СИБУР ТОБОЛЬСК-ПОЛИМЕР

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT of the Polypropylene Plant Construction Project (OOO Tobol'sk-Polymer) with a capacity of 500,000 t/y

Moscow, 2009

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LIST OF ABBREVIATIONS

BOD – Biological Oxygen Demand

Bq/kg - Becquerel per kilogram

CGFU - central gas fractionating unit

DDD - dichlorodiphenyldichloroetane

DDT – dichlorodiphenyltrichloroetane

DDE - dichlorodiphenyldichloroethylene

DMDS - dimethyl disulfide

DNBP - Di-N-butyl- Phthalate

EISA - Environmental and Social Impact Assessment

FCCW – Federal classification catalog of wastes

COD - Chemical Oxygen Demand

FGUP - federal state unitary enterprise

FZ – federal law

GDS - gas distribution station

GN - hygienic standard

GOST/OST – state/industry standard

GU TCGMS - State institution Tyumensky Center for hydrometeorology and Monitoring

ha - hectar

HCH – hexachlorocyclohexane

kJ– kilojoule

mcR/h - micro-roentgen per hour

MNR RF – Ministry for Natural Resources of the Russian Federation

MO - municipality

MPa – megapascal

MPC - Maximum Permissible Cocentration

MPE - Maximum Permissible Emissions

NRB- Radiation Safety Standards

PAH - Polyaromatic hydrocarbons

PP - Polypropylene

PS - polluting substances

RD – guiding document

SanPiN – sanitary regulations and norms

SN – building norms

SNiP - building norms and regulations

SP - code of practice

SPZ - sanitary protection zone

SS - Synthetic Surfactants

SSBT - occupational safety standards

TGK - territorial generating company

TNKKh - Tobol'sky petrochemical complex

TPC - Tentative Permissible Concentration

TPC/TPL - Tentatively Permissible Impact/Level

TPH – total petroleum hydrocarbons

TPP – thermal & power plant

TSIL - Tentatively safe impact level

TU - technical specifications

UIOs - Utilities, Infrastucture and Offsites UIOs

OOO – Limited liability company

INTRODUCTION

OOO "Branan Environment" has prepared this Report for the sole use of "Tobol'sk-Polymer" in accordance with Contract 170 TP dated 10.01.2008 under which the services were performed.

The conclusion and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from the third parties has not been independently verified by "Branan Environment", unless otherwise stated in the Report.

The work under the Contract was performed stage by stage. First, Environmental & Social Impact Assessment was made in pursuance of the Russian Federation legislation. In parallel with the ESIA preparation a Public Consultations' and Disclosure Plan (PCDP) was developed. Based on the ESIA results, public hearings on the Project were held and they showed a positive opinion of the public about the project implementation. The next stage of this work was the ESIA preparation in accordance with the international standards.

To assess the social issues' coverage, URS Corporation was subcontracted to perform a peer review and gap analysis of Tobol'sk-Polymer Social Baseline and Impact Assessment prepared by Belinda Ridley, Principal Social Consultant, and Nia Hughes Witcomb, Principal socioeconomist.

URS Corporation offers a range of professional planning, engineering and architectural design, environmental, construction, and program and construction management services. URS reviewed the below parts of the report:

- Section "Socioeconomic conditions of the area";
- Section "Assessment of potential impact of the project on the socioeconomic environment, infrastructure of the Rayon, land management and historical and cultural heritage".

URS's comments and proposals were taken into account in this report, to the extent possible, based on data availability.

If you have any questions on this report or require clarifications, please contact the below persons:

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1.0 MAIN LEGAL REQUIREMENTS

1.1 Provisions of International Treaties Signed by the Russian Federation

Mandatory priority requirements are part of international treaties and conventions (Article 5, par.2 of Federal Law No.101-FZ dated 15 July 2005 "On International Treaties": "Where an international treaty of the Russian Federation set forth rules other than those specified by the legislation, the international treaty rules shall apply").

The main international conventions ratified by the Russian Federation, the provisions of which shall be complied with, include

Persistent Organic Pollutants Convention (adopted on May 22, 2001 in Stockholm, Sweden, entered into force on May 17, 2004);The Convention aims at the continuing minimization and, where feasible, ultimate elimination of the production of all the persistent organic pollutants such as: DDT (dichloro-diphenyl-trichloroethane), aldrin, dieldrin, endrin, chlordane, mirex, toxaphene, heptachlor, PCBs (polychlorbiphenyl), HCB (hexachlorobenzene), PCDDs (polychlorinated dibenzo-dioxin), PCDFs (polychlorinated dibenzofurans). To-date, Russia is only a signatory of this Convention (22 May 2002), but failed to ratify it.

Convention on Long-range Transboundary Air Pollution (adopted 13 November 1979 in Geneva, Switzerland, became effective 16 March 1983) including the Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes (adopted in Sofia, Bulgaria, on 31 October 1988, became effective on 14 February 1991). This Convention is aimed at reducing emissions of pollutants, which may have negative impacts on the environment and man, and at their continuing reduction. The Convention is complemented with eight legally binding protocols defining commitments for complying with the maximum permissible concentrations of the specific air pollutants. To-date, Russia has signed only one Protocol, the Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes. The Protocol sets forth that nitrogen oxides or their fluxes levels should stay within the levels of 1987. The Protocol also regulates the critical loads concerning these substances and goals for the reduction of their emissions.

Convention on Environmental Impact Assessment in a Transboundary Context (adopted on 25 February 1991 in Espoo, Finland and became effective on 10 September 1997). This Convention lays down the right of the public to have access to information about the proposed projects and the related decision making. The public shall have an opportunity to take part in the procedures of environmental impact assessment, have access to the documents concerning the proposed project and comment them. Russia signed the Convention on 6 June 1991, but has not ratified it yet.

Convention on Transboundary Effects of Industrial Accidents (adopted on 17 March, 1992 in Helsinki, Finland and became effective 19 April 2000). The Convention provides for an opportunity of joint efforts of the Parties in preventing and responding

to transboundary accidents. The Convention sets forth that the Parties take the corresponding measures to prevent industrial accidents where possible, to reduce their frequency and severity, and to mitigate them. Russian signed the Convention on 1 February 1994 and ratified in on 19 April 2000.

Vienna Convention for the Protection of the Ozone Layer (adopted on 22 March 1985 in Vienna, Austria, and entered into forced on 22 September 1988) and the Montreal Protocol on Substances that Deplete the Ozone Layer (Adopted on 16 September 1987 in Montreal, Canada, and entered into force on 1 January 1989). The Vienna Convention for the Protection of the Ozone Layer lays down that the national policy of its signatories should be aimed at reducing negative impacts on the ozone layer of the Planet. The Montreal Protocol specified and complements the Convention defining that every subsequent period of 12 months the estimate consumption level of the control substances of polyhalogenocarbons in a specific country shall not be higher than the estimate level of its consumption in 1986. Russian signed and ratified both the Vienna Convention (signed on 2 March 1985 nd ratified on 18 June 1986) and Montreal Protocol (signed on 29 December 1987 and ratified on 10 November 1988).

The UN Framework Convention On Climate Change (UNFCCC, adopted on 14 June 1992 in Rio-De-Janeiro, Brazil, and became effective on 21 March 1994) and the Kyoto Protocol (adopted on 10 December 1997 in Kyoto, Japan, and became effective on 16 February 2005). The Convention binds the Parties to the Convention with commitments to reduced their emissions and to take measures to return to the emission levels that they had in 1990. The Kyoto Protocol to UNFCCC that set forth specific quantitative commitments for the reduction of GHG emissions for the developed countries and countries with transition economies including Russia.

Russia is also a member of the International Labor Organization (ILO) that regulates labor relations. The main conventions reflecting the main ILO principles in work safety and ratified by ILO (freedom of association and the right to collective bargaining, abolition on discrimination in labor relations, abolition of forced labor and ban on child labor) include:

- Forced labor:
  - C29 Forced Labor Convention (23 June 1956)[1];
  - C105 Abolition of Forced Labor Convention (2 July 1998);
- Freedom to associate:
  - C87 Freedom of Association and Protection of the Right to Organize Convention (10 August 1956);
  - C98 The Right to Organize and Collective Bargaining Convention Agreements (10 August 1956);
- Discrimination:
  - C100 Equal Remuneration Convention (10 August 1956);
  - C111 Discrimination (Employment and Occupation) Convention (4 May

[1] Date of ratification by the Russian Federation;

1961);

- Child labor:

    - C138 Minimum Age Convention (3 May 1979);
    - C182 Worst Forms of Child Labor Convention (25 March 2003).

1.2 Russian Legislation Requirements

Federal Legislation

The basic law in the Russian Federation is the Constitution of the Russian Federation. The Constitution of the Russian Federation of 12 December 2003 ensures the right of citizens in the Russian Federation to "… enabling environment, true and accurate environmental information, and to the compensation of damage caused to one's health or property by environmental violations" (Article 42).

The Constitution of the Russian Federation stipulates the division of powers in the area of environmental protection and subsoil use within the Russian Federation (Article 72). "The joint mandate of the Russian Federation and subjects of the Russian Federation include ownership, use, and disposal of land, mineral resources, management of natural resources, water and other natural resources, environmental protection and environmental safety, protected areas, protection of natural and historical sites

The main environmental and public health legal acts include:

- Federal Law # 7-FZ of January 10 2002 "On Environmental Protection". The law sets forth the legal basis of the environmental policy to ensure the balance between addressing socio-economic objectives and conservation of favorable environment, biological diversity and natural resources to meet the needs of the current and future generations, strengthen the environmental law and ensure environmental security.
- Federal Law # 52-FZ of March 30, 1999 "On Sanitary-Epidemiological Safety of Population" The Law sets forth the rights of citizens to health care and good environment.
- Federal Law # 68-FZ of December 21, 1994 "On Protection of Population and Territories from Natural and Man-Made Emergency Situations" sets forth common, for the Russian Federation, institutional and legal provisions for the protection of people, land, water and air space from emergencies.

The main legal acts governing various aspect of management and protection of the environment include:

- Federal Law # 96-FZ of May 4, 1999 "On Atmospheric Air Protection" sets forth the legal framework in the area of atmospheric air protection and is aimed at securing the constitutional rights of the citizens to favorable environment and true and accurate environmental information.
- The Water Code of the Russian Federation (Federal Law #74-FZ, March 03,2006) regulates the use and conservation of water bodies.

- Federal Law # 89-FZ of June 24, 1998 "On Industrial and Domestic Waste" regulates the handling of industrial and domestic waste for the purpose of preventing adverse impacts of the industrial and domestic waste on human health and environment.
- Federal Law # 52-FZ of 24 April 1995 "On Wildlife" regulates the protection and use of wildlife, conservation and restoration of wildlife habitats in order to ensure biological diversity, sustainable use of all the wildlife components, to promote its existence, to conserve the genetic stock of wild animals and to apply other approaches to the protection of wildlife as a vital element of nature.
- Federal Law #33-FZ as of 14 March 1995 "On Protected Areas" sets forth the systems of protected areas and details the pattern of their use and protection of gene pool.

Land use is regulated by the following legal acts:

- The Land Code of the Russian Federation (Federal Law dated 25 October 2001 #137-FZ) sets forth the legal basis for the use and conservation of land, provisions of the land law and land relations.
- The Civil Code of the Russian Federation, Part I (Federal Law dated 20 November 1994 #51-FZ) clarifies the essence of title to natural resources, divides the environmental and other mandates between the Russian Federation and its subjects and municipalities.

The main requirements to the design and construction of various facilities are reflected in the following documents:

- The Urban Development Code of the Russian Federation (Federal Law #190-FZ as of 29 December 2004) regulates relations including the environmental aspect thereof, arising from construction, capital repairs, and refurbishment of business facilities. The state expert review of the design documents and engineering surveys is conducted to assess whether the design documents meets the requirements of technical regulations including Sanitary Epidemiological Requirements, environmental standards, and requirements with respect to the state protection of cultural sites, as well as industrial, nuclear, radiation and other safety requirements, including requirements to the protection of the environment and operation of industrial facilities that is safe with respect to the human life and health.
- Federal law dated 27 December 2002 #184-FZ "On Technical Regulation" regulates relations arising from:
    - development, adoption, application and implementation of mandatory requirements to products or associated processes of the design (including development) of the production, construction, installation, set up, operation, storage, transportation, sale and recycling/disposal;
    - development, adoption, application and implementation of voluntary requirements to products or associated processes of the design (including development) of the production, construction, installation, set up, operation, storage, transportation, sale and recycling/disposal; and
    - assessment of compliance.

Regional Legislation of Tyumenskaya Oblast' and Tobol'sk Municipal Okrug

The Tyumenskaya Oblast' Charter was adopted by the Oblast' Duma on 15 June 1995. It was developed in accordance with the Constitution of the Russian Federation with the purpose of ensuring the rights and interests of those inhabiting Tyumenskaya Oblast'. It takes into consideration the natural, geographical, socio-economic, territorial and other specific features of Tyumenskaya Oblast' based on the need to organize effective governance, ensure and fully execute its mandate. It intends to strengthen its status as a subject of the Russian Federation and establish the legal framework of its comprehensive development.

The main environmental legal acts of Tyumenskaya Oblast' include:

- Law of Tyumenskaya Oblast' #302 dated 28 December 2004 "On Environmental Protection in Tyumenskaya Oblast'". The overall goal of the Law is to ensure good environment and establish the proper conditions for protecting the environment and vital interests of the Oblast' population from a adverse impacts that may be caused by economic and other activities, natural and technological emergencies, and their consequences. It also regulates the use and conservation of wildlife.
- Law of Tyumenskaya Oblast' #385 dated 03 March 2005 "On Regulation of Urban Development in Tyumenskaya Oblast'". In accordance with the Federal Law "On General Principles for the organization of Legal (Representative) and Executive Bodies of Power in the Subjects of the Russian Federation", the Urban Development Code of the Russian Federation, and other federal laws regulates the urban development activities in Tyumenskaya Oblast'.
- Law of Tyumenskaya Oblast' #303 dated 29 December 2004 "On Protected Areas in Tyumenskaya Oblast'". This Law regulates the establishment, protection, maintenance, use and governance of protected areas of regional importance. This Law covers all the categories of the protected areas of regional importance established in accordance with the federal and oblast regulatory and legal acts by either taking or not taking land plots from their owners, holders and users.
- Resolution of the Tyumenskaya Oblast' Government #67-pk dated 04 April 2005 "On the List of Species s to Be Recorded in the Red Data Book of Tyumenskaya Oblast'". In accordance with the Law of Tyumenskaya Oblast' #302 dated 28 December 2004 "On Environmental Protection in Tyumenskaya Oblast'" and Resolution of the Tyumenskaya Oblast' Administration #80 dated 23 April 1999, this Resolution adopts the list of animal, plant, and mushroom species s to be recorded in the Red Data Book of Tyumenskaya Oblast'.
- Resolution of Tobol'sk Administration #33 dated 07 September 2006 "On Approval of the By-Law on Procedures for Allocating Land Parcels to Individuals and Legal Entities within the Tobol'sk Municipality". In accordance with the Federal legislation and as a follow up of the provisions of the Land Code of the Russian Federation, the Urban Development Code of the Russian Federation, the Administration adopts the By-Law on Procedures for Allocating Land Parcels to Individuals and Legal Entities within the Tobol'sk Municipality.

1.3 Requirements of International Financial Organizations

The main requirements of the financial institutions to be taken into account when requesting financing include the requirements of the International Financial Corporation (IFC), the World Bank, the European Bank for Reconstruction and Development (EBRD), and Equator Principles.

Requirements of the International Financial Corporation (adopted on 30 April 2006)

The main IFC document defining requirements to the projects to be financed by IFC is the IFC Policy and Standards on Social and Environmental Sustainability. These set forth the core commitments of IFC aimed at fostering the socially and environmentally sustainable economic development of private sector in the countries with transition economy. The focus is on the project categorization, interaction with the public, the follow up monitoring of social and environmental aspects of the Project.

In order to implement its commitments, IFC developed standards for the projects to be financed by IFC. The IFC standards cover the following aspects:

- Social and environmental assessment and management system;
- Working personnel and labor conditions;
- Pollution prevention and abatement;
- community health, safety, and security;
- Acquiring property and resettlement;
- Biodiversity conservation and sustainable management of natural resources;
- Indigenous peoples;
- Cultural heritage.

The World Bank Requirements

The World Bank is a group of several major financial institutions including IFC, i.e. many IFC requirements are part of the World Bank requirements. The main documents that contain such requirements include (i) "The Pollution Abatement and Prevention Handbook" (published in 1998; it includes the principles of environmental management as a whole and its components; it also has specifications in accordance with various industrial sectors); (ii) Environmental Assessment Handbook: (published in 1999; it also includes the Bank's operational policy and procedures, requirements to the scope of the environmental assessment (depending on the Project category), the need to disclose information, carry out environmental monitoring in the course of the project implementation).

Equator Principles

The Equator Principles, the latest version of which was adopted in July 2006, is a general document to guide the development of projects in accordance with the principles of social responsibility and good environmental management practices. These principles have been adopted by 63 financial organizations a a mandatory requirement for project financing. The Equator Principles comprise 9 principles, which are mandatory for projects.

- Analysis and classification;
- Social and environmental assessment;
- Applicable social environmental standards;
- Action Plan and Management System;
- Consultations and information disclosure;
- Public grievance mechanism;
- Obligations;
- Independent monitoring and reporting;

The European Bank for Reconstruction and Development Requirements (as amended on 12 May 2008)

The main EBRD requirements are part of the EBRD Environmental Policy. This Project, which is attributed to Category "A", requires environmental impact assessment. EBRD also requires that projects be compliant with the national environmental standards and norms, best international environmental practice, including EC environmental requirements as applicable to the project, as well as the World Bank safeguards and IFC directives concerning protection of the indigenous peoples rights, prevention of resettlement, and conservation of cultural heritage. The Policy also requires implementing the international treaties and agreements and providing access to the stakeholders to the environmental information, public consultations.

The main requirements of the international environmental practice as applicable to this projects are part of the Document "The Best Available Technologies in the Production of Nonorganic Chemistry Products" (August 2007) developed by the European Commission as a follow up of the EU Directive 96/61/EC "Integrated Pollution Prevention and Control". The Document describes methodology for attaining the best available technologies and the best available technologies themselves.

