIs, international and national organisations (such as the Arctic Council, Barents Euro-Arctic Council and the NPA-Arctic), bilateral and multilateral donors (including the Nordic governments, the EU and the NDEP). NEFCO may also enter into partnerships with local enterprises which carry out environmental projects in countries where it operates.</p> <p>Each project financed by NEFCO must fulfil certain environmental criteria and the reductions in emissions and discharges must be quantifiable. Each project application is carefully analyzed by NEFCO's legal advisors, investment managers and environmental experts.</p>
<p>Objectives:</p>	<p>The basic mission of NEFCO is to promote cost-effective ways to reduce the environmental pollution emanating from regions adjacent to the Nordic countries.</p>
<p>Eligibility criteria/ conditions:</p>	<p>Each project to obtain funding from NEFCO must meet number of environmental criteria including reduction of emissions and discharges. Every project application is to be thoroughly reviewed by NEFCO lawyers, investment managers and experts on environment</p>
<p>Average amount</p>	<p>N/A - NEFCO works with small and medium-sized projects (sometimes</p>

of funding per approved project:	through specialized facilities using intermediaries for smaller projects). NEFCO may provide up to 5 MEUR as an investment in a single project.
Information materials on fund:	Website www.nefco.org where information can be found and downloaded. Contact NEFCO's information department for paper copies and further information.
Contact person of found representative	Mr Amund Beitnes Investment Manager Telephone: +358 10 618 0658 Mobile: +358 50 311 3684 (Russia +7 921 165 9885) Fax: + 358 9 630 976 E-mail: amund.beitnes@nefco.fi
Tips:	NEFCO works within the framework of the Arctic Council and the Barents Euro-Arctic Council (BEAC). The Energy Efficiency Centers in NW Russia have long experience of working with NEFCO.

EVD indicated that they would not be interested to finance a feasibility study, but would prefer Eco-Center to select the technology they want to work with so that the project becomes an investment project. A disadvantage of EVD is that a relation with Dutch business needs to be secured and that their funding will only be available at the end of 2010. So, if NEFCO is more flexible than the project should be submitted first to NEFCO.

It should be noted that during communications was discussed the potential possibility of donors to provide funding for this project. Specific requirements towards the project as well as funding terms will be the subject to the future interactions between the project initiator and donors.

7 CONCLUSIONS

7.1 Brief conclusions

In the result of this project the program of actions will be proposed and mobile oily sludge treatment facility (capacity 1 m³/hr) in Murmansk region will be installed.

Total project cost is Euro 1,430,000.

The project has the potential to be a profitable project due to the expected generated income. Economic effect from implementation of investment projects for the project initiator will be the gaining of profit from the oil product, oily waters and polluted soil treatment services; for the enterprises-creators of this type of waste – service cost reduction by means of reduction of the expenses for waste transportation to another regions.

Environmental impact

Creation of capacity for decontamination will help to solve the problem of accumulated and emerging oil sludges, oily waters and soils in the region that will have positive impact on the ecological status of the region.

Social impacts

From the point of view of the to-be intensions on project realization on commercial scale the following items can be referred to social impact: organization of new working places, creation of a new direction in oil contamination treatment in the region, involvement of partners.

In the course of project realization negative impact on the environment and the population is inevitable. Possible negative impact is mainly connected with potential contamination by oil during the operation and maintenance works.

7.2 Major risks and uncertainties in connection with project implementation

The realization risks of the projects may include unreliability and inaccuracy of information obtained from enterprises and state organizations.

Partly this may be connected with the fact that enterprises where oil sludges are accumulated are unwilling to reveal real accumulation volumes. This fact will be the main obstacle for drawing up a proper database on oil sludges in Murmansk region that in its turn may set up conditions for choosing an improper sludge utilization mechanism.

It is possible to reduce the risks only with effective project support by state services of the Ministry of Natural Resources of the Russian Federation.