2.0 THE PROJECT

2.1. The Project Area

The polypropylene plant will be located within the OOO “Tobol’sk-Neftekhim” production site (the city of Tobol’sk, Tyumenskaya Oblast').

OOO “Tobol’sk-Neftekhim” has:

- adequate free space to accommodate a new production facility;
- excessive capacity to treat all kinds of wastewater;
- substantial reserve waste disposal capacities (Waste disposal site P-10 and the sludge lagoon);
- reserve capacities for the treatment of water (drinking and clarified water);
- sufficient reserve energy supply capacities (process air, pneumatic air and nitrogen).

Administratively, the polypropylene facility site is part of the Tobol’sk (Tyumenskaya Oblast') industrial zone.

The layout of the proposed plant is presented in Annex 2.

The preliminary General Plan of the site is presented in Annex 3.

The land parcel for the construction of the polypropylene plant was leased out to OOO “Tobol’sk-Polymer” by the Tobol’sk Administration (Agreement No.685/1598/49.TP dated 01 December 2006).

The land parcel for the construction of the polypropylene plant is partially free from buildings and structures. The site houses several uncompleted buildings and structures (uncompleted production premises, racks), with some of them to be used after their completion (the uncompleted warehouses and office building). Under the agreement, the rest of the facilities will be removed.

The leased land parcel is located within the boundaries of the OOO “Tobol’sk-Neftekhim” production site. OOO “Tobol’sk-Neftekhim”, like OOO “Tobol’sk-Polymer”, is a member of OAO SIBUR Holding. At the same time OOO “Tobol’sk-Polymer” is an independent legal entity. There will be no changes in the size of the area and boundary of the OOO “Tobol’sk-Neftekhim” site in connection with the construction of the new production plant.

The site has no buildings and structures that are owned by the lessee and third parties in favor of whom right-of-ways were established as encumbrances for the land use rights of OOO “Tobol’sk-Polymer”.

The nearest residential houses of the city of Tobol’sk are about 8.6 km west of the OOO “Tobol’sk-Polymer” site boundary.

The nearest settlements are located north-west of the site and include:

- Mikhailovka village 4.5 km;
- Sokolovka village 4.7 km;
- Denisovka village 5.0 km.

The Rayon has a well developed network of railways and motor ways built for the Tobol'sk industrial cluster.

Passenger and cargo traffic is carried out through the following transportation means:

- external railway;
- asphalted motorways;
- the Tobol'sk river port on the Irtish River.

2.2. Site Boundary and Allocated Land Area

The total area of the leased land parcel is 121.99 ha.

The site is surrounded with:

- wasteland and further on the utilities of the Tobol'sk Thermal Power Plant (TTPP)in the north;
- the OOO "Tobol'sk-Neftekhim" production sites in the north-west;
- uncompleted project facilities (concrete buildings of the shops; rack) and further on the operating facilities of the internal infrastructure of OOO "Tobol'sk-Neftekhim") in the west;
- the "Yuzhnaya" Tankage Facility in the south-west;
- the motorway in the south followed by uncompleted storage facilities, railway, wasteland;
- the wasteland in the east and southeast followed by the railway and forest.

2.3. The Enterprise

The core business of the proposed OOO "Tobol'sk-Polymer" is polypropylene manufacture, with the projected capacity of 500,000 t/y.

Polypropylene will be made from propane to be supplied from the existing central gas fractionating unit (CGFU) of OOO "Tobol'sk-Neftekhim".

The new facility will be connected to the existing infrastructure of the operating OOO "Tobol'sk-Neftekhim" (water supply, sewage, treatment facilities, thermal water delivery, compressed air, nitrogen, transportation system), which has sufficient reserve capacity to maintain the proper operation of the new facility. OOO "Tobol'sk-Polymer" will be connected to the utilities of OOO "Tobol'sk-Neftekhim" in accordance with the issued applicable specifications (TU).

Power will be supplied to the enterprise from two sources: (i) two sections of generator distribution unit (10 kV) of Tobol'sk Thermal Power Plant (owned by TGK-10) in accordance with the issued specifications.

Steam for OOO «Tobol'sk-Polymer» is to be supplied by the internal boiler- house consisting of three boilers, each of capacity140 t/hr. Thermal water is to be supplied by the internal steam-water heaters.

The facilities' will be supplied with the natural gas by the existing gas distribution station (GDS) «Tobol'skaya» - municipal boiler station №1 in accordance with the issued specifications.

The OOO "Tobol'sk-Polymer" production facility will be comprised of:

- two main process units: a propane dehydration unit producing polypropylene, (licenser-company Universal Oil Product (UOP) with a flare system and an intermediate storage of propylene; polypropylene production (synthesis) (licenser-company INEOS) with a flare system and a silo storage of polypropylene;
- utilities, Infrastructure and Offsites (UIOs), (permanent accommodation and offices, a laboratory building, a process control building, a pump station of water circulation system with cooling towers, a UIO building, a system of fire water supply, the main input distribution unit (10 kV), an area for containers and polypropylene storage in pallets).

Polypropylene will be made from liquid propane fraction to be supplied to the proposed facility from CGFU of OOO "Tobol'sk-Neftekhim".

The main product of the proposed facility will be polypropylene homopolymer in a variety of brands to be used in die casting, blow molding, as well as in the manufacture of sheets, film, fiber, etc.

The facility will make such polypropylene brands as required by the international and internal market demand.

The polypropylene properties attribute it to low hazardous compounds.

2.4. Technological Process

Polypropylene is produced in accordance with the following main stages:

- feedstock preparation;
- propylene production
- polypropylene production;

Feedstock Preparation

Feedstock for the proposed production will be supplied through a pipeline from CGFU unit of OOO "Tobol'sk-Neftekhim".

The feedstock preparation process includes treatment of the propane fraction from methanol at the methanol column and then treatment of the main nitrogen compounds, compounds of heavy metals (catalytic poisons), and water. After the treatment and drying, feedstock is sent to the reactor.

Propylene Production

Propylene will be produced at the propane dehydration unit (PDU) designed to convert propane into propylene by dehydration. PGU operation is based on the licensed Oleflex™ technology by Universal Oil Product, USA.

The Unit is comprised of the following main technological sections and system.

- Removing methanol from the feedstock;
- Removing the main nitrogen compounds from the feedstock through non-regenerated adsorbent, and heavy metal compounds (catalytic poisons), and water;
- Reactor operation;
- Cooling the reaction products and compressing the product when it leaves the reactor;
- Drying (to remove water and H_2S from the reaction products;
- Separating liquid hydrocarbons from the reaction products;
- Depropanizer column;
- Selective hydrogenation reactors (SHG) located in the fractioning section to saturate unsaturated hydrocarbons arriving from the separation operation;
- The hydrogen treatment system (PSA), with treated hydrogen to be sent to the selective hydrogenation reactors;
- Continuous regeneration of catalyst;
- Steam generation system.

Dehydration reaction is conducted in the gaseous phase at high temperatures (heat is supplied from the furnaces) in the presence of solid catalyst. Dehydration turns propane into propylene. The propane dehydration catalyst is regenerated in a separate section.

The dehydration reaction products are cooled, compressed, cleaned from water and hydrogen sulfide, and then sent to the separation and fractioning sections to remove by-products, hydrogen and remaining propane, which is then sent back to dehydration.

The reaction by-products including unsaturated hydrocarbons are sent to the selective hydrogenation section (SHP) to pass them on to OOO “Tobol’sk-Neftekhim”.

Part of hydrogen goes through the treatment system and is then sent to the propylene polymerization unit and selective hydrogenation section (SHP). The other part of the hydrogen containing gas is used as fuel gas for the furnaces and boilers of the propane dehydration unit.

The polymer-type propylene goes as a flow of liquid to the propylene storage and polypropylene synthesis unit.

Excessive hydrogen gas is removed from the unit through the propane dehydration unit flare system.

Polypropylene Production

Polypropylene is produced at the polypropylene synthesis unit on the basis of the technology designed and licensed by INEOS to process propylene into polypropylene. The technology is based on the process of continuous propylene polymerization on the catalyst in the gaseous phase in two horizontal gas-core reactors.

Technologically, the unit is divided into two lines (Line 1 and Line 2).

The systems (sections) that work for the entire unit are included in Line 1:

- propylene extracting block;
- flare separator;
- wastewater collection system;
- aluminium ethide removal;
- condensate recuperation system;
- air system instrumentation controls;
- talk discharge and delivery system.

Each of the lines has the following sections:

- section for the delivery of catalyst, so-catalyst, and donor;
- polymerization section;
- section for deactivation and removal of volatile substances from the powder polymer;
- extrusion section;
- granules mixing section.

The feedstock (propylene monomer) for the propylene production will be delivered from the propane dehydration unit.

Polypropylene is formed in the reactor as powder, which is then delivered to the deactivation system to remove hydrocarbons and neutralize the catalyst activity. In the deactivation system, hydrocarbons are separated from the powder and returned to the reactor after compression.

To remove the residual hydrocarbons and neutralize the catalyst, the polypropylene powder is sent to the blowing column together with nitrogen and steam. Hydrocarbon steams, which have been removed, are compressed and sent to the propylene regeneration unit.

From the blowing column, the polypropylene powder is sent to extrusion, where it is mixed with additives and granulated.

Formed through polymerization reaction, propane (a by-product) is returned to the propane dehydration unit.

To discharge the excessive amounts of hydrocarbon gas from the polypropylene unit, a flare system is used, which will be established in the zone of the outlying flares. It will have one collector, two flare stacks, and a knockout drum.

2.5. Working Hours

The enterprise will be working non-stop with only one stoppage for the capital repairs once every two years.

The production facility will be staffed with:

- 95 white collars;
- 500 blue collars;

The plant will be operated in two shifts.

3.0. BASELINE CONDITIONS

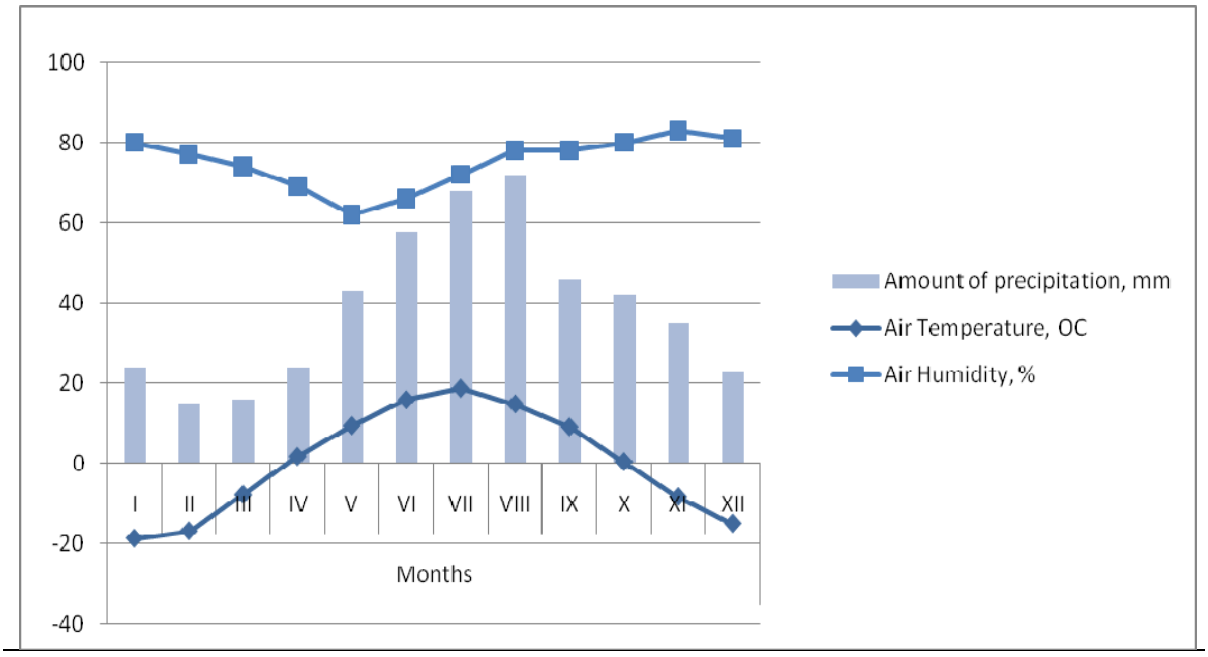
3.1 Climate

Description of the Site hydrometeorological conditions is based on the data from the Joint Tobol'skaya Hydrometeorological Station.

The Project area is located in Climate Region I, Subregion 1-V. The weather conditions depend mainly on the macro-circulation process of the Northern Hemisphere and geography of the area. The dominance of continental climate is due the fact that the area is located at an equal distance from the centers of the World Weather: the Icelandic Low and Siberian High. At any period of the year, the area may be freely penetrated by arctic air masses from the North and dry masses from Kazakhstan and Central Asia resulting in dramatic air temperature extremes within as short period as 24 hours. Winds often change their direction causing dramatic weather changes, especially in spring and autumn. Caused by the advent of land arctic air masses, anticyclones usually bring along frosty, clear, and nearly windless weather in winter and hot and dry weather in summer, if anticyclones come from the south. Throughout the year, anticyclone weather prevails. Cyclones generally come from the Atlantic Ocean and Mediterranean Sea. In winter, they bring along snow falls, snow storms, and blizzards, while in summer they cause cloudy weather and rain.

The radiation balance of geological substrate displays clear seasonal variations. The observations of the Joint Tobol'skaya Hydrometeorological Station show that negative balance is observed from October to February varying from 1.2 to - 0.8 kkal/cm^2. In summer, radiation balance could be as high as 8.1 kkal/cm^2. The total annual balance is 30.4 kkal/cm^2. The main climate data are presented in Figure 3.1-1.

Figure 3.1-1. Climate parameters of Tobol'sky Rayon



Air Temperature and Humidity, Precipitation

In the Project area, the average annual temperature is 0.2°C. The coldest months are December through to February, with average monthly temperatures ranging from – 18.8°C to – 15.1°C (see Figure 3.1-1). The absolute minimum temperature was recorded at -51.8°C, observed in December 1958. July is the warmest month, with the average monthly temperature of 18.6°C. The absolute maximum temperature throughout the period of observation was 39.6°C. In the Project area, spring begins in the first 10 or 20 days of April. At this period, average daily temperature passes through zero. In autumn, average daily temperature passes through zero in the second 10 days of October. Usually, the frost free period lasts 180 days. Summer (a period with an air temperature above 10°C) starts in the third 10 days of May. Winter frosts, caused by the advent of arctic air masses, may occur in any summer month except for July. The first autumn morning frosts are observed in the first 10 days of September. As a rule, permanent frosts occur in the second 10 days of December.

The climate region under review is located in the humid area. The total long-term average annual precipitation is about 466 mm. The highest total monthly precipitation is in June and July, while February and March receive least precipitation total (see Table 3.1-1). Throughout the year, precipitation pattern varies (see Figure 3.1-1). Most of precipitation (75%) falls in the warm season (April through to October), and 25% account for the cold season (November through to March).

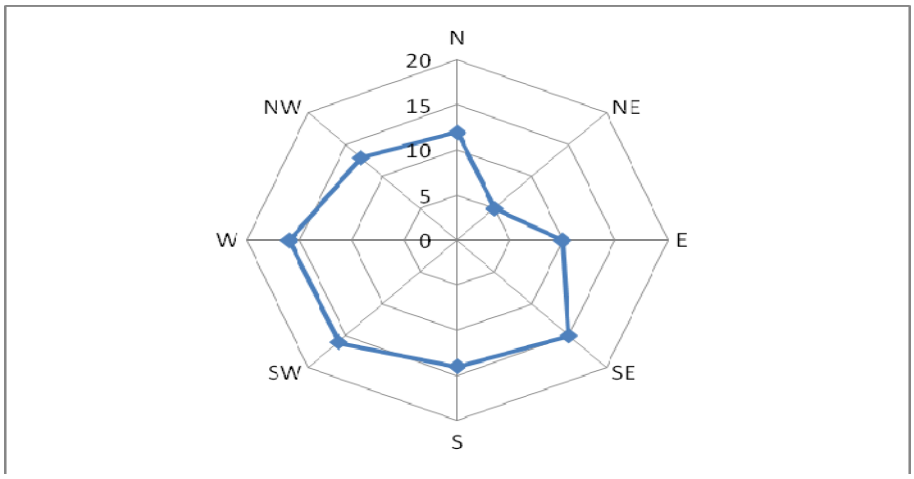
Most of the year, relative air humidity remains high, with the maximum parameters observed from August to March (74% - 83%) and minimum from April through to July (62%-75%) (see Figure 3.1-1). The average annual relative air humidity is 75%. Drier air with relative air humidity below 30% is observed very rarely and only in summer time. Most of the days with high relative air humidity (over 80%) are observed in November through to December.

Speed and Direction of Wind

The Project area is characterized by a high frequency of wind directions. Changes in the air circulation pattern lead to the changes in the direction of the main air streams and wind pattern.

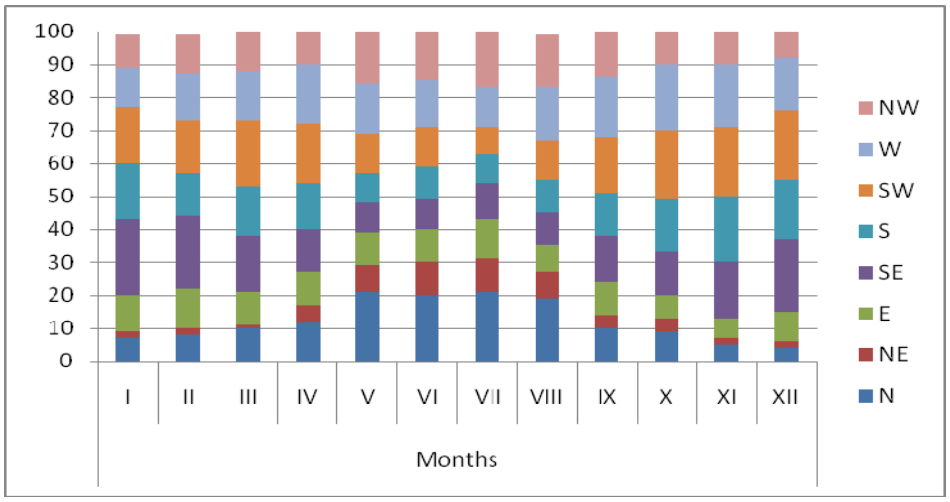
The frequency of the no-wind conditions is on average 12% a year. In January, the highest average bearing wind speed is 6.3 m/sec, while in July the highest average bearing wind speed is 4.1 m/sec (see Figure 3.1-2).

Figure 3.1-2 Speed and Direction of Wind, %



The wind direction is clearly seasonal. In winter, most of the winds come from the south, south-east and south-west. In summer, most of the winds come from the north, north-west, and west (see Figure 3.1-3). In spring and autumn, the prevailing winds are south-easterlies.

Figure 3.1-3: Wind Direction

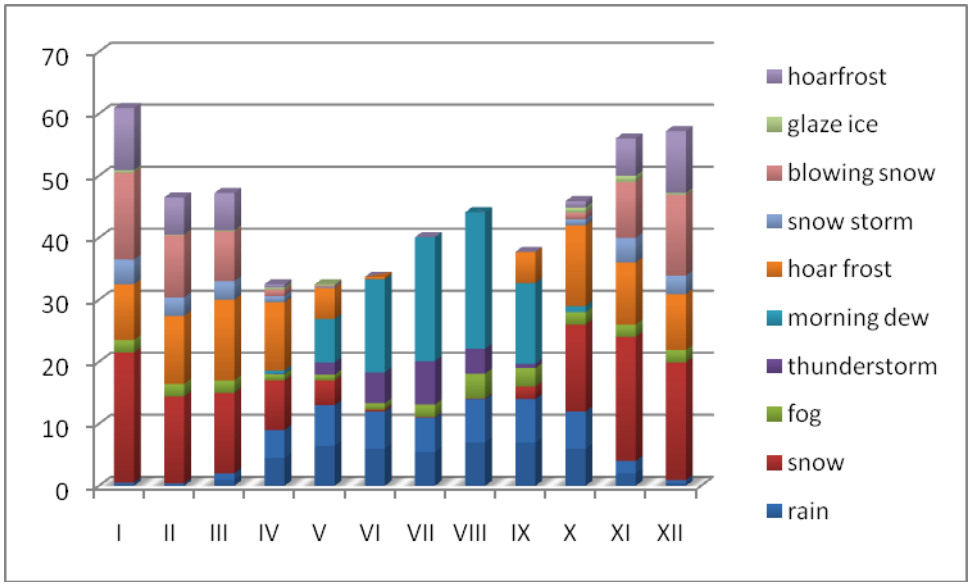


Atmospheric Events

Figure 3.1-4 presents the average and largest number of days with different atmospheric events (fogs, thunderstorms, snowstorms and hail).

Thunderstorms are observed from April through to October, with most of the thunderstorms observed in July. Fogs are observed throughout the entire year, with most of the fog events observed in August through to March, while the smallest number of fogs occurs in May. In summer, the most frequent event is dew, while in winter it is snow falls with blowing snow and snow storms.

Figure 3.1-4 Average Number of Days with Different Meteorological Events



Snow Cover and Ground Freezing

In the Project area, persistent snow cover generally sets in towards the end of October. The time for its formation varies a lot from year to year depending on the nature of the weather in the period prior to the winter season. Persistent snow cover lasts 185-189 days a year. Towards the end of winter or beginning of spring, snow cover becomes especially high and on unexposed portions of land the snow cover could be as high as 98-129 cm.

The site conditions of the Project area are typical for the southern part of the Tyumenskaya Oblast'. The territory as a whole is characterized by moderate indicators of the air temperature, small winds, which, during thunderstorms, may turn into strong wind blasts (up to 20 m/sec). Humidity pattern is comfortable, with the precipitation changing in accordance with the seasons, where most of precipitation occurs in summer.

The Project area is characterized by average conditions of pollutant dispersions. Generally, it has a relatively favorable wind pattern, except for its maximum speeds and short wind blows.

Atmospheric Air

In the Project area, the background condition of the atmospheric air could be characterized on the basis of the data (Annex 11) presented by the Joint Tobol'skaya Hydrometeorological Station. Submission No.1/042 dated 17 March 2008. Validity of the data is till 31 December 2011.

The background data were provided in accordance with the estimates calculated by GU Omsky CGMS-R over the observation period of 2003-2007 under the ASOIZA Program, RD 52.04.186-89.

The background concentrations for the main pollutants are presented in Table 3.1-1 and in Annex 11.

Table 3.1-1. Background Concentrations of Pollutants in Atmospheric Air

Pollutants	Background concentrations, mg/m					MPC, mg/m^3
	Wind speed, m/se					
	0-2	3-7				
	Wind direction					
	Any	N	E	S	W	
Dust (particulates)	0.1	0.1	0.1	0.1	0.1	0.5
Sulfur dioxide	0.01	0.01	0.01	0.01	0.01	0.5
Carbon oxide	3	2	2	3	3	5.0
Nitrogen dioxide	0.04	0.04	0.04	0.04	0.04	0.2
Nitrogen oxide	0.01	0.01	0.01	0.01	0.01	0.4

According to the above data, background pollution of the atmospheric air in the Project area is currently within the sanitary standards. Maximum concentration is observed for carbon oxide (0.4-0.6 MPC), while the least concentration is observed for sulfur dioxide (0.02 MPC) and nitrogen oxide (0.025 MPC).

Monitoring conducted by the existing enterprise (OOO "Tobol'sk-Neftekhim") shows that to-date concentration of pollutants on the boundary of the approved SPZ (1,000 m) meets the statutory standards.

Pollutants concentration in the surface layer of the atmosphere is monitored on the SPZ boundary and at two points of the residential area of Tobol'sk. Samples are taken three times a day. The controlled substances include saturated hydrocarbons and unsaturated hydrocarbons, nitrogen oxides, sulfur dioxide, carbon oxide, dust, phenol, formaldehyde. All the indicators are well within MPCs.

3.2. Topography and Geology

Geological and geomorphological description of the Polypropylene Plant Construction Project (OOO Tobol'sk-Polymer) impact zone is based on the literature [27,38,66,67,69].

Terrain

The Project area is confined to the right bank of IV-th fluvial terrace of the Irtish River. The terrace has a smooth and flat topography with a slight northward slope. There are small water logged depressions.

Elevations of the land surface are about 97-98 m (by exploratory wells benchmarks).

The industrial development of the area (forest logging, road building, and construction of various facilities) kept on changing the natural terrain, which, in turn, resulted in waterlogging of the vast areas, watering of the soils, and water table rise.

Geology

The syncline structure of the Western Siberian Platform has a complex system of tectonic elements of various sizes (from major to local ones). Its large central part (the inner area)

has closed depressions, anticlinal folds and large domes. The Project area is confined to the north-western extreme end of Tobol'sky Dome.

Seismicity of the Project area was determined on the basis of maps of the overall seismic zoning of the territory of the Russian Federation (OSR-97) approved by the Russian Academy of Sciences (SNiP II-7-81* Construction in Seismic Areas; Gossstroi of Russia; Moscow, 2000). The design seismicity at MSK-64 scale for average ground conditions (Ground Category II by seismic qualities) for the city of Tobol'sk is rated only against Map "C" (1% of the probability that within 50 years, the design value of seismicity will be higher) and is 6 points. By seismic properties, the soils on the Project site shall be attributed to Category III.

Drilled to a depth of 25 m, the geological log is comprised of surface (prII IV) and glacial-lake (1a II) clayish soils, overlaid from the surface with shallow (up to 0.3 m thick) top soil (e IV). The surface also displays fragmented filled soil [t IV] comprised of loams and sands along with construction garbage, to a depth of up to 1-2 m.

Covering deposits are comprised of hard and flow gray-brown loams. To a depth of 2.0-2.5 m, they are characterized by macroporosity and high iron content. The loam layer is 4 to 6 m deep. .

The glacial-lake deposits are mainly comprised of bluish/green-gray to dark gray hard to flow loams. At a depth of 8 to 12 m they are comprised of patches and thin interlayers of peat mold of black color. Beyond the depth of 12 to 15 m the loam formation has a lot of sand inclusion, with interlayers of dusty micaceous sands. The maximum opened up thickness of the loam formation is 20 m.

At a depth of beyond 25 m, alluvial deposits are found [aII] comprised of sands interlaid with sand clay and loams.

The grounds comprising the site have neither subsidence nor swell potential.

3.3. Surface and Ground Water

Surface Water

The site for the construction of the proposed production facility has the flooded pits of the previously uncompleted construction project with some piles that remained there. There are also land reclamation ditches, fire reservoirs and small boggy land parcels. All these are fed from precipitation. Water is mostly lost through evaporation since soil infiltration is weak.

The Chistoye-1 bog is a water body that is closest to the Project site. It is located about 0.8-0.9 km north of the Project site. The nearest major water course is the Irtish River, which runs around the industrial zone and the city of Tobol'sk and is located 10.5 km west and 9.2 km south of the industrial site.

Chistoye-1 Bog

The Chistoye-1 bog is located about 600 m northwest of the northwestern point of the "OOO Tobol'sk-Neftekhim" Site and 800-900 m of the OOO "Tobol'sk-Polymer" site boundary.

The bog is 42 km^2 large. It is a lowland bog with the peat deposit of 2-3 m deep.

The water level pattern of the bog is as follows. In spring and during the autumn rains, the bog is flooded with water. In the depressions, the water level may be as high as several dozens centimeters. In summer and winter, the water level is lower. In winter and dry summer periods, the level of bog water is lower than the bog surface. Thus, in the drier winter and summer periods, the runoff water is not mixed or diluted with bog water. In the main part of the bog, the ground water table is 0-0.3 m.

The impermeable horizon is mainly located at a depth of 1.5-2.5 m, though the level of this horizon varies significantly. No drying of vegetation is observed near the outfall.

The boggy soils are rich in humid acids that are capable of binding iron cations. One specific feature of the hydrochemical composition of the bogy water is high natural content of organic substances and iron.

The hydrochemical characteristics of water in the Chistoye-1 bog is presented in Table 3.3-1.

Table 3.3-1. Hydrochemical Characteristics of Water in the Chistoye-1 Bog

#	Components	Background concentrations in the bog, mg/l	MPC, mg/l
1.	Suspended solids	12.8	Background+0.75
2.	Nitrogen nitrate	0.15	10.2
3.	Nitrogen ammonium	0.19	2.0
4.	Nitrogen nitrites	0.009	1.0
5.	Chlorides	13.3	350
6.	Sulfates	21.3	500
7.	Total iron	0.76	0.1
8.	BOP, full	15.8	6.0
9.	Phosphates	0.23	3.5
10.	Synthetic Surfactants	0.025	0.5
11.	Oil products	0.059	0.3

The Irtish River

The Irtish River is the largest tributary of the Ob' River. According to the hydrochemical yearbooks for 2006-2007, this river is one of the most contaminated water bodies and needs priority pollution abatement activities.

The river water has high content of manganese and iron, which is due to natural factors. The ground water of the area is characterized by high concentration of iron and manganese, which is its accompanying element. Such high concentration of these elements is caused by the fact that this is mostly a boggy area, with water rich in organic

substances and iron-containing minerals. Iron concentration tends to increase towards the Irtish estuary due to the climate factors and higher share of the bogs.

The river water quality may be characterized in the range of “moderately contaminated” to “highly contaminated”. The highest level of contamination is observed near the city of Tobol’sk.

The quality of the Irtish River was determined in accordance with the “Statement on the Concentration of Pollutants in Water (the Irtish River, the City of Tobol’sk)” issued by GU Tyumensky Center for Hydrometeorology and Environmental Monitoring (GU TCGMS) on 01 April 2008, No.CGMM-17/53. The data are based on the results of the 2005-2007 observations. The water quality parameters are presented in Annex 12.

The results of the analysis, carried out as part of the May 2007 monitoring, of the surface water near the Irtish water intake and drinking water are presented in Annex 12. The results of the surface water analysis show that three parameters are higher than their MPC values. These include COD (4.8 of MPC); soluble oxygen (2.25 of MPC) and total iron (2.2 of MPC). As for drinking water, higher concentrations are only observed for residual free chlorine.

Ground Water

The groundwater is confined to both the blanket and glacial-lake and alluvial clayish grounds, and to the underlying alluvial sand layer forming two hydraulically connected phreatic aquifers.

Ground waters are found at depths of up to 4.2 m to the ground surface (in the north) and to the land surface (in the south). In the context of absolute elevations, the ground water table is found at depths of 93.97 m to 97.61 m.

There is a trend to increase of ground water table in time. There are also seasonal groundwater table fluctuations.

The groundwater flow direction is mostly consistent with the overall terrain incline. The groundwater is recharged by infiltration of precipitation, while the discharge is through the bottom of streams and ravines.

Based on the filtration tests, the filtration ratios of the blanket loams range from 0.2 to 0.5 m/day, of glacial lake and alluvial loams: 0.05 to 0.1 m/day, of the same loams with sandy interlayers of 0.15-0.2 m/days.

By its composition, these are hydro-carbonate-sulphate-calcium-natrium waters, with water salinity levels ranging from 0.15 to 0.7 g/l.

The groundwater is recharged only by infiltration of precipitation. The runoff of the melt and rainwater from the surface is constrained, therefore in the warm season the table of the groundwater is near the surface. In winter, the groundwater flow is, to some extent, discharged resulting in the lower table of the groundwater.

Since the proposed enterprise production site will be paved, the probability of the groundwater contamination is low. OOO “Tobol’sk-Neftekhim”, which will house the new

enterprise (OOO “Tobol’sk-Polymer”), carries out regular monitoring of the ground water quality near the sludge lagoon through four monitoring wells and near the waste catalyst landfill through 8 monitoring wells. Samples are taken once every three months.

The reason for this monitoring is the fact that beyond the main enterprise production site, the sludge lagoon and waste catalyst landfill may serve as potential sources of soil and ground water contamination.

Through the monitoring wells near the sludge lagoon, the following parameters are controlled:

- pH;
- Total hardness;
- Total saturated hydrocarbons and unsaturated hydrocarbons;
- COD.

In 2008, groundwater samples were taken in the course of the Geotechnical Studies carried out by ZAO Nordecho Eurasia and OAO Giprokauchuk. Annex 13 presents the results of the groundwater chemical analysis.

The groundwater samples were taken from the geological wells at various depths ranging from 2.8 to 7.7 m.

These samples were analyzed for the content of:

- oil products;
- heavy metals;
- general chemical analysis;
- polycyclic hydrocarbons;
- chlorides;
- aromatics.

The groundwater quality was assessed in accordance with GN 2.1.5.1315-03 “Maximum Permissible Concentrations (MPC) of Chemicals in the Water of Water Bodies for Drinking, Household, and Cultural Use” and GN 2.1.5.1316-03 “Approximate Permissible Concentrations (MPC) of Chemicals in the Water of Water Bodies for Drinking, Household, and Cultural Use”.

In the groundwater samples so analyzed, the petroleum hydrocarbons concentration varied from 0.301 mg/dc^3 to 4.730 mg/dc^3. In all the groundwater samples, oil product concentrations are higher than MPC (MPC 0.3 mg/dc^3). The highest petroleum hydrocarbons concentrations are found in the areas disturbed by human activities: Well 06129 – 4.730 mg/dc^3; Well 06152 – 2.585 mg/dc^3; and Well 06108 – 1.565 mg/dc^3, which is correspondingly 15, 8 and 5 times higher than MPC. Concentration of petroleum hydrocarbons of the samples, taken from Well 06029, is 0.463 mg/dc^3, which is 1.5 times higher than MCP, while concentration in the samples taken from Well 06021 is 0.301 mg/dc^3. In all the groundwater samples, the polyaromatic hydrocarbons concentration was beyond the sensitivity of the identification method. In all the groundwater samples, the aromatics concentration was beyond the sensitivity of the identification method.

3.4. Soils of the Project Area and the Current Status of Soils within the Production Site

The soil cover of the Tobol'sky Horizon "D" Upland (the Polypropylene Plant Construction site of OOO Tobol'sk-Polymer is confined to the western end of the Uplands) has been studied and developed for more than a hundred years.

The soil formation conditions in this territory have some features that determine the geographical uniqueness of the prevalent soils and soil cover. Here, soils were mostly formed by glacial lake Pleistocene – Holocene subaerial yellow-brown and light brown loam deposits 15 to 18 m thick [2.67]. They are interspaced with sand clay and sand layers, and buried hydrogenic soils of Pleistocene horizons impregnated with organic substances. The first meters of the log demonstrate the loess-erosion processes that increase subsidence of these soils, in particular, near the primary slopes of the valleys [67].

According to the data available [24] the above loam soil forming deposits contain 35 to 60 percent of physical clay including 20 to 40 percent of silt particles up to 0.001 mm in size. In addition to low (for loams) specific weight (1.2 to 1.6 g/cm3), the deposits are characterized by the contents of course dust and high porosity (35-50%). And it is due to this specific feature, that these deposits may be viewed as loessy soils. Their bulk composition is dominated by oxide of silicon (65-80%), with aluminum and iron accounting for 10-20 and 4.5-6% of the fine soil mass correspondingly, and about 1-1.5% accounting for titanium, and 0.05-0.15% for manganese. The mineralogical composition of the sandy and course dust fractions is dominated by crystalline silica and feldspathic. Heavy minerals (hornblende, epidote, and swamp-ore) account for 5 to 15% of this fraction. The clay fraction is dominated by hydromica (20-85%), kaolinite (5 to 70%), and smectite (5 to 70%). In the log, the content of calcium carbonate and magnesium ranges between 0.03 to 4%, but in most of the log it is not higher than 0.1%. The increased content of carbonate is observed in the loess interlayers. The content of the water soluble salts ranges from 0.06 to 0.4%, with the highest content in the vertical distribution confined to the buried soils.

Permeability of these deposits range between 0.1 to 0.4 mm/min and this, in combination with the high porosity and moderate fracturing, forms a leaching water regime or leaching water regime with stale elements and good conditions for the accumulation of moisture above the heavy loam aquitards. Accordingly, the deposits of the entire log feature old and new hydromorphosis as new red- ochreous formations (noddles, slight ballstones, and patches). For the soils of this area, an average highest depth of freezing is about 1 m.