Appendix 1 Licenses of Eco-Centre

МЕЖВЕДОМСТВЕННАЯ КОМИССИЯ
ПО АТТЕСТАЦИИ АВАРИЙНО-СПАСАТЕЛЬНЫХ ФОРМИРОВАНИЙ,
СПАСАТЕЛЕЙ И ОБРАЗОВАТЕЛЬНЫХ УЧРЕЖДЕНИЙ ПО ИХ ПОДГОТОВКЕ

СВИДЕТЕЛЬСТВО

№ 002743

НА ПРАВО ВЕДЕНИЯ АВАРИЙНО-СПАСАТЕЛЬНЫХ
И ДРУГИХ НЕОТЛОЖНЫХ РАБОТ
В ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЯХ

« 31 » мая 2007 г. Регистрационный номер **6-000-0137**

Наименование формирования (службы) **Профессиональное аварийно-спасательное
формирование ООО «НавЭкосервис»**

Статус формирования (службы) **профессиональное**

Основные виды проводимых работ: **пп. 1,2,8,30а), 30б),30в)** (см. на оборотной
стороне)

Учредители формирования (службы) **ООО «НавЭкосервис»**

Адрес: **г. Мурманск, ул. Траловая, 71**

Основание: **решение Центральной аттестационной комиссии
транспортного комплекса Российской Федерации, акт от 31.05.2007 №23/М**

Действительно до **31 мая 2010 г.**

*Главный военный эксперт
МЧС России* **П.В. Плат**
*Председатель
аттестационной комиссии* **В.Б. Черток**

 М.П.
 М.П. **Ю.Ю. Семенова**
*Секретарь
аттестационной комиссии*

Издана и распространена ЗАО «Спектр» (лицензия №05-00-001803 МЭ РФ, серия В) тел. (095) 257 2432, 258 7011, г. Москва, 2003

Основные виды проводимых работ
(в соответствии с Приложением № 5 к «Квалификационным требованиям и методическим рекомендациям по проведению аттестации аварийно-спасательных служб, аварийно-спасательных формирований и спасателей»)

1. Разведка зоны чрезвычайной ситуации (состояние объекта, территории, маршрутов выдвижения сил и средств, определение границ зоны чрезвычайной ситуации).
2. Ввод сил и средств аварийно-спасательных служб, аварийно-спасательных формирований в зону чрезвычайной ситуации.
8. Организация управления и связи в зоне чрезвычайной ситуации.
- 30 а). Ликвидация (локализация) на море разливов нефти и нефтепродуктов (до 100 т).
- 30 б). Ликвидация (локализация) на внутренних водах (за исключением внутренних морских вод) разливов нефти и нефтепродуктов (до 500т).
- 30 в). Ликвидация (локализация) на суше разливов нефти и нефтепродуктов (до 500т).

Секретарь Межведомственной комиссии по аттестации аварийно-спасательных формирований, спасателей и образовательных учреждений по их подготовке



Т.В.Минина


 Управление Федеральной Службы Безопасности
(Федеральное лицензирующее ведомство)
 по Мурманской области

ЛИЦЕНЗИЯ

ГТ № 0016846
 Регистрационный номер 772 от 27 марта 20 09 г.

На осуществление работ с использованием сведений, составляющих государственную тайну
(осуществление секретного вида лицензируемой деятельности)

Степень секретности разрешенных к использованию сведений секретно

Виды работ (мероприятий, услуг) _____
(указывается в соответствии с перечнем работ, утверждаемым лицензирующим органом)

Лицензия предоставлена Обществу с ограниченной ответственностью "НавЭкосервис" (ООО "НавЭкс") ИНН 5116060270
(указывается полное и сокращенное наименование предприятия, учреждения или организации, осуществляющие правовые факты и лицензируемый вид лицензируемой деятельности)

Место нахождения 183010, г. Мурманск, ул. Траловая, д.71, офис 10
(указывается адрес места нахождения)

Место осуществления лицензируемого вида деятельности 183012, г. Мурманск, ул. Октябрьская, д. 3, оф. 20

Условия осуществления данного вида деятельности Согласно приложению, см. на обороте

Срок действия лицензии до 27 марта 20 14 г.