Under the above circumstance, the **key soil formation large-scale processes** include accumulation of humus (mainly, accumulation of course humus), podzolization, and gleyification, while the permanent or extended overwetting generate peat formation and gleyification.

Leading Type of Soil Formation and Zonal Soils

The soil cover of upland soils in this area is dominated by the sod-modal podzol deep gley medium-textured loam soils with the second humus horizon. The adjacent areas form sod-podzol-gley soils with the second humus horizon, as well as sod-gley and gleyish podzolized medium-textured loam soils [2].

The specific profile (the composition of genetic horizons) of the sod-podzol medium-textured loam soils of the Tobol'sky Horizon "D" is like this [24,36]: AO – A1 – A1A2 – A2h – Bh – B – BC – C. "h" means the so called second humus horizon, i.e. the feature of the local soils emphasizing their paleogeographic uniqueness.

The upland terraces of the Irtish valley are dominated by the sod-mesopodzol and modal podzol soils including gley soils with the second humus horizon (patches). At the lower orographic level (at the level of fluvial terrace s of the Irtish tributaries) about half of the area account for humic-sod and gley, sod and humus-gley ground and surface-iron soils. These soils also feature a second humus horizon [36].

On the flat lands of the interstream areas, weak drainage forms sod-podzol-gley soils. The consistent arrival of atmospheric moisture and overwetting leads to intensification of the gley formation process, the products of which saturate the entire soil profile in a uniform way. Under the young peat bed 3 to 5 cm thick, there is a grey-blue gley horizon with many ochreous patches of ferruginization.

The physical and chemical properties of the sod-podzol and sod-gley podzol soils, which prevail on the interstream areas and high terraces of the Irtish, reflect the specific local conditions of soil formation and the history of landscape development in the Tobol'sky Horizon "D". Generally, the soils are leached free of carbonates, sulphates, chlorides, and are characterized by acid reaction (in the upper part of the profile, pH of the salt suspension is up to 4, of water suspension is within 4.5-5.5), relatively poor minor elements content and high content of ash elements. Typomorphic are chemical elements such as iron and hydrogen. In addition to accumulation, Horizon A1 and sod-podzol soils demonstrate the leaching of chemical elements from Horizon A2 followed by their partial accumulation in Horizon B (Bh). The humus content in Horizon A1 is rarely higher than 3%, and the deeper the log is the less is the humus content. The base exchange capacity is low in both the humus and illuvial horizons. Absorbed cations are dominated by hydrogen, aluminum, and calcium [24].

The total average content of minor elements in these soils ranges from 600 to 1,500*10^{-3} %. The minor elements composition of the soils is mostly represented by W, Sc, Mn, Be, Zr, and Y and Yb to a lesser extent. Ni, Ti and Cr are observed in relatively larger contents. There is also a wider variation in the values of the regional rate of concentration (Kr) [38]. Some soils have a content of zinc, copper and cobalt (3-3.5 times), lead and barium (2.-2.5 times) that are higher than the abundance ratio of the podzol soils. And just the opposite, the content of molybdenum is twice as small as the norm [24].

The status of the enterprise location area within the systems of soil-geographical, soil-ameliorative and agricultural zoning; Intrazonal and azonal soils of the rayon

According to the regional soil and geographical zoning [24], this area is part of the Turtas-Irtish rayon of the secondary sod-podzol and peat-boggy soils. This area is characterized by good drainage, developed gully and raving network, abundance of relics as soils with the second humus horizon and buried soil horizons in the depth of Pleistocene glacial lake deposits. In addition to the above zonal soils, the interstream areas and river terraces demonstrate podzols (on the soil formation deposits of fine texture).

Boggy peat soils occupy about half of the rayon territory. They are covered by moss-bush and rare fir vegetation that generates acidit of pH 5.1-5.3 when decomposed and are

characterized by low ash content (5.4%) and rather high content of Ca, N, P [24]. Generally, since these soils are moisture fed from the atmosphere, their chemical composition is monotonous and poor. Decomposition of organic matter in the anaerobic conditions is accompanied by the formation of weakly oxidized mobile compounds of iron and manganese.

The low land peat bogs are dominated by grass peat bogs groups such as sedge grass and hypnum moss-peat bogs, while wood-sedge grass bogs and reed-sedge grass bogs are a rare occasion. This group demonstrates higher ash content (7-17%), high content of nitrogen, calcium, and phosphor. The decomposition rate of peat is also rather high, with a value of pH of the low land peat bogs in the range of 4.8 and 6.2 [24].

Upland bogs are observed in the depressions among the upland sands of the interstream areas. In the upland bogs the thickness of peat layer may be more than one meter in many cases. By its composition, most of the peat is sphagnous and sedge grass-sphagnous peat. As for geochemical properties, the set of peat bog upland and peat bog low land soils demonstrates relatively high values of concentration rates of elements such as Mn, Y, Sc, Ni, и W [38]. The minor elements content in the peat soils show low total average gross values in the range of 700-800×10^{-3}%.

The soil cover of the transition zones between the areas of the podzol and bog soils includes bog-podzol and sod-gley soils in a variety of combinations. The morphological profile of these soils includes surface organogenic horizons (peat underlay, shallow peat or peat vegetable layer) 2-10 cm thick, a horizon of humus or course humus accumulation of different thickness followed by bleached gley horizon impregnated with new formations of iron oxides. Further below, one can find a variety of ferruginized mineral horizons impregnated with water during most of the year.

The flood plain complex of river valleys of this territory is characterized by alluvial sod-gley podzolized soils in combination with flood plain soils, with frequent changes of the soil texture [2]. By their composition, the alluvial soils of the upper flood plains are close to sod-podzol soils with up to 4% of humus and 4.5-6.2 of acidity.

According to the soil and amelioration zoning, the area around Tobol'sk is attributed to Soil Suitability Class "A", the sod-podzol and alluvial soils of which require, first of all, heat amelioration and formation of vegetable plowing horizon. In the valleys, the requirements include the establishment of mole drainage and hayfield improvement activities [2]. The Tobol'sk Rayon agriculture focuses on the dairy and meat husbandry, potato and cereal production. It will be noted, however, that the farming areas are not that large as compared with the areas south of Tobol'sk Oblast [20]. Historically, the Tobol'sk area formed a special ribbon type of the river-side development with a dense network of permanent – mostly small – settlements. The soil cover of upland terraces and interstream areas is disturbed by human activities to a lesser extent, but the potential fertility of these soils is low. Therefore, in case of reclamation or destruction of the topsoil, high doses of organic and mineral fertilizers should be applied. The entire rayon is classified as an area with the environment that was subjected to severe changes [20]. The soil cover of industrial sites was subjected to the most severe transformations and the enterprise site under consideration is no exception.

Current Status of Soils within the Proposed Production Site of OOO Tobol'sk-Polymer

In 2008, the comprehensive environmental site studies conducted by ZAO Nordeco Eurasia and OAO Giprokauchuk on the site of the proposed allocation of the OOO Tobol'sk-Polymer production facility studied the soils of four production sites such as (i) container facility to be designed; (ii) the earlier propylene dehydration site; (iii) propylene dehydration site to be designed; and (iv) flare facility (Annex 8). The size and configuration of the production site were finalized in 2009 and, hence, the boundaries of the investigated area (Annex 8) are not consistent with the land allocation line (Annex 3).

The investigation activities included field surveys, soil sampling, laboratory analysis of the samples and report preparation [28]. The soils were diagnosed in accordance with the Soil Classification of Russia (2004) Document. This Classification has not been formally approved and is still under development. In this OVOS section, these taxonomic divisions are brought into compliance with the units of Classification and Diagnostic of Soils of the USSR, 1997 [26] and Classification of Soils under GOS 25100-95 (Table 3.4-1).

The detailed descriptions of 18 soil samples (Annex 8) as reflected in the Report Documents [28] showed that within all the above four sites, the prevalent soils are: sod-podzol soils; sod-gley soils; bog-podzol soils; bog peat-gley soils in a variety of combinations with the participation of filled soils. Thaw and frost process signs are sometimes found in soils and ground. Since soils tend to restore themselves, soils that were disturbed by human activities demonstrate restoration signs such as accumulation of organic substances in the upper part of the profile, improvement of water and physical properties, etc. Table 3.4-1 presents the Structure of the Production Site Soils

Table 3.4-1. Structure of the OOO "Tobol'sk-Polymer" Production Site Soils

# of the land plot contour	Description of the land plot contours	Structure of soil cover in the land plot contour [28]	Prevailing soils within the land plot contours according to the USSR Soil Classification and Diagnostics, 1977/ Soil Classification GOST *25100-95.*	Area of the land plots, km^2
1	Proposed container facility site	Combination of gray-humus gley soils including technologically turbined (> 50 %), common gley soils (25 – 35 %) и sandy lithostratum (10 – 25 %).	Combinations of sod-podzol soils; sod-gley soils; bog-podzol soils; bog peat-gley soils with some artificially accumulated soil layers/*Natural disperse cohesive mineral and organic-mineral soils in combination with technological cohesive and loose filled soils, with changed physical and chemical effect*	0.40
2	Project dehydrated propane site	Combination of common sod-podzols (> 50 %) including the gley soils (10 -25 %).	Combinations of sod-podzol soils; sod-gley soils; bog-podzol soils; bog peat-gley soils with some artificially accumulated soil	0.41

# of the land plot contour	Description of the land plot contours	Structure of soil cover in the land plot contour [28]	Prevailing soils within the land plot contours according to the USSR Soil Classification and Diagnostics, 1977/ Soil Classification GOST *25100-95.*	Area of the land plots, km^2
			layers/*Natural disperse cohesive mineral and organic-mineral soils*	
3	The flare facility site	The area of common sod-podzol soils.	Sod-podzol soils of light texture / *Natural disperse cohesive mineral soils*	0.07
4	Water bodies	No soils cover. Information about the bottom deposits is not available		0.04
5	Buildings and structures	Artificially accumulated soil layer/ technological, mostly loose filled soils		0.05
Total:				0.97

The chemical properties of the sampled soils could be assessed through the results of the qualitative chemical analysis of the samples (Annex 14, Tables from 1 to 6). According to the data submitted, all the samples showed very low petroleum hydrocarbon concentrations ranging from 10 to 30 mg/kg and this is next lower order than the outflow of the bituminous substances from the organogenic horizons of the sod-podzol soils; sod-gley soils; bog-podzol soils; bog peat-gley soils. Equally low are phenols concentrations (0.1-0.5 mg/kg).

Most of the polycyclic aromatic hydrocarbons, included in the list of the USA Environment Protection Agency and the so called Dutch Lists (SP 11-102.97) were not found in the soil samples of the Project site. Locally, the samples showed the traces of pyrene, fluoranthene, benzaanthracene, chrysene, and benzfluoranthene. The absence of hydrocarbons such as naphthalene, phenanthrene, pyrene, anthracene, and chrysene is an unusual phenomenon since the total concentration of these substances in most mineral and organogenic developed territories of the soils in the moderate region 50÷500 10^{-3} mg/kg. The most hazardous of the aromatics – benz(a)pyrene – was only found in one sample in an amount of 0.001 mg/kg and that is much lower than MPC as set forth for this carcinogenic substance.

Thus, the sampled soils have practically no organic compounds, which generally are taken for common representatives of the technological flows caused by the operations of petrochemical industries. Since the report documents fail to indicate the depth of the soil sampling, it may be assumed that the organogenic soil horizons were sampled together with the underlying mineral horizons and the values as indicated in the report reflect the mixed samples from a depth of 0-50 or 0-100 cm rather than surface soil sampling (0-5 or 0-20 cm).

Inertness of the site soils is also confirmed by the parameters of their macro-component composition. Water extracts of most samples showed subacid reaction due to the presence of organic acids (including humus) and low content of mineral salts. Soil solutions indicated hydrocarbonate-calcium composition. The concentrations of nitrated, chlorides and magnesium were very close to trace concentrations. The content of natrium ions ranges from 18 to 55 mg/kg. Locally (Samples P1, P16, P18) there is weak

alkalization of the solutions with hydrocarbonates, the concentration of which grows to a value of 130-160 mg/kg, and pH to 7.8 units (Annex 14, Table 6).

The cation exchange capacity of the soils is low (up to 20 mg/equ/100g) or average (20-40 mg/equ/100g) depending on the soil texture. The gross content of one of a typomorphic elements – iron – is 0.3-3.3% (low as compared to the soil abundance ratio of this element). Manganese is present in the quantities that are within MPC (200-1,500 mg/kg). Taking into account the local conditions of soil formation, the high Mn content identified in individual samples (P9, P10) should be viewed as influenced by the natural conditions.

One specific feature of the minor elements composition of the sampled substances in the production site is also low contents of the main part of the target heavy metals. Lead concentrations were up to 19 mg/kg at the MPC values of 32 mg/kg and PPC of acid soils ranging from 32 to 65 mg/kg depending on the soil texture. Cadmium and mercury were not found in any of the samples. In 7 samples out of 14, zinc content was higher than PPC for this element as specified for acid soils of light texture. The PPC values for loamy soils (110 mg/kg) were not exceeded in any of the samples. Copper concentrations (except for one sample) were within the least value of PPC (33 mg/kg). Chrome contents appear to be slightly higher but the comparisons (as recommended in the Report [28]) of this element's concentrations with the MPC of mobile forms of Cr^{3+} could hardly be viewed as fair. In the absence of the recommended baseline and officially approved statutory concentrations of this element, comparisons may be made against the baseline and maximum permissible concentrations of the Dutch Lists, i.e. 100 and 380 mg/kg [65]. In 9 samples out of 14, the chrome concentrations were above 100 mg/kg but they were less than the levels requiring intervention. In most samples, nickel contents were above PPC as specified for sandy soils (20 mg/kg), and in three samples they were above PPC for acid loamy soils (40 mg/kg). Comparative contents of more than one element (Cr, Ni, Mn, Cu, Zn) were identified in the same samples and this could be an indication of the man-induced source of these poly-element lithochemical anomalies though these concentrations are rather low.

Thus, the sampled soils of the production sites for the proposed OOO Tobol'sk-Polymer production facilities show low levels of the concentrations of the pollutants that are specific for the technological flows of petrochemical enterprises. The concentrations of the target pollutants are low throughout all the samples and only for some minor elements they are slightly above PPC. The analyzed soils could be used without any limitations in construction and they do not demonstrate any toxic properties (permissible and moderately hazardous category of contamination according to SanPiN 2.1.7.1287-03). When using the soils of a moderately hazardous contamination category for filling out the areas of landscape gardening, it will be necessary to cover the fill-in area with clean subsoil of not less than 20 cm thick. To reduce the access of toxic metals to plants, it is recommended to apply organic fertilizers and lime.

3.5 Flora and Fauna

Flora

According to the current geobotanical subdivision, the Project area is located in the West-Siberian taiga botanic-geographical region. Sub-zonal vegetation types include: southern taiga boreal forests growing in the area alongside the Irtish River and comprised of spruce, fir and spruce, and spruce-fir forests, with small-leaved linden found in underwood from time to time, as well as of grass-bush and grass forests with mosaic moss cover. The intensive development of eutrophication in the Project area strengthens the role of the intra-zonal bog vegetation. According to the bog subdivision, this territory is attributed to the West-Siberian province of eutrophic and oligotrophic pine-sphagnous peat bogs. Most of the bogs are sphagnous and pine-sphagnous ridge pattern and pool pattern high-bog complexes, forested with pines in some places. The Chistoye bog is part of these complexes. The bog is located abut 7.5 km north of the facility and is part of the protected area in the state natural reserve of regional importance (the Abalaksky Natural Historical Complex). The vegetation also includes mesophytic and wet meadows of the Irtish flood plain alternating with willow stands and flood plain small-leaved forests. The total species s variety of the Project area includes over 450 species s of vascular plants, over 300 mushroom species s, about 200 moss species s, about 200 lichenous species s and over 250 algae species s.

Given the high level of the development and man-induced disturbance of the production site, no protected or endangered plant species s occur within the given area.

According to the floristic survey of the Project area, there may be one Red Data Book of Tyumenskaya Oblast' plant species (2005), *Tilia cordata* Mill; however occurring at a long distance from the site. It is attributed to Category III rarity (a depopulating species s on the range boundary with reducing numbers and narrowing range due to a variety of reasons) and is part of the *Tiliacae* family, a European species s, a relict of the tertiary period in Western Siberia. In the south of Tyumenskaya Oblast', it is mostly observed as an accompanying species s in the stand. Within the production site and in the adjacent parts of the Tobol'sk industrial zone, this species s is not observed due to the technological disturbance of the vegetation and absence of the suitable habitats.

The site for the proposed OOO "Tobol'sk-Polymer" enterprise is located within the production site of the existing enterprise of OOO "Tobol'sk-Neftekhim". Due to the industrial development of this territory, it has no primary plant communities that are common for the IV-th fluvial terrace of the Irtish. Instead, there are a lot of secondary aspen-birch forests, bush vegetation and pieces of the boggy meadows with thin bush vegetation. The areas, transformed by human activities, are grown with weed vegetation, with ruderal plant species prevalent.

Communities, that are similar to the primary ones, can only be found as small individual sections beyond the proposed production site. Most of the vegetation is comprised of secondary aspen-birch forests and bush vegetation. In addition, there are old fallows and bogged meadows with weed-grass and wet-grass sedge grass meadow communities including: colonial bent grass, bluegrass, meadow fescue, timothy grass, sedge, milfoil, daisy, hedge bedstraw, plantain, clover, and forest anthriscus.

This area also has bogged water settlements grown with a combination of willow stands and wet grass sedge grass cenosis such as: willows, some sedge grass species s, pine purple grass, common loosestrife, loosestrife, and blooming sally.

In 2008, ZAO Nordecho Eurasia and OAO Giprokauchuk conducted field studies of vegetation cover and flora on the proposed production site of OOO “Tobol’sk-Polymer” [28].

The forest cover is dominated by birch and individual aspen trees as separated forest stands among agricultural land. Pine woods are common on higher elevations. Tree species s include birch, aspen, and poplar. Bush includes hedge rose bush, and marsh cinquefoil. Wild fruit and berry species s include blackberry, strawberry, and roebuck berry. There are also various mushroom species s such as milk mushroom, rough boletus, aspen mushroom, coral milky cap, whitecaps, and honey fungus. The grass stand of the meadows is dominated by timothy grass, pine purple grass, ladyfinger, clover, and clump speedwell.

Fauna

The data of this section is based on literature and available official information of the state bodies. No special survey of wildlife in the close vicinity to the proposed production site of OOO “Tobol’sk-Polymer” was performed. The given data on the number of species s, density of population and etc. will differ from the actual ones since both the number of biological species s and their density in the industrial zone is much lower than those in the neighboring areas that were not disturbed by economic activities.

Description of wildlife of the Project area was based on the materials from the Tyumenskaya Oblast' Hunting Department and works by S.N.Gashev, the overview of which was published on his Web-site [40, 42].

Bird Fauna

Tobol’sky Rayon is located along the migration routes used by water birds flying through Siberia. It is the transit route for birds nesting in the Ob’ flood plain, its tributaries, in the Yamal and Gydansky Peninsular tundra, and wintering in Western Europe, Africa, and Asia.

Generally, spring bird counts on the 1-km wide accounting strip record from 5,000 to 25,000 water birds [3]. With normal spring weather, birds flow north with short stopovers. If a spring is long with cold spells, there might be backward migrations.

Ducks (pintail, mallard duck, dunbird, European wigeon, tufted duck, and bullhead) are among the most numerous group of water birds migrating through the Project area. Most migrating birds fly over this territory without long stopovers.

This gently sloping plain with spruce-fir-birch forests has few habitat areas for nestling or stopping of water birds –. The nearest large bog Chistoye-2 is located 25-30 km east of the industrial zone. It is located within the Abalaksky Natural Historical Complex, This bush-sphagnous bog with small lakes provides a set of good wildlife habitats used by water birds during their migration. During spring migrations, large numbers of geese

(laughing goose, and bean goose) could be observed there. Siberian white crane could also be observed here.

Since the time lag for the forecasts as recommended by UNESCO to assess the impacts of economic activities is 50 years, potential changes in the wildlife populations are assessed on the basis of baseline information for approximately the same period. The description of the baseline conditions are, primarily, based on the work by I.P.Laptev [32] and well known summary lists [48, 53 and other sources].

The population density assessment of these species s is based on the literature [3, (Antipov, 2001) and study data in the identical territories.

Fish Fauna

The Irtish and Tobol Rivers have relatively high fish productivity and valuable structure of fish fauna (the rivers are inhabited by Siberian white salmon, peled, Coregonus muksun, sterlet).

The fishery water resources in the south of Tyumenskaya Oblast' include 667 lakes with a total area of 236,000 ha, as well as rivers such as the Irtish, the Tobol, the Tavda, the Tura, and their small tributaries.

The fish fauna of the Irtish River has the following specific features:

- small number of commercial fish species s;
- numerous species s that are either of minor value (roach, perch, ruff, dace) or nuisance fish (gudgeon, stickleback, loach, mudfish);
- dominance of phytophilous group of fish;
- low species s diversity of plankton-eater fish.

The fish fauna of the Irtish River including the Tobol River (a tributary) has the following main fish species s: Coregonus muksun, pelet, Siberian white salmon, pike, nerfling, dace, perch, roach, freshwater cod.

Habitability of fish in the Irtish River and Tobol River depends a lot on the amount of precipitation in a specific year, duration and height of the flood plain flooding. The fish, which is adapted to avoid winter kill areas by migration, include nerfling, pike, perch, dace, etc. During frosts they migrate to the upper reaches of the tributaries where they can survive.

The fish of commercial value include pike, roach, dace, nerfling, silver and golden crucian carp, perch, ruff, and freshwater cod.

3.6. Protected Areas

In the north-eastern part of Tobol'sky Rayon, 3.5 km east of the boundaries of the OOO "Tobol'sk-Neftekhim" production site, which houses the production site of the proposed polypropylene plant of OOO "Tobol'sk-Polymer", is the state natural reserve of regional importance the Abalaksky Natural Historical Complex. OOO "Tobol'sk-Polymer" will have no negative impact on the ecosystems of the reserve.

The Abalaksky Natural Historical Complex was established in accordance with Federal Law No.33-FZ dated 14 March 1995 "On Protected Areas". Law of Tyumenskaya Oblast' No.303 dated 28 dated 2004 "on Protected Areas in Tyumenskaya Oblast'" and with the purpose of implementing the Tyumenskaya Oblast' Administration Resolution No.136-pk dated 25 10 2004 "on Approval of the Oblast Targeted Program for the Implementation of the Agreement between the Authorities of Tyumenskaya Oblast', Khanty-Mansiysky Autonomous Okrug – Yugra and Yamalo-Nenetsky Okrug No.150 dated 16 August 2004 "Cooperation" as amended on 22 August 2006.

The area of the natural reserve is 88,130.5 ha. The location of the reserve is indicated on the map in Annex 5.

The procedures for the establishment of the natural reserve with due consideration of the economic and natural specifics of Tobol'sky Rayon, goals for its establishment and its protection procedures are regulated by the "By-Law on the state natural reserve of regional importance the Abalaksky Natural Historical Complex (as amended by Resolution of the Tyumenskaya Oblast' Government No.213-p dated 11 September 2007.

The reserve includes the natural complexes of the right and left banks of the Irtish River within the boundaries of Tobol'sky Rayon such as the landscape, hydrological entities, forest vegetation, flora and fauna entities, and cultural sites.

With respect to the organization and operation of the Tobol'sky Rayon wildlife reserve, it is run and controlled by the Tyumenskaya Oblast' Department for Mineral Resources and Ecology.

In accordance with the Federal Law "On Protected Areas, within the reserve and its buffer zone, any activity is restricted or limited if it is inconsistent with the goals of the reserve or if it may cause damage to the natural complexes and components.

Existence of the wildlife reserve does not impose any constrains on the construction and operation of the proposed polypropylene plant of OOO "Tobol'sk-Polymer" since it is located at a long distance from the site.

3.7. Radiation Conditions

The study and assessment of radiation conditions were conduced in 2008 under the Geotechnical Studies. These studies were carried out in accordance with the Federal Law "On Radiation Safety of Population", 1995 and Law of the RSFSR "On Sanitary Epidemiological Wellbeing of Population", 1992.

The main sources of radioactive pollution of the environment include nuclear-technical installations, enterprises handling radionuclides, radioactive waste burial sites, traces of nuclear explosions, etc.

Radioactive pollutants include man-made radionuclides accumulating at the burial sites, authorized and unauthorized dumps, emergencies, uncontrolled leakages, and gas-particles emissions getting into soils and ground water directly from the construction site or in the course of migration from the adjacent areas.

Effects of radioactive radiation on live organisms depend on the penetrating and ionizing force of radiation. Human body is adapted to certain dozes of the ionizing radiation since man during one's lifetime is exposed to radiation by space and radioactive radiation coming from soil, structures, etc.

These doses should be strictly within the limits. Deviation from these doses (reduction or increase as compared with the norm) is dangerous to live organism.

Gamma Survey of the Sites. Gamma radiation is electromagnetic radiation (the flow of y-quanta) with a very short length of wave. Due to this, gamma-rays penetrate deeply into the human body and are very dangerous.

The field works included gamma-radiation survey on the proposed Project site (197 measurements). The strength of the exposure doze of the external gamma radiation on the land surface was measured with DRG-01m1 wide-range dosimeter. The gamma-radiation survey was conducted by 50x50 m mesh.

The extent of radiological safety is determined by the annual effective dose of radioactive radiation from natural and man-made sources. The effective dose of radiation from natural sources of radiation should not exceed 5 mSv/y [NRB-99, par.4.1 (Radiation Safety Standards)] and the effective dose of gamma radiation at a workplace should not be more than 2.5 mSv/h [NRB-99, par.4.1].

The levels of gamma radiation at the Project site are within the permissible limits changing within the range of 5 to 15 m Cr/y, which is 0.45 to 1.3 mSv/y.

"Radiation Safety Standards NRB-99"allow using soils, rocks and production wastes without limitation by radiation factor, provided that the effective dose does not exceed 370 Bq/kg. Production wastes, which SanPiN 2.6.6.1169-02 applies to, attribute to Category I, with $A_{eff} \leq 1.5$ kBq/kg, or gamma-dose rate $\leq$70 mcR/h.

3.8 Environmental Limitations

Environmental limitations are defined by the natural, climatic, socioeconomic and technological conditions of the area.

In pursuance of Federal Law dated 10.01.2002, № 7-FZ "On Environmental Protection", key environmental limitations apply to projects' siting within specially protected natural areas, such as: sanctuaries, natural reserves, important ornithological areas, cultural and architectural heritage sites, etc., within coastal buffer zones and fish protection zones, and highly polluted areas.

Environmental limitations and the relevant additional environmental measures are required in the areas inhabited by the Red Data Book flora and fauna species.

Moreover, intended activity's performance may be limited by the nature environment capability to bear technogenic loads without irreversible changes

The main parameters determining environmental limitations include:

- conditions for dispersing pollutants in the air;
- self-purifying capacities of water reservoirs;
- soils self-reclamation potential;
- extent, to which the environmental components are contaminated and disturbed;
- high environmental value of specific areas (protected areas, nature and historical sites);
- specific features of land use;
- availability of littoral buffer strips, water and fish protection zones.

By the air pollution potential, the Project area is characterized by average conditions of pollutant dispersion. It has relatively good wind patterns except for individual periods of time with maximum wind speeds and short bursts of wind.

The major water systems in the Project area, the Irtish and Tobol, have sufficiently high self-purifying capacity.

The production site of the proposed plant of OOO "Tobol'sk-Polymer" is located at the site of the existing enterprise OOO "Tobol'sk-Neftekhim". It is an area with soils and vegetation disturbed by human activities, with some portions of the site covered with secondary vegetation

The extent, to which the production site is polluted and disturbed, is such that it allows the construction of a new enterprise. According to the preliminary estimates, the size of the sanitary protection zone of the existing enterprise will not change after the commissioning of the new plant (1,000 m).

The new production site will not be part of any protected areas (natural reserves, game reserves, etc.) and it is located off littoral buffer zones, water or fish protection areas of the Irtish and Tobol rivers or their tributaries. Neither has it any valuable agricultural areas,

nor any valuable species s of trees, plants, and wildlife habitats recorded in the Red Data Book of the Russian Federation.

The Abalaksky Natural Historical Complex is located at a considerable distance from the enterprise (3.5 km east of the boundaries of the OOO “Tobol’sk-Neftekhim” production site) and its SPZ, and thus there will be no environmental limitations for the production activities of the proposed project.

Neither there are any environmental limitations associated with rare or endangered species s.

There might be rare visits of Red Data Book birds flying from time to time into the Project area from the nearby territories (the right bank of the Irtish and Abalaksky Natural Historical Complex). There are no other representatives of Red Data Book flora and fauna [29, 30] in the Project area.

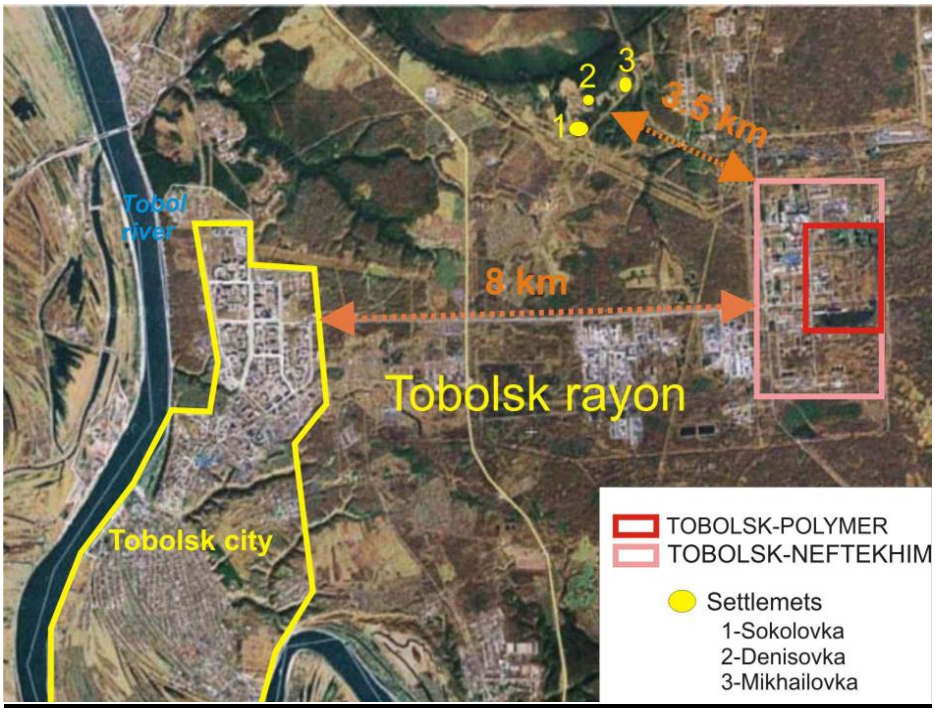
According to Letter No.655 dated 29 May 2007, of the Tyumenskaya Oblast' Committee for the Protection and Use of Historical and Cultural Sites [41], the production site of OOO “Tobol’sk-Polymer” does not include any cultural or historic sites of the Russian Federation.

4.0 SOCIOECONOMIC CONDITIONS OF THE AREA

URS's comments and proposals were taken into account, to the extent possible, based on data availability.

Geography

The polypropylene plant site is part of the industrial zone in Tobol'sk, Tyumenskaya Oblast'. The plant is located at 8-kilometer distance from the residential area of Tobol'sk. The nearest settlement to the production complex includes three villages (Sokolovka, Denisovka and Mikhailovka). This settlement is part of Tobol'sky Rayon and is situated about 3.5 kilometers off the plant.



4.1 Tobol'sky Rayon

The total area of Tobol'sky Rayon (Administrative district) is 1,722,153 ha. The Rayon stretches 187 km west-east and 175 km south-north. Covering most of the southern taiga area, the Rayon borders on Sverdlovskaya Oblast' in the west, on the Khanty-Mansiysky Autonomous Okrug in the north, on the Uvatsky Rayon and Vagaisky Rayon in the east, and Yarkovsky Rayon and Nizhy-Tavdinsky Rayon of the oblast in the south-west.

Tobol'sky Rayon has 119 localities under 22 rural settlements.

Landuse

Most of Tobol'sky Rayon area is occupied by marshes (797,380 ha or 46% of the total area) and forested land (the forested land share is 39.6%), with the agricultural lands accounting for 118,070 ha (6.8%).

Population

The population of Tobol'sky Rayon is 23,000 people. The population density is 1.3 person/km^2, which is lower than across the entire Tyumenskaya Oblast' (2.3 person/km^2).

The ethnical structure of the population is as follows:

- russians: 63%,
- tatars: 31%,
- ukrainians: 1,4%,
- germans: within 1%, and other nationalities.

In 2007, 519 people arrived and 536 people left the area, migration decrease was 17 people, while, in 2006, migration growth was 118 people.

Reportedly, within the entire Tyumenskaya Oblast' (excluding the autonomous districts), residents of active working age, under active working age, and over active working age make 65.8% , 17.2%, and 17.0% correspondingly.

Demography

Over the recent two years, the demographic situation in Tobol'sky Rayon as a whole has been improving. The negative growth rates are lower, though population keeps on declining. Natural growth statistics are shown in Table 4.1-1.

Table 4.1-1. Natural Growth Statistics in 2006-2007

Year	Birth rate	Mortality	Natural increase
2006	8,4	13	-4.6
2007	10,3	13	-2.7

The mortality rate is stable (13 persons per 1,000).

Cardiovascular diseases take the first place, with 178 deaths in 2007, and 175 in 2006. This is followed by deaths from injuries, poisons, and other external causes, with 41 deaths in 2007, and 40 deaths in 2006. Oncology ranks third, with 39 deaths in 2007, and 34 deaths in 2006. TB-caused mortality is practically stable: 10 deaths. There has been an increase in the active working age mortality due to oncology and cardiovascular diseases.

In Tyumenskaya Oblast', mean life expectancy is 66 years.

Economy

Industry

Forestry and food industries are the priority industries of Tobol'sky Rayon. The food industry is mainly represented by fish and bakery industries. The Rayon also has a well developed sector for the extraction of common construction minerals such as: sand, clay and peat.

Small business

The Rayon records 306 small businesses, including 106 legal entities and 200 individuals registered as self-employed entrepreneurs.

Agriculture

Farming is represented by 5 agricultural enterprises, 17 farms, 3,507 personal households, while meat and dairy products are the main business of 9 enterprises of different forms of ownership. Livestock husbandry activities are the prevailing farming activities. These include cattle and hog breeding. Crop growing is also well developed including spring crop, grains and pulse crop. Vegetable growing is not that developed.

Labor Market

Volume of employment in the economy of the Tobol'sk Rayon is 7 000 people.

As of January 1, 2008, the number of unemployed people registered by the state employment service was 546, while at the beginning of 2007 the figure was 836. In 2008, the registered unemployment rate was 4, 5% of economically active population that is 2.5% less than in 2007.

Infrastructure

Housing and Utilities

The Tobol'sky Rayon has 508,900 m^2 of the total housing floor space including 72,200 m^2 of municipality owned housing, 21,000 m^2 state owned housing, 415,700 m^2 private housing. It will be noted that 47,200 m^2 (about 10% of the housing) is in a bad state of repairs.

The Rayon also has 55 boiler houses including 37 municipality-owned ones. Only 22 houses are connected to gas supply networks. Over 9 months of 2007, the Rayon commissioned apartment houses with a total of 3,790 m^2 of floor space including individual houses with a total of 3,790 m^2 of floor space.

Healthcare

Tobol'sk operates 8 health care facilities with 1,267 beds, and 9 outpatient facilities, with 3,622 visitors a shift, and 2 feldsher-midwife stations. There are 410 physicians, and 1,435 nurses and medics.

Tobol'sky Rayon operates 5 hospitals, 8 outpatient facilities, 48 feldsher-midwife stations.

The statistics of the outpatient services include: visit to physicians: 48,115 including in the Rayon outpatient clinic: 22,343 visits. Physician assistants were visited 97,857 times including 14,601 in the rural outpatient facilities, and 63,114 in the feldsher-midwife stations.

The number of beds in the hospitals: 44 round-o-clock beds (therapeutic and pediatric treatment), and 25 beds for nurse care (fee-based).