м.п. Подпись К.Н. Грицай (ф.и.о.)

Лицензия продлена до _____ г.
 м.п. Подпись _____ (ф.и.о.)

Сведения о регистрации лицензии на территории субъектов Российской Федерации _____

 м.п. Подпись _____ (ф.и.о.)

Гитман, МПФ, Москва, 2007, 461

ПРИЛОЖЕНИЕ

Осуществление данного вида деятельности допускается при условии:

- соблюдения требований законодательных и иных нормативных актов Российской Федерации по обеспечению защиты сведений, составляющих государственную тайну;
- обслуживания режимно-секретным подразделением общества с ограниченной ответственностью "ТехноЦентр сервис";
- наличия у общества с ограниченной ответственностью "ТехноЦентр сервис" действующей лицензии на осуществление мероприятий и (или) оказание услуг по защите государственной тайны.

Зам. начальника Управления ФСБ России
по Мурманской области



— К.Н. Грицай

Appendix 2 Financial statements of Murmansk Regional Centre of Emergency and Ecological Operations OJSC (ОАО «Мурманский региональный центр аварийно-экологических операций») and NavEkoservis LLC (ООО "НавЭкосервис") for 2006-2008

Table 1. Accounting balance sheet as of December 31, 2008 of Murmansk Regional Centre of Emergency and Ecological Operations OJSC (measurement unit - thousand roubles)

Assets	Index code	At the beginning of the accounting period	At the end of the accounting period
1	2	3	4
I. Fixed assets			
Property, plant and equipment	120 145	3 2	- 230
Total Fixed assets	190	5	230
II. Current assets			
Margin	210	26	-
including: raw materials, materials and other values	211	1	
Future expenses	216	25	-
Accounts receivable (that are due beyond 12 months)	240	1587	57
including: costumes and clients	241	1358	47
Short-term financial investments	250	149	68
Cash	260	88	10
Total Current Assets	290	1850	135
BALANCE	300	1855	365
III. Capital and reserves			
Equity	410	100	100
Retained profit (uncovered loss)	470	779	38
Total Capital and Reserves	490	879	138
IV. Long-term liabilities			
Postponed tax liabilities	515	1	1
Total Long-term liabilities	590	1	1
V. Short-term liabilities			
Payables	620	974	226
including: trade liability	621	582	150
payroll payable	622	105	35
Government non-budget organisations debts	623	-	8
taxes payable	624	265	12
other creditors	625	22	20

Total Short-term liabilities	690	974	226
BALANCE	700	1855	365

Table 2 Profit and loss account for the period from January 1 to December 31, 2008 of Murmansk Regional Centre of Emergency and Ecological Operations OJSC (OAO (measurement unit - thousand roubles)

Index		For the accounting period	For the same period last year
Name	Code		
1	2	3	4
Ordinary activity income and expenses Net sales proceeds from goods, works, services (less value added tax, excise taxes and similar mandatory payments)	010	15	14592
Pre-tax profit	020	(79)	(5216)
Administrative expenses	029	(64)	9376
Profit (loss) on sales	040	(897)	(7880)
Other incomes and expenses	050	(961)	1496
Other costs			
Profit (loss) before tax	090	22	-
Current profit tax	100	(31)	(284)
Net profit (loss) of the accounting period	140	(970)	1212
FOR REFERENCE: Constant tax liabilities (assets)	141	228	1

Table 3. Accounting balance sheet as of December 31, 2008 of NavEkoservis LLC (measurement unit - thousand roubles)