Social protection of population

One focus of the social protection authorities is to facilitate self-employment of low income citizens of the Rayon (there are currently 66 families in Tobol'sk Rayon that are attributed to this group).

Another focus of the social protection authorities is the provision of social services to families with children. The database includes 28 families with 33 minors. There is a new form of providing jobs to minors through the social protection services – SVG. In 2007, 6 minors were provided with jobs through SVG. Education

In Tobol'sky Rayon, there are 23 secondary schools, 3 basic schools, 11 primary small schools, and 15 preschools, 5 boarding schools with 105 boarding students. Over the last several years, the number of school graduates who enrolled in the Tiumen higher educational facilities has been stable – 136 students or 46% including 36% of budget-financed students. The specialized colleges enrolled 123 school graduates or 40.7%, and technical schools had 25 school graduates or 8.4%.

Recreational Facilities

In 2007, there were 40 recreational facilities including — 23 community cultural centers, 17 village clubs. Tobol'sky Rayon operates mobile cultural facilities.

There are 29 libraries. Rural schools operate 26 gyms furnished with the sufficient amount of sports equipment.

There are four hotels in the city of Tobol'sk, one hotel meets international standards.

Transport

The main transport network in the Rayon includes the Tiumen-Tobol'sk-Surgut railway and motor ways of local and federal importance Tiumen-Tobol'sk-Khanty-Mansiysk, with a total length of 657.4 km.

The Rayon operates the railway stations called "Setovo" and "Suzgun", oil and gas pipelines, two oil pumping stations and one gas compressor station.

Public passenger service is provided by Tobolksy Passenger Motor Transport Company.

Bus routes run to 20 out of 22 rural settlements along 12 suburban and 9 intercity routes.

4.2 Tobol'sk

Tobol'sk is situated in the southern part of Tyumenskaya Oblast' at a distance of 254 km from Tyumen. The total area of Tobol'sk is 22,200 ha.

Population

In 2008 the total population of Tobol'sk (including surrounding settlements) was 104 000 people and has declined almost by 1.5% as compared to the beginning of 2005. The decline in population is mainly determined by migration outflow. Annually 400-800 more people leave the city than arrive there. In 2008 migration decrease was 414 people.

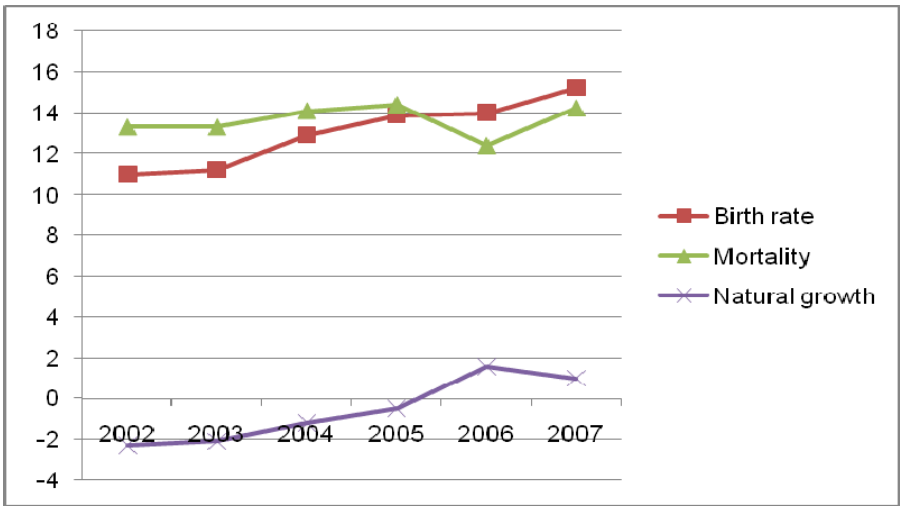
Out of the total population of the city, children and young people under active working age make 18%, older people – 13,2%. The share of young people in the general population of the city is the highest in the region, and the share of older people is the lowest. The share of population of active working age is 68.7%.

In 2007, the natural population growth was 102 people: born – 1525, lost – 1423.

Demography

The Tobol'sk city demography as a whole is improving (see Figure 4.2-1). While before 2005 inclusive, there used to be a natural negative growth of population, with a comparatively high children mortality rate (23.6 children per 1,000 population in 2004), in 2006 this indicator became positive, with the natural growth of population of 1.6%.

Figure 4.2-1. Demography statistics in 2002-2007 (per 1,000 population)



Public Health

Over the last five years, the city of Tobol'sk has demonstrated lower morbidity. From 2002 to 2006, the morbidity rate was reduced by 13% (from 1,505 people in 2002 to 1,299 in 2006).

Morbidity Statistics (persons) is presented in table 4.2-1.

Table 4.2-1. Morbidity Statistics in 2002-2006.

2002	2003	2004	2005	2006
1505	1473	1682	1230	1299

As for diseases classes, respiratory diseases rank first, followed by cardiovascular diseases across the entire population groups. In the age group of 0-14 years, infectious and parasitic diseases rank first, while in the age group of 15-17 years, these are musculoskeletal system diseases.

Morbidity according to classes of diseases for the Entire Population is shown in Table 4.2-2.

Table 4.2-2. Morbidity according to classes of diseases.

Classes of Diseases	Per 1,000 population	Ranging
Total	1299	-
Respiratory diseases	295	1
Cardiovascular diseases	197	2
Musculoskeletal system diseases	173	3

Children health is in a poor status. The share of practically healthy children is extremely low. In 2006, it was only 8.6% in schools and 24% in preschools. Overall children morbidity is very high and tends to grow. Throughout 2005, the share of practically healthy children (Group I) became 25% lower, while the share of Health Group III children demonstrated a strong increase (from 13.9% to 21.85%). The medical screening of children showed that the share of Health Group II children (comprising the so called boundary conditions such as: sickly, with faults in posture, flat foot, caries, chronic diseases in the past, and other conditions) is over 70%.

Economy

Industry

Tobol'sk is the main industrial center of the Rayon. Tobol'sk houses over 1,500 enterprises and 3,000 self-employed entrepreneurs operating in a variety of sectors. Along with companies operating in the sector of trade, public catering, services, vessels construction, communal and housing services, there are 70 enterprises that produce a wide range of manufacturing products, 200 construction companies, and 31 transport companies. Tobol'sk has a well developed petrochemical, light, food, flour and cereals, printing, wood working industries, as well as building industry and mechanical engineering sector. Tobol'sk enterprises produce the following main products: liquefied hydrocarbon gases, gasoline for the chemical sector, butadiene, methyl ether, heat, electricity, stone wool insulated pipes, forged metal, a wide range of building materials, wood products, prefab reinforced concrete products, clothing and fur products, footwear, ivory articles, whole milk products, fish and fish products, confectionery products, bread and bakery products, soft drinks and other consumer goods.

Small business

As of 1 October 2007, the city numbered 3,362 small businesses registered including 357 legal entities and 3005 self-employed entrepreneurs.

Labor Market

Rate of employment in the economy of Tobol'sk is 75% of employable population mainly involved in service sector.

As of January 1st 2008, there are 805 unemployed people the registered by the state employment service .

In Tobol'sk, unemployment is 1.67% of economically active population; 63% of the unemployed are women.

The mean actual pay per one worker in large and mid-sized enterprises was RUR 14,422 in January-August 2007. Against the same period of 2006, it grew by 21.8%, and against 1999 the increase was 90%.

Infrastructure

Housing and Utilities

In Tobol'sk, the total housing floor space is 2,408,700 m^2, with 23 m^2 of the total floor space per one inhabitant. The area under decrepit and poorly kept housing is 54,700 m^2 accommodating 1,389 families. Not all households are connected to the gas supply.

In Tobol'sk, there are 9 apartment houses under construction, with a total area of 63,000 m^2. This year, the city intends to commission 7 apartment houses and individual houses with 942 apartments and total number of floor space of 43,200 m^2 including 6,000 m^2 for individual houses.

Healthcare

Tobol'sk operates 8 health care facilities with 1,267 beds, and 9 outpatient facilities, with 3,622 visitors a shift, and 2 feldsher-midwife stations. There are 410 physicians, and 1,435 nurses and medics.

Social protection of population

In order to provide specific assistance to low income employable families, the city of Tobol'sk developed and initiated an oblast program "Self-employment". The City Interagency Commission organizes, coordinates and controls the efforts to ensure self-employment of low-income families. For instance, 9 months of 2007 saw 169 people who wanted consultation and clarifications. The Department of Social Development received 25 individual plants worth RUR 775,000 for review and approval.

Education

In Tobol'sk, there are 26 schools and 27 preschools, with over 20,000 students. The city has over 20 institutes and colleges.

Recreational Facilities

Tobol'sk operates 6 clubs and resort centers, 12 libraries. The city has the state historical-architectural reserve museum. The number of health & fitness centers is 9 units.

Cultural Inheritance Sites

There are no cultural inheritance sites on the Project site. (Conclusion by the Tyumen' Oblast' Committee for Cultural Inheritance Sites' Protection and Use, dated 29.05.2007 №665).

There are over 300 historical and cultural sites in Tobol'sk including 35 sties of federal importance. There are 16 cathedrals, monasteries, and parish churches. There are also Ivanovsky International Monastery and Abalaksky Monastery.

The major cultural inheritance sites of the Tobol'sk Rayon are Siberian orthodox sacred places, pilgrimages: serving Abalaksky Svyato-Znamenskii Monastery (12. 5 km off the Project site) and Ioanno-Vvedenskii Nunnery (6.5 km off the Project site).

5.0. ANALYSIS OF THE PROJECT ALTERNATIVE OPTIONS

To avoid environmental and economic risks, at the early stages of the proposed project, its sponsors review the project alternatives and conduct a comparative analysis of the technical, economic, and environmental indicators of the project options.

The project alternatives are described from the point of view of:

- options of the polypropylene plant's siting;
- technological options used in the polypropylene production;
- "Do nothing" option (declining the project proposal).

5.1. Justification of the project siting

The polypropylene plant's siting depends on the following main factors:

- availability of a polypropylene feedstock source located near the site;
- sufficient amount of energy resources required for the proposed production facility;
- long distance from residential areas;
- developed infrastructure (utilities, transport system, warehouses for feedstock and finished products);
- availability of free labor resources including favorable conditions to staff the new production plant with skilled personnel.

OOO «Tobol'sk-Neftekhim» was selected for the Project location because it had the following good points:

- the project site is close to the feedstock source enabling the propane cut to be pumped through a pipeline directly to the propane dehydration unit of OOO Tobol'sk-Polymer. This will prevent the emission of hydrocarbons into the air that may take place during the storage of liquefied propane and loading it into the car-tanks for the delivery of the product to the consumers by rail. This will also decrease the cost of the feedstock transportation to the processing site.
- there was sufficient amount of reserve energy resources (natural gas, steam, hot water);
- there is enough free space enabling the location of the new production facility;
- there is sufficient reserve capacity to receive and treat wastewater;
- there is sufficient reserve landfill capacity for waste disposal;
- there is developed infrastructure (water supply facilities, sewerage, treatment facilities, the systems for the supply of heat, electricity, compressed air, nitrogen, transportation system, intermediate storage facilities).

There are no environmental limitations associated with the availability of rare or endangered species s in the territory of the new production facility.

There might only be rare instances of the "Red Data Book" birds flying from time to time into the Project area from the nearby territories (the right bank of the Irtish and Abalaksky Natural Historical Complex). In the Project area, there are no other representatives of Red Data Book flora and fauna.

Therefore, the new production facility's siting within the production site of OOO «Tobol'sk-Neftekhim» will not result in any serious increase of the load on the environment in the Project area.

5.2. Technological Options

The polypropylene production facility consists of two technological processes:

- dehydrating propane to make propylene;
- polymerizing propylene to make finished products: polypropylene of different brands.

The tender process for the procurement of equipment for the new production facility, SIBUR reviewed proposals from the manufacturers of propane dehydration equipment such as:

- ABB Lummus (Catofine process);
- Universal Oil Products (Oleflex process); and

proposals from the manufacturers of polymerization technologies:

- DOW Chemical (Unipol Process);
- INEOS (Innovin process);
- BASELL (Spheripol process);
- NOVOLEN (Novolen process).

Justification for Propylene Dehydration Process Technology Option

The Oleflex technology was opted for since it has a number of advantages:

- under this technology, there is no need to move (compress) large amounts of air, or to heat air, burn contaminated emissions, or recover the off-heat from an individual air heating cycle;
- the Oleflex process was tested in the industry. The actual data from the operating installations confirmed the stated performance indicators of the Oleflex process throughout the entire catalyst service life. The Oleflex catalyst formulation turned out to be more stable than the Catofine catalyst formulation and this ensures that the manufacturer's capacity of the installation will be maintained over time.
- the Oleflex process has a better selectivity (averaged by time) towards propylene and requires less steam for its operation. As a result, the Oleflex installation emits much less CO2 per ton of propylene as compared to the Catofine installation.

Justification for Propylene Polymerization Technology Option

The Innovin propylene polymerization process (INEOS) was opted for since this technology:

- is unique with the process of ideal desaturation for the production of homopolymers with the best qualities in their own class;
- has the highest efficiency factor of the installation (96%) placing the technology as No.1 candidate by actual costing of $6 US million a year as compared to the competing technologies;
- has the highest reliability and safety ratio;
- is energy saving; the energy consumption indicator of the technology is one of the lowest in the sector. The gas phase technology does not require a lot of steam for the technological needs and as such does not require additional energy consuming equipment. This will help reduce operational expenses to a considerable extent and reduce the amount of emissions into the air including the GHG emissions.

From the point of view of environmental impacts of this technology:

- it generates small amount of pollutants' emissions and discharges into the air and on soil; when preparing the catalyst, the process uses limited amount of chemical agents and treatment stages. The gas phase polymerization reduces the potential amount of liquid discharges;
- in case of an emergency stoppage due to the electricity cutoff, a major blowout of the reactor content to the flare will be average by amount (for the projected processes), with only the gas phase to be discharged from the reactor. The frequency of such potential blowout is once every 25 years, with the duration of the blowout of up to 30 minutes.

Thus, the Oleflex propane dehydration process (UOP) and Innovin propylene polymerization process (INEOS) were selected as the best options by both economic performances and by safety indicators for the environment and man.

5.3. Project Refusal ("Do nothing" Option)

Though it might be viewed as environmentally attractive, the zero option will lead to:

- an incomplete use of the production capacities and the territory of the Tobol'sk Production Cluster, processing of the raw materials with lower value and this may have a negative impact on the economic efficiency of the existing production facility;
- an inability of using free labor resources and, as a result, inability of creating more jobs;
- loss of substantial payments to the budgets of all levels preventing effective funding of many social programs in the region;
- an inability of establishing additional enterprises around the new production facility both during the Project construction and its operation, such as transport organizations, manufacture of various products from polymers to be produced, expansion of the service sector, etc. Establishing such small and medium-size companies around the new production facility may also help address social problems in the region (creating new jobs, improving the quality of life, etc.) and more payments to the budgets of all levels.

The polypropylene production project will reduce the emission of pollutants into the air.

As indicated earlier, locating the new production facility at the production site of OOO «Tobol'sk-Neftekhim» will not result in any serious increase in the environmental loads. Moreover, it may reduce, to some extent, air emissions. Therefore, given the projected positive social and economic effects from the operation of the new enterprise, the project refusal is not desirable.

6.0. PROJECT IMPACT ASSESSMENT ON NATURAL AND SOCIAL ENVIRONMENT

6.1 Impact during construction stage

Impact on the atmospheric air

The major adverse impact on the atmospheric air during the construction stage will be produced by:

- mobile pollution sources – construction equipment, transport;
- Emissions during welding and paintwork performance.

The major volume of air pollutants' emission during construction-installation works are common industrial polluting substances: nitrogen oxide and dioxide, carbon oxide, sulfur dioxide, soot, suspended solids.

Emissions during welding works will be: iron oxide, manganese oxide and its compounds, inorganic dust, gaseous fluorides. During paintwork the air emissions will include acetone, white spirit, xylene, toluene, etc.

The volume of pollutants emitted into the atmosphere during the construction works will be defined at the stage of the design documents' preparation.

The construction stage will last about 2 years. In general, the impacts will be of temporary and local character.

As said above, the major adverse impact on the atmospheric air will be caused by construction equipment and transport: excavators, bulldozers, etc.

Reduction of air pollutants emission may be provided, where applicable, by timely and effective maintenance of vehicles and equipment, regular diagnostic analysis of exhaust gases from transport.

For dust reduction in the summer time, it is planned to arrange periodic watering of roadbed and bulk substances temporarily stored in the open areas, which may be dust sources, to limit speed of transport movement on unpaved roads, to set up wheel washing areas, etc.

No blowout emissions are expected in the normal mode of construction works.

Impacts related to motor transport flow and special machinery operation during implementation of preliminary, earth-moving, construction-installation and the related operations will be insignificant and short-time at the background of the major amount of vehicles daily visiting the sites of OOO «Tobol'sk-Neftekhim» and the TPP.

Acoustic impact

The main impact factors at the construction stage are noise and vibration produced by operating equipment during site preparation. Such impacts are unavoidable in the construction process. In accordance with the health and safety regulations, various measures will be implemented, for example, using personal protective equipment (PPE) by the workers.

The main measures for noise impact reduction will include supervision and implementation of management measures, such as limitation of very noisy equipment use and reduction of its operation time.

Noise impact during construction will also be insignificant and short-time at the background of the process noises produced by other production facilities of the industrial zone.

Impact on soil and land resources

The project shall provide for removal and temporary storage of fertile layer of soils with surface humus-accumulative horizons (they were contoured at the stage of pre-design surveys [28]). Fertile layer, which is removed from plots allocated for buildings, coverage, infrastructure (permanent land withdrawal) may, as agreed between the land users/land owners and the local supervisory authorities, be removed to other territories and used there for reclamation. On other plots, which are to be vegetated or covered with other elements of environmental infrastructure (land improvement), the fertile soil layer is removed temporarily to be returned to the stripped area upon completion of the construction-installation works. Thickness of the fertile layer on such plots may be artificially enlarged with the material removed from the site territories under construction.

Local contamination of construction sites and the adjacent areas with combustibles (mainly oil products) may occur as a result of movement, operation and maintenance of construction equipment and vehicles.

The kind and the level of spilled oil products' impact on topsoil due to inaccurate maintenance or fuelling of motor transport are determined by composition of soil cover species s, the spill or the leakage volume, the season and other factors. Oil contamination of soils brings to disturbance of soil biota activity: particularly, changes of microorganism species s' composition (usually it tends to degradation), suppression of destructive biochemical processes, changes of natural compounds' metabolism (this mainly apply to biogeochemical cycles of nitrogen, hydrocarbon and other biophilic elements) decrease of fermentation activity of soils. Compliance with the building standards applicable in the RF will minimize the risk of the adverse impacts on soil cover.

To respond to emergency spills and leakages of hazardous chemicals, the project shall provide a specific action plan including technical support (equipment for contaminated soil collection and removal), logistical support (an agreement with a licensed company for contaminated soil disposal or cleanup) and the relevant human resources support (responsible persons, an environmental monitoring team).

Earth works on the site will inevitably provoke discharge of a certain amount of suspended solids into the local valley network. Given that there are no water courses near the production site, significant increase of turbidity and pollutants' concentrations in the rivers of the project area is not expected. The project shall provide melioration and drawdown

measures to prevent flooding and a number of adverse effects of high watering of soils on the site.

Physical-mechanical impacts of construction on topsoil of the adjacent areas may and must be fully excluded, and chemical impacts (such as soil contamination with components of exhaust gases released by construction equipment, local heating and life support systems) – to be minimized. In major extent, this will be provided by using the existing road network and other infrastructure.

Mitigation of impact on soil and land resources at the construction stage will also be accomplished by: work performance strictly within the construction sites; daily collection and storage of wastes in specially allocated areas, use of the existing roads for cargo delivery.

Construction and further operation of the production facilities will not cause additional specific impacts on topsoil of the adjacent territory and will not bring to significant increase of the present impacts' intensity.

Any additional physical-mechanical soil disturbances beyond the site of OOO «Tobol'sk-Polymer» related to implementation of the intended activity are impossible, as it is planned to use the existing roads and other infrastructure.

Impact on groundwater

During the construction stage the impacts on groundwater may be as follows: decrease or increase of infiltration as a result of soil and vegetation withdrawal; infiltration of pollutants into soil due to improper storage; distortion of groundwater flow.

On condition that the required measures are implemented: spill prevention, compliance with rules of materials' storage and use, waste storage, design regulations, the impact on the groundwater during the construction stage is permissible.

Environmental impact of wastes during construction

Within the period of the project construction the below main types of wastes will be generated:

- construction wastes generated in the process of construction sites' preparation and general construction works' performance, transport maintenance, (waste bricks, scraps of concrete and reinforced concrete, waste paintwork materials, spent welding electrodes and weld slag, waste soil etc.);
- solid domestic wastes generated in the process of the construction personnel activities, (domestic garbage, territory cleanup wastes, waste working clothes, rags, etc.).

To minimize waste disposal volume and to mitigate the wastes' impact on the environment, the wastes are to be transferred to specialized companies for utilization.

Special areas for collection and temporary storage of wastes (for the period of accumulation of sufficient amount for their transfer to the licensed companies) will be arranged to prevent mixing wastes of different hazard classes.

With regard for the above impact mitigation measures and on condition of implementing monitoring measures, the impacts associated with waste management in the process of construction may be assessed as acceptable.

Social impact

During the peak periods of construction works there will be up to 4000 workers present on the site. The project provides for constructors' accommodation in two specially built construction camps, which exact location was not identified during the ESIA preparation. The camps will have all the required conveniences for employees of OOO «Tobol'sk-Polymer» and the contracted organizations.

The distance between the camps and the boundary of the city of Tobol'sk will be not less than 10 km.

6.2 Impact during operation stage

Impact on the atmospheric air

Characteristics of the Plant as a pollution source

In accordance with the design documentation provided by the Client [47], the major sources of polluting substances (PS) emission into the atmosphere during operation of OOO «Tobol'sk-Polymer» will be:

- Chimneys of boiler units – *sources № 1-3;*
- Chimney of propane dehydration unit (PDU) – *source № 4;*
- Chimney of the fume gas purification system – *source № 5;*
- Emissions through leaks of propane dehydration equipment – *source № 6;*
- Emissions through leaks of polypropylene synthesis unit (PSU) – *source №7;*
- Flare of PDU – *source №8;*
- Flare of PSU – *source №9.*

Air emissions point sources locations (projected) are shown at the general layout. (Annex 4)

The table of parameters of the projected air pollution sources is given in Annex 15.

OOO «Tobol'k-Polymer» is supposed to emit 15 air pollutants subdivided in two groups of substances producing summative adverse impact, of the total mass 40,57 t/y.

The hygienic and qualitative characteristics of pollutants emitted into the atmosphere during OOO «Tobol'sk-Polymer» operation is given in Table 5-1.

Table 5.0-1. List of pollutants emitted into the atmosphere

№	Substance	Code*	MPC max/time, (MPC daily average), [TSIL], mg/m3	Hazard class	Gross emission, t/y
1	Nitrogen (IV) oxide (Nitrogen dioxide)	0301	0,2	3	19,3
2	Nitrogen (II) oxide (Nitrogen oxide)	0304	0,4	3	6,34
3	hydrogen chloride	0316	0,2	2	8,2
4	sulfur dioxide	0330	0,5	3	2,08
5	hydrogen disulfide	0333	0,008	2	0,058
6	carbon oxide	0337	5	4	136,5
7	Chlorine	0349	0,1	2	16,08
8	Butane	0402	200	4	1,38
9	Methane	0410	[50]	-	51,9
10	Isobutane	0412	15	4	0,029
11	Mixture of saturated hydrocarbons C1-C5	0415	[50]	-	1,3
12	Propene (Propylene)	0521	3	3	15,3
13	Ethylene	0526	3	3	1,9
14	Benzene	0602	0,3	2	0,0084
15	Methanol (methyl alcohol)	1052	1	3	0,029
	Summation groups				
16	Nitrogen dioxide+sulfur dioxide	6009	-		-
17	sulfur dioxide +hydrogen disulfide	6043	-		-
	Total:				260,4

Note: * - codes of the substances are given as per «List and codes of atmospheric air pollutants», version6, St Petersburg, 2005..

The following substances will be emitted into the atmosphere during OOO «Tobol'sk-Polymer» operation:

a) pollutants - 15 , out of these:

hazard class II – 4;

hazard class III – 5;

hazard class IV– 4;

with established TSIL – 2.

b) summation groups – 2.

Measures for reduction of air pollutants' emissions

To reduce air pollution the following measures are provided:

- limitation of volatile hydrocarbons' emissions by reducing the number of flange joints and application of high quality sealing materials;
- use of pumps with mechanical double-seal; electromagnetic coupler, or equivalent pumps with leakage prevention systems. Single-seal pumps may are not allowed for operation with hydrocarbons.
- use of close-type drainage system for minimization of volatile hydrocarbons' emissions;
- operation of motor- and rail transport with obligatory diagnostics.

Maximum permissible emissions (MPE) will be established for all pollutants emitted by the plant. MPE monitoring will be carried out by an attested laboratory in accordance with the monitoring schedule and monitoring points.

Measures for supervision over compliance with MPE norms will be specified and agreed upon with the regional branches of Rosprirodnadzor RF, Rostekhnadzor RF and Rospotrebnadzor RF.

Calculation of air emissions

Calculation of pollutants' emission into the atmosphere expected during operation of OOO «Tobol'sk-Polymer» was based on preliminary data.

Parameters of some air pollutants' emission sources (heights of smoke-stacks, their diameter, gas-air mixture emission speed, volumetric flow rate, etc.) are assumed based on similar projects' data;

Auto transport and railway transport were not taken into account as air pollution sources during the ESIA, because by the time of the document preparation no final decision on transportation had been taken.

When making a calculation of pollutants' dispersion, the atmospheric air pollution caused by operation of OOO «Tobol'sk-Neftehim» was regarded as background pollution (as per the data of Tobol'sk unified hydrometeorological station).

Calculation of ground level concentration of pollutants

Explanation of calculations

Meteorological characteristics and coefficients determining conditions of pollutants dispersion in the atmosphere are presented in Table 5-2.

Table 5-2. Meteorological characteristics and coefficients determining conditions of pollutants dispersion in the atmosphere

Characteristics	Value
Coefficient depending on temperature stratification of the atmosphere, A	200
Terrain relief coefficient	1
Average maximum ambient air temperature of the hottest month, °C	+23,6
Average maximum ambient air temperature of the hottest month, °C	-24,5
Frequency (%) of wind directions and stills for year:	
N	12
NE	5
E	9
SW	16
S	14
SW	16
W	15
NW	13
Still	11
Wind speed (by long-tem data), which exceeding frequency is 5%, m/s	7,0

Air pollutants' dispersion computation was made with software product "Ecolog", version 3.10 designed by NPO «Integral» of St. Petersburg and approved by the Voeykov Hydrological Observation Centre

Calculation of concentration fields was made using a grid of 350×350 with 50 m spacing - to identify concentrations of pollutants at the border of SPZ established for OOO «Tobol'sk-Neftekhim», which site will accommodate OOO «Tobol'sk-Polymer», and at the border of the residential area.

Direction of axes of coordinates: OX – to the East, OУ – to the North.

Ground level concentrations of pollutants, which will assumingly exist within the residential area during OOO «Tobol'sk-Polymer» operation, are identified for assessment of the level of the plant's impact on the atmospheric air quality.

To indentify the project impact on the atmospheric air the below calculation points (CP) were selected:

- CP4, 5, 6 – at the border of SPZ established for OOO «Tobol'sk-Neftekhim;
- CP1 - at the border of the nearest residential area of Tobol'sk;
- CP 2 – v. Sokolovka;
- CP 3 - v. Denisovka;
- CP 4 – v. Mikhailovka.

Results of calculations of pollutants' ground level concentrations in the atmosphere are presented in Annex 6.

Analysis of the dispersion calculation results

Calculations of pollutants' ground level concentrations in the atmosphere were made for summer time.

Analysis of the dispersion calculation results with regard to all monitored pollutants showed no exceedances of hygienic norms set for community air (MPC, TSIL),.

Maximum ground level concentrations during the most adverse conditions for air emissions' dispersion with regard for the background concentrations are considerably lower than the MPCs in the monitoring points at the border of SPZ established for OOO «Tobol'sk-Neftekhim and in the residential area.

Results of calculations of expected ground level concentrations of pollutants emitted into the atmosphere by pollution sources are presented in textual and graphic forms (isolines of ground level concentrations indicated on a map) are given in Annex 6.

The impact area limited with isoline of 0,05 MPC was identified for three polluting substances: chlorine, chlorine hydride and hydrogen disulfide. The borders of the mentioned pollutants' impact zones are shown in Annex 7.

In accordance with amended SanPiN 2.2.1/2.1.1.1200-03, OOO «Tobol'sk-Polymer» refers to hazard class I production facilities with approximate sanitary protection zone of 1000 m.

The issue of necessity to adjust the sanitary protection zone established for OOO «Tobol'sk-Neftekhim» in connection with accommodation of OOO «Tobol'sk-Polymer» on its site will be addressed during the design documents' preparation.

Conclusions

The analysis of results of the dispersion calculation based on the initial data showed that OOO «Tobol'sk-Polymer» impact on the atmospheric air is expected to be within the permissible limits and in compliance with the requirements of the sanitary norms and regulations on the atmospheric air protection.

Construction of the polypropylene production plant will make possible to reduce air pollutants' emissions from OOO «Tobol'sk-Neftekhim» production facilities. This is due to the fact that OOO «Tobol'sk-Neftekhim» will supply the new plant with the primary product (propane fraction), which will be delivered directly to the process units of OOO «Tobol'sk-Polymer».

Acoustic Impact

The main noise sources at the project site are process and flare units.

According to the data of the licenser, equivalent level of sound load of the process units does not exceed 92 dBA, the propane dehydration flare unit – 87 dBA (in the flare zone at the distance of 150 m), the polypropylene synthesis flare unit – 88 dBA (in the flare zone at the distance of 75 m).

In accordance with international standard ISO 8297, the noise characteristics of the project is assessed based on the corrected level of sound power (L_{PA}, dBA).

Corrected level of sound power the project site is calculated with the following allowances:

- Regardless of noise level reduction by the environmental elements;
- Regardless of process noise by OOO «Tobol'sk-neftekhim» and transport.

Tentatively, at the stage of the ESIA documents preparation, the value of the corrected level of sound power may be assumed basing on the data designer's reference book "Noise control in urban planning" (Table 23).

Due to the absence of exact analogs of the polypropylene production plant, the project's acoustic impact on the environment is based on the data of table 23 "Noise control", where the maximum design value of the corrected level of sound power – 120 dBA (the analog is a tractor production plant) as the worst case.

The below settlements of the closest location to the project site are regarded as calculation points:

- CP 1 – at the border of the nearest residential area of Tobol'sk;
- CP2 – v. Sokolovka;
- CP3 –v. Denisovka;
- CP4 – v. Mikhailovka.

The sound level L_A, dBA in the calculation point at the territory of the nearest residential area is calculated by the formula:

$L_A=L_{PA}-10\lg\Omega-20\lg r-\Delta_{Ar}+\Delta L_{отр}-\Delta L_{CA}$,

where

L_{PA} – the project's corrected level of sound power (analog – 120 dBA);

Ω – spatial angle, where noise goes to; as the noise sources are located in space, then 10 lgΩ=11 dBA;

r – distance, (m), from the acoustic center to the calculation point; r1=8500 m; r2=4700 m; r3=5000 m; r4=4500 m;

20lgr1=78,6 dBA 20lgr2=73,4 dBA 20lgr3=74,0 dBA 20lgr4=73,1 dBA;

Δ_{Ar} – correction, dBA for acoustic absorption in the air, where r over 2000 m Δ_{Ar}=10 dBA (fig.7 «Noise control…»);

$\Delta L_{отр}$ – correction for sound reflation, dBA in the absence of reflecting surfaces located at the distance less than 0,1r; $\Delta L_{отр}=0$;

ΔL_{CA} – additional decrease of noise level by the environmental elements; in our calculation $\Delta L_{CA}=0$.

The sound level in the calculation points will be:

CP1 - L_{A1}=120-11-78,6-10=20,4 dBA;

CP2 - L_{A2}=120-11-73,4-10=25,6 dBA;

CP3 - L_{A3}=120-11-74-10=25,0 dBA;

CP4 - L_{A4}=120-11-73,1-10=25,9 dBA.

The calculated noise levels are considerably less than the noise level in the area adjacent directly to residential houses: 45 dBA – in the night time, 55 dBA – in the day time.

The calculations allow a conclusion that the project's acoustic impact is supposed to be within the permissible level.

Impact on surface water quality

Main options for water supply

To provide water supply for OOO «Tobol'sk-Polymer» the existing water supply systems of OOO «Tobol'sk-Neftekhim» [47] are to employed.

Water is to be supplied for:

- production process (circulation water supply systems for production units for propane dehydration and polypropylene production);
- firefighting systems;
- sanitary needs.

The volumes of water supply for OOO «Tobol'sk-Polymer» are agreed with OOO «Tobol'sk-Neftekhim» (letter of 01.12.2008 №22/12578) as follows:

- make-up water for the recycled water supply of the process units (filtered water) – 700 m3/hr;
- water for demineralized water preparation (clarified water) – 70 m3/hr;
- drinking water – 50 m3/hr.

In addition to using the existing water supply systems of OOO «Tobol'sk-Neftehim», it is planned to replenish the water supply units with treated storm and snow waters. These are collected, treated and sent to the process cycle.. Thus, fresh water consumption for make-up of recycled water supply of process units will be minimized.

Wastewater discharge

Sources of wastewater generation during operation of OOO «Tobol'sk-Polymer» will be production units, offices, laboratory rooms, storage facilities, parking areas, tank farms [47].

The following types of wastewater will be generated during the production process:

- Chemically polluted wastewater – water polluted with reagents used in the production cycle;
- Sanitary wastewater;
- Storm water.

At OOO «Tobol'sk-Polymer» it is planned to design three independent sewage systems for:

- chemically polluted wastewater;
- unpolluted storm water;
- sanitary wastewater.

Chemically polluted wastewater goes via the industrial sewerage system to a separate sewerage well, where an on-line analyzer of pollutants' concentrations will be installed. After the wastewater quality testing for compliance with the established standards, the water is pumped to the industrial sewerage system of OOO «Tobol'sk-Neftekhim».

Storm water from the site or fire water will be delivered to the industrial sewerage system within the first 20 minutes, as during this time the wastewater may contain various oils and other pollutants from the production site. All the subsequent storm water will be delivered into a big tank for settling. If the water meets the quality standards, it will be pumped to the storm water drainage system of OOO «Tobol'sk-Neftekhim».

Sanitary wastewater will be sent to the sanitary sewage system of OOO «Tobol'sk-Neftekhim».

Wastewater treatment

The basis for discharge of wastewater from the project site to treatment facilities of OOO «Tobol'sk-Neftekhim» are the relevant Agreement and Technical Specifications.

The volumes of wastewater discharge from units of OOO «Tobol'sk-Polymer» are agreed with OOO «Tobol'sk-Neftekhim» (letter by OOO «Tobol'sk-Neftekhim» of 01.12.2008 г. №22/12578) as follows:

- chemically polluted wastewater – 75 m3/hr;
- sanitary wastewater – 50 m3/hr;
- storm water – as per the design norms.

Local wastewater treatment system of propane dehydration unit

Wastewater from washing systems and storm water systems is accumulated in settlers of the propane dehydration unit and pumped to setters of the local wastewater treatment system. Each settler is equipped with surface and bottom partitions preventing light and

heavy hydrocarbons' entry with water. Heavy hydrocarbons will be mechanically removed as accumulated from the surface and bottom partitions. Hydrocarbons will be delivered to OOO «Tobol'sk-Neftekhim» for utilization.

Local wastewater treatment system of polymer polarization unit

Continual and periodic wastewater flows from the polymer polarization unit polluted with oil products and polymer granules are sent to preliminary treatment by two ways.

Wastewater polluted with hydrocarbons is drained into a holding tank. Then, via a water outlet the wastewater goes to a basin for settling and removal of oil products and various suspended solids. The wastewater free of oil products and suspended solids goes to wastewater treatment facilities of OOO «Tobol'sk-Neftehim» for supplementary treatment.