Assets	Index code	At the beginning of the accounting period	At the end of the accounting period
1	2	3	4
I. Fixed assets			
Capital investments	120	878	1178
Long-term investments	140	-	3
Total Fixed assets	190	878	1180
II. Current assets			
Margin including: raw materials, materials and other values	210	27	135
Future expences	211	21	135
Accounts receivable (that are due beyond 12 months) including: costumes and clients	216	6	-
	240	525	1771
Short-term financial investments			
Cash	241	245	1389
	250	56	56
Total Current Assets	260	2251	735

	290	2859	2697
	300	3737	3877
LIABILITIES			
1	2	3	4
III. Capital and reserves			
Equity	410	10	10
Retained profit (uncovered loss)	470	1813	2056
Total Capital and Reserves	490	1823	2066
IV. Long-term liabilities			
	590	-	-
V. Short-term liabilities			
Payables			
trade liability	610	38	-
payroll payable	620	1584	1174
	621	1259	625
other creditors	622	-	2
Government non-budget organisations debts	623	-	94
taxes payable	624	116	164
Payable to founders	625	209	289
Total Short-term liabilities	630	292	637
	690	1914	1811
BALANCE	700	3737	3877

Table 4 Profit and loss account for the period from January 1 to December 31, 2008 of NavEkoservis LLC (measurement unit - thousand roubles)

Index		For the accounting period	For the same period last year
Name	Code		
1	2	3	4
Ordinary activity income and expenses	010	17473	6312
Net sales proceeds from goods, works, services (less value added tax, excise taxes and similar mandatory payments)			
Pre-tax profit	020	(9661)	-
Administrative expenses	029	7812	6312
Profit (loss) on sales	040	(5886)	(4828)
Other incomes and expenses	050	1926	1484
Other costs	060	1	-
Profit (loss) before tax	140	1927	1484
Current profit tax	150	(491)	(214)
Net profit (loss) of the accounting period	190	1436	1270
FOR REFERENCE: Constant tax liabilities (assets)	010	17473	6312

Table 5. Accounting balance sheet as of December 31, 2007 of Murmansk Regional Centre of Emergency and Ecological Operations OJSC (measurement unit - thousand roubles)

Assets	Index code	At the beginning of the accounting period	At the end of the accounting period
1	2	3	4
I. Fixed assets			
Capital investments	120	4	3
Long-term investments	145	-	2
Total Fixed assets	190	4	5
II. Current assets			
Margin	210	77	26
including: raw materials, materials and other values	211	73	1
Future expences			
Accounts receivable (that are due beyond 12 months)	216	4	25
including: costumes and clients	240	1642	1608
	241	1453	1379
Short-term financial investments			
Cash	250	37	149
	260	136	88
Total Current Assets	290	1891	1871
	300	1896	1876
III. Capital and reserves			
Equity	410	100	100
Retained profit (uncovered loss)	470	(83)	779
Total Capital and Reserves	490	17	879
IV. Long-term liabilities			
V. Short-term liabilities	515	12	1
Payables	590	12	1
trade liability			
payroll payable	610	100	-
other creditors	620	1766	995
Government non-budget organisations debts	621	1259	582
	622	-	105
taxes payable	624	103	265
Payable to founders	625	404	43
Total Short-term liabilities	690	1866	995
BALANCE	700	1896	1876

Table 6 Profit and loss account for the period from January 1 to December 31, 2007 of Murmansk Regional Centre of Emergency and Ecological Operations OJSC (measurement unit - thousand roubles)

Index		For the accounting period	For the same period last year
Name	Code		
1	2	3	4
Ordinary activity income and expenses Net sales proceeds from goods, works, services (less value added tax, excise taxes and similar mandatory payments)	010	14592	9124
Pre-tax profit	020	(5216)	(3221)
Administrative expenses	029	9376	5903
Profit (loss) on sales	040	(7880)	(5769)
Other incomes and expenses	050	1496	134
Other costs			
Profit (loss) before tax	100	(284)	(85)
Current profit tax	140	1212	49
Net profit (loss) of the accounting period	141	1	(4)
FOR REFERENCE: Constant tax liabilities (assets)	142	11	(22)

Table 7. Accounting balance sheet as of December 31, 2007 of NavEkoservis LLC (measurement unit - thousand roubles)

Assets	Index code	At the beginning of the accounting period		At the end of the accounting period
		3	4	
1	2	3	4	
I. Fixed assets				
Capital investments	120	415		878
Long-term investments	190	415		878
II. Current assets				
Margin	210	21		27
including: raw materials, materials and other values	211	21		21
Future expences	216	-		6
Accounts receivable (that are due beyond 12 months)	240	1030		525
including: costumes and clients	241	1023		245
Short-term financial investments	250	186		56
Cash	260	71		2251
	290	1307		2859
Total Current Assets	300	1722		3737
III. Capital and reserves				

410	10	10
470	1050	1813
490	1060	1823
590	-	-
610	168	38
620	194	1584
621	1	1259
624	21	116
625	172	209
630	300	292
690	662	1914
700	1722	3737

Table 8. Profit and loss account for the period from January 1 to December 31, 2007 of NavEkoservis LLC (measurement unit - thousand roubles)

Index		For the accounting period	For the same period last year
Name	Code		
1	2	3	4
Ordinary activity income and expenses	010	6312	1386
Net sales proceeds from goods, works, services (less value added tax, excise taxes and similar mandatory payments)			
Pre-tax profit	029	6312	1386
Administrative expenses	040	(4828)	(814)
Profit (loss) on sales	050	1484	572
Other incomes and expenses			
Other costs	100	-	(1)
Profit (loss) before tax	140	1484	571
Current profit tax	150	(214)	(24)
Net profit (loss) of the accounting period	190	1270	547
FOR REFERENCE: Constant tax liabilities (assets)	010	6312	1386

Table 9. Accounting balance sheet as of December 31, 2006 of Murmansk Regional Centre Organization of Emergency and Ecological Operations OJSC (measurement unit - thousand roubles)

Assets	Index code	At the beginning of the accounting period	At the end of the accounting period
1	2	3	4
II. Fixed assets			
Capital investments	120	-	4
Long-term investments	145	14	-

	190	14	4
II. Current assets			
Margin	210	118	77
including: raw materials, materials and other values	211		73
Future expences	213	115	-
Accounts receivable (that are due beyond 12 months)	216	3	4
including: costumes and clients	220	1	-
	240	168	1642
Short-term financial investments			
Cash	241	30	1453
	250	-	37
Total Current Assets	260	341	136
	290	628	1891
	300	643	1896
III. Capital and reserves			
Equity	410	100	100
Retained profit (uncovered loss)	470	(107)	(83)
Total Capital and Reserves	490	(7)	17
IV. Long-term liabilities			
V.Short-term liabilities	515	-	12
Payables	590	-	12
trade liability			
payroll payable	610	95	100
other creditors	620	554	1766
Government non-budget organisations	621	314	1259
debts	624	136	103
taxes payable	625	104	404
Payable to founders	690	649	1866
Total Short-term liabilities	700	643	1896
Balance			

Table 10 Profit and loss account for the period from January 1 to December 31, 2006 of Murmansk Regional Centre Organization of Emergency and Ecological Operations OJSC (measurement unit - thousand roubles)

Index		For the accounting period	For the same period last year
Name	Code		
1	2	3	4
Ordinary activity income and expenses	010	9124	2463
Net sales proceeds from goods, works, services (less value added tax, excise taxes and similar mandatory payments)			
Pre-tax profit	020	(3221)	(587)

Administrative expenses	029	5903	1876
Profit (loss) on sales	040	(5769)	(1918)
Other incomes and expenses	050	134	(42)
Other costs			
Profit (loss) before tax	100	(85)	(32)
Current profit tax	140	49	(74)
Net profit (loss) of the accounting period	141	(4)	14
FOR REFERENCE: Constant tax liabilities (assets)	142	(23)	-

Appendix 3 Organization chart of bioremediation site