Wastewater polluted with polypropylene will go to a basin equipped with a mesh for catching polymer chips and granules. Polypropylene returns to the production cycle. The water goes to the polluted wastewater treatment system and then is delivered to the industrial sewerage system of OOO «Tobol'sk-Neftehim».

The Utilities, Infrastructure & Offsites Storm water system

Storm water from various production sites of the plant will be accumulated in subsurface water sumps. After testing for concentration of hydrocarbons the storm water will go to the existing wastewater treatment facilities of OOO «Tobol'sk-Neftekhim» either via the storm water drainage or the chemically polluted wastewater sewage.

Storm water from non-process zones are accumulated and sent via drainage channnels located along the site perimeter to the existing storm water drainage of OOO «Tobol'sk-Neftehim».

Brief description of OOO «Tobol'sk-Neftekhim» wastewater treatment facilities

OOO «Tobol'sk-Neftekhim» operates a closed cycle for treatment of chemically polluted, process and sanitary wastewater. Over 90% of wastewater after treatment is sent to reuse as make-up water for cooling towers of recycled water supply. The design capacity of the wastewater treatment facilities is 66 thou m^3/d, the actual annual average load now is less than half of the design capacity – 24 000 m^3/d.

OOO «Tobol'sk-Neftekhim» wastewater treatment facilities were designed for treatment of sanitary wastewater from the plant and the city of Tobol'sk (on contractual basis with Vodocanal) and process wastewater.

<u>Measures for mitigation of impact on surface water</u>

The following measures are provided for surface water protection [47]:

- residual products containing high quantities of hazardous substances will be disposed via closed systems;

- mineral and lubricating oils discharge with wastewater will be excluded. The oils will be collected in drums and other containers from where they can by easily removed;
- pipes for disposal of wastewater containing polymer granules and chips will be equipped with bunkers having a mesh for separation of polypropylene particles;
- aluminum triethyl will be stored in sealed containers and indoor only to protect it from precipitations. Aluminum triethyl storage areas shall not be directly connected with wastewater disposal systems;
- territories, which accommodate holding tanks with flammable liquids, chemicals will be enclosed along the perimeter.
- process wastewater, snow, storm water runofs and sanitary wastewater will be disposed to sewerage system and transferred for treatment and utilization to OOO «Tobol'sk-Neftehim» on a contractual basis;
- water consumption and wastewater discharge will be metered.

Conclusions

Surface water may be impacted through its pollution with process and domestic wastewater in case of untreated wastewater discharge to the land or a surface water body.

Generally, during the new plant's operation, taking into account its new environmentally sound technologies that are to be implemented, wastewater transfer to wastewater treatment facilities of OOO «Tobol'sk-Neftekhim», the provided environmental protection actions and the proposed monitoring of technological equipment operation, the impact on surface water quality will be minimized.

Waste impact on the environment

Project description as a source of waste generation

The sources of waste generation of the main production are technological process and areas: primary products' preparation, polypropylene manufacture, packing, commercial product storage [47].

The following types of wastes will be generated:

- spent catalysts (solid – from propane dehydration and selective hydration of semi-finished product and liquid – from polymerization process);
- solid catalyst dust (from processes of propane dehydration and selective hydration);
- spent sorbents used for absorption of adverse mixtures in raw materials and semi-finished products;
- granules and chips of the finished product (polypropylene);
- dust of additive to the polymer;
- sludge generated during wastewater treatment at the local treatment facilities.

Wastes of the auxiliary facilities' operation and wastes generated in the process of activities by the personnel, such as spent mercury lamps, spent motor oils, spent industrial and other oils; oily rags; wood chippings; oily sand; packing waste; unsorted

domestic waste; sweepings (when cleaning the territory); ferrous and nonferrous metal scrap, etc. will be accounted at the stage of the design documents' preparation.

The projected qualities and characteristics of the main process wastes are given in Annex 19.

Assessment of the generated wastes' toxicity level

At the current stage of the ESIA preparation, due to unavailability of the required initial data, hazard class of wastes not included in the Classifier of Wastes is calculated in accordance with "Criteria for identification of wastes' class of hazard for the natural environment" adopted by MNR RF of 15.06.2001, №511, and identified based on analog projects (according to the information provided by the Client [47]).

At the stage of the design documents' preparation, additional calculations will be made to specify the wastes' hazard class.

Quantification of the generated wastes

At this stage the quantities of the main process wastes are defined by data provided by the Client [47] and will be specified at the stage of the design documents' preparation.

At the stage of the design documents' preparation, quantities of wastes of the auxiliary facilities' operation and domestic wastes will be also specified.

Onsite collection and storage of wastes

Waste management procedure will be established in accordance with the applicable regulatory requirements.

Different types of wastes will be collected and stored in specially arranged places to be identified.

Some wastes will be transferred for disposal at the disposal site of OOO «Tobol'sk-Neftekhim».

The disposal site of OOO «Tobol'sk-Neftekim» may accommodate the following wastes for long-term storage:

- spent solid catalysts, sorbents (3-4 hazard class);
- sludge of pipelines' and tanks' cleanup (3 hazard class);
- oily sand (4 hazard class).

Solid wastes of hazard class I will be stored in sealed returnable containers only (drums, tanks, etc.); hazard class II – in tightly closed packing (polyethylene bags, plastic packs); hazard class III – in paper bags and boxes, cotton bags, textile bags; IV and V – in bulk, in rows.

Waste storage inside the plant's territory will be compliant with the sanitary-epidemiological requirements to production facilities' territories and premises.

Waste collection and transportation will be carried out in accordance with the relevant waste- specific standards and regulations.

Waste management shall be in full compliance with requirements of SanPiN 2.1.7.1322-03 “Hygienic requirements to disposal and neutralization of production and domestic wastes” adopted by Resolution of the Chief State Medical Officer of the Russian Federation dated 30.04.2003 №80.

Personnel responsible for waste management will receive training in accordance with the relevant regulatory requirements.

The procedure for waste management at the plant will be described in detail in the design documentation.

Impact on Soil and Land Resources

During preparation and construction works potential impacts on soil and land resources include:

- allocation of lands for temporary use or withdrawal for permanent use, conducting earthworks and associated works (drainage, water drawdown);
- topsoil cut-off on part of allocated lands with possible partial mix-up with underlying layers during sites leveling, as well as during off-road movement of construction equipment and transport;
- natural topography transformation and generation of positive and negative landforms during excavation and other construction works;
- soil contamination with products of fuel burning and/or its sedimentation on soil surface;
- soil contamination during atmospheric precipitation infiltration through the topsoil at the materials and wastes storage areas.

Above listed impacts will be localized within the area allocated for construction (Annex 17). According to information, submitted by the Client, the land plot allocated for construction is situated within the production site of OOO “Tobol’sk-Neftekhim”. The following land areas are adjacent to the construction site:

- Production units and infrastructure facilities of OOO “Tobol’sk-Neftekhim”,
- , Forested area on the East,
- Cut over areas with young natural vegetation (trees and bushes) on the South and North (Annex 18).

The following negative impacts can be expected at the adjacent areas:

- topsoil dumping from construction site to topography depressions and local river valleys network;
- local soil contamination with construction equipment wastes, domestic wastes, oil products and hazardous liquids;
- vegetation cover reduction and soil compacting in the forested areas, adjacent to the construction site;

- topsoil contamination with gas-phased substances and aerosols, formed during construction works on subject site;
- initiation of negative geomorphologic processes, drainage conditions change.

After the plant is commissioned, mechanical impacts on soil cover will be minimized. Precipitation of polluting substances emitted from point and moving sources will remain a major source of soil contamination (Annex 16).

In accordance with Methodological recommendations on identification of boundaries and areas of sanitary protection zones of industrial sites and areas (Moscow-Perm, 2003), the affected area of atmospheric pollution (including its impact on soil cover) should be bounded by 0.05 MPC isoline. (issue 6.7.2). Calculations of 9 main contaminants distribution, emitted by stationary sources of OOO "Tobol'sk-Polymer" shows that hydrogen sulphide, hydrogen chloride, and chloride have the biggest area of atmospheric dispersion, (300, 1000, and 3000 meters radius correspondingly), see Appendix 7.3 Outlined by chloride 0.05 MPC the three-kilometer impact area almost fits into sanitary protection zone of OOO "Tobol'sk-Neftekhim", but its eastern part laps it over by 1,3-1,4 km in direction of Abalaksky natural reserve (Annex 7). Minimal distance between this reserve and the project impact area is 400 meters.

Approximate scoring of comparative significance of impacts on soil and land recourses allows to divide them into three groups – low (rated 5), medium- (rated 7-9) and high (rated 10-11, see Annex 16). The most hazardous are change in drainage conditions, mechanical destruction of soil cover, soil contamination with oil products and other hazardous liquids, soil contamination by wastewater and drain waters, accumulation of atmospheric contaminants in soil.

Listed below measures allow mitigate or completely eliminate impacts on soil and land sources.

1. Land allocation. Land withdrawal and impossibility to use the site land/ soil for other purposes is an unavoidable project impact. According to the baseline studies [28], soils within the area of OOO "Tobol'sk-Polymer" are of low level of fertility and transformed by industrial activities (total 122 ha, 134 ha with infrastructure). Their location within the sanitary protection zone of the operating chemical facility already limited their potential to be used for agricultural, recreational, nature protection or residential purposes. Placing of the new plant on these lands will not significantly affect soils and land resources of Tobol'sk and Tobol'sk rayon. No temporary land withdrawal beyond OOO "Tobol'sk-Polymer" site is planned within this project.

2. Impacts at the operation stage. The Company will perform topsoil contamination monitoring (responsibility of the internal environmental service (see Section 11)). Taking into consideration low emission rate of the designed plant, the level of soil contamination caused by air emissions is expected to be insignificant.

Data on the impact of the existing production of OOO "Tobol'sk-Neftekhim" on soils within the sanitary protection zone is very limited. It is stated in document [73] that 100 meters to the east of "Tobol'sk-Neftekhim" production site concentrations of Zn in soil is slightly higher, at the distance of 500 m – Zn and Cu, and at the distance of 1000m – Cu, correspondingly. In the same time, these exceedances are not above-level, because MPC exceedances were not registered.

Based on available information on type of industrial activity, we may conclude that the impact of the new facility on soils is expected to be insignificant, without MPC exceedances,. No significant impacts from OOO ”Tobol’sk-Polymer” on soil and land resources (phytotoxicity growth, contaminants discharge into groundwater, etc) are expected. To prove this assumption and to perform soil monitoring on a regular basis, a soil and geochemical monitoring program has been developed (Section 11).

Impact on vegetation and wildlife

Impact on vegetation

Main impacts on vegetation at the stages of construction and operation of the polypropylene production plant will be the following:

1) direct elimination of vegetation during excavation and construction works onsite. This impact will be localized within the land allocation area and as an unavoidable project impact it does not require any environmental protection measures’ implementation.

2) Indirect impacts from air emissions on the vegetation at the site and adjacent areas. Degradation of vegetation in the impact area of the organic synthesis facility can be caused by changes in photosynthesis conditions, atmospheric precipitation of pollutants and pollutants absorption by plants. Atmospheric pollution influence on vegetation depends on contaminants type, level of impact, sensitivity and composition of vegetation community. Regular surveys should be performed to monitor such impacts;

3) Local impacts on vegetation resulting from soil contamination and man-made fires. The project shall provide measures for such impacts’ mitigation and ensuring prompt and effective elimination of their consequences at the stages of construction and operation.

Vegetation of the OOO “Tobol’sk-Polymer” site and adjacent areas is represented with forest and meadow species with abundance of ruderal flora (Annex 17). Impacts by the intended activity of polypropylene production will be both direct and indirect .Direct impact will be short-time and connected with the construction stage, resulting in direct elimination of vegetation within site’s boundaries. Birch and asp forest, shrubbery, moist meadows and sedge-grass willow shrubs will be affected. All mentioned vegetation types are secondary and have not much value as a resource or significance for conversation of region’s biodiversity. There are no records on protected vascular plants or cenosisys within construction site area.

Indirect impact on vegetation will be caused by air emissions at the stages of the new plant’s construction and operation. Air emission sources at the construction stage will be construction equipment, at the operation stage – organic synthesis units, boiler houses and flare systems.

Currently vegetation of OOO “Tobol’sk-Polymer” project area is already impacted from existing OOO “Tobol’sk-Neftekhim”. According to the available data [73], predominant tree species – drooping birch and trembling poplar (asp) – demonstrate clear changes of morphological and physiological parameters, comparing to the background areasoutside the impact area of OOO “Tobol’sk-Neftekhim”. Major plants transformation was noted at

the distance of 500 m east to facility's boundary (exact locations of key survey areas are not mentioned). Asp showed lower stability to man-made impacts, comparing to birch. At the distances of 1000 meters from eastern site boundary the changes in both species were clearly seen, which gives evidence of significant impact of the existing production facility emissions on vegetation within its affected area. Given that the key survey areas are located at a rather long distance from the sources of impact, there is a possibility that the facility also cause impacts on vegetation of Abalkansy reserve. Under such conditions an additional impact of newly established OOO "Tobol'sk-Polymer" will be insignificant and will affect some plants or parcels in nearest vicinity of the emission sources within the OOO "Tobol'sk-Neftekhim" sanitary protection zone. No significant changes in the ecosystem (species composition reduction, changes in phytocenosis boundaries, etc.) due to air emissions are expected.

Local impact on vegetation of the site area and adjacent territories can be also associated with local soil contamination with oil products and other hazardous liquids, construction and production wastes, wastewater and storm water.

During cleaning and leveling of construction areas, a man-triggered fire and fire-induced transformation of vegetation may happen. Such hazard will also remain after commissioning the plant: brushwood, wood litter, vegetative mass on drained land, temporary waste storage areas can be ignition sources.

To reduce adverse impact of the project construction and operation on vegetation of the site area it is necessary to minimize disturbance and elimination of vegetation communities beyond the land plot boundaries, to use existing roads and sites, to minimize the construction equipment movement outside of access ways, to follow fire-safety rules, etc.

To restore the vegetation cover onsite the following operations will be performed:

- timely removal of construction debris, brushwood and stubs from the construction site territory;
- timely execution of drainage works to prevent negative changes of hydrological regime;
- leveling the disturbed areas with bulldozers, and topsoil returning from temporary dumps and spreading it over disturbed areas.

Impact on wildlife

New production complex will be situated within the territory of the existing plant, so polypropylene production will not seriously impact the wildlife.

Impact on fish fauna in nearest to the site area surface water bodies will not increase, as storm water and wastewater will be treated on OOO "Tobol'sk-Neftekhim" treatment plant, which has the required reserve capacity.

Assessment of potential impact of the project on the socioeconomic environment, infrastructure of the rayon, land management and historical and cultural heritage

URS's comments and proposals were taken into account, to the extent possible, based on data availability.

Economic Impacts

The Project implementation will contribute to a considerable increase in payments to the budget of Tyumenskaya Oblast: the budget payments in 2010-2025 will be RUR 10 billion. Moreover, the new production facility will contribute to incremental payments to the federal budget of different levels in an amount of RUR 80 million due to the social fund contributions and income tax.

It is expected that the next few years will see a considerable increase in the polypropylene demand for car-building and electronics industries, and consumer goods manufacturing. This will contribute to the Small and Medium Enterprise (SME) expansion, connected with production and sales of polypropylene goods, and service sector development driven by the production facilities of OOO «Tobol'sk-Polymer». SME development will contribute to the attraction of more investments to Tyumenskaya Oblast, increase of employment level and increased income of the local population.

These processes will have a positive impact on economy of Tobol'sky Rayon as well as on economy of Tyumenskaya Oblast. New jobs will have a direct impact on the standard of living of persons involved in the project implementation and members of their families. Improved life standards of this group will entail the increase in the spending among the population of the Rayon, and correspondingly, of the goods turnover. The positive impact on the general economic situation in the Rayon might be viewed as a long-term impact of the Project.

Social Impacts

Employment Level

General demand in labor force during the construction period in peak periods may amount to 4000 people. At the operation stage the new enterprise will require 500 blue collars and 95 white collars. The main market to meet this demand is Tobol'sk and Tyumenskaya Oblast .

They suppose that each job at the new enterprise may lead to the creation of at least two jobs in other enterprises, which are directly or indirectly related to the new.

Therefore, creating new jobs will lead to the reduction of unemployment in the region (before recession the unemployment rate for Tobol'sky Rayon was 5% and for the city of Tobol'sk - 1%).

Public Health

Both at the construction and operation stage of the Project implementation, an adverse impact on the public health may be mainly caused by the enterprise emissions. There could also be injuries and occupational diseases at the enterprise itself, and this may lead to some increase in the loads on the medical facilities in Tobol'sk. The Company assumed all necessary measures to reduce chemical and acoustic impacts of new enterprise to safety levels. While construction and operation periods the Project will comply with the OHS standards and environmental requirements to mitigate all possible risks of impacts on public health. Additionally, some activities are planned to compensate the increased load on the medical facilities in Tobol'sk (see section 10).

Education

All the projected employees will be trained at the related educational and training institutions of Tiumen and Tobol'sk cities (Tobol'sky Industrial Institute, Tomsk Technical University, and Tiumen State University). Both basic education and advanced training are to be organized according to agreed programs on apprenticeship agreements and agreements with educational and training institutions. The main operations personnel will be trained at the Dehydration Facility OOO Tobol'sk-Neftekhim.

It is expected that the need in the qualified personnel will lead to the increased number of students in these higher educational institutes and potentially improve the general educational level of the population in the Rayon.

Demography

The main potential impacts of the Project on the demography in the Rayon may include the growth of the population in the Rayon due to the inflow of the Project employees recruited from the nearby rural areas and positive population growth.

A potential negative impact of the project may be a considerable growth in the illegal migration (i.e. excessive – higher than the real demand in human resources – inflow of employable population searching for jobs in the Project area and this may provoke conflicts (including between the local population and migrants) and increase of the social tension. The Project provides for development of specific measures to mitigate this risk.

<u>Impact on the Rayon Social Infrastructure</u>

Housing and Social Amenities

The Company assumed all possible measures to provide comfortable housing to all Project employees. At the Project implementation stage, the constructors will live in the constructors' camp at the industrial site (10 km away from Tobol'sk) and furnished with the required social amenities.

Some detailed information on constructors' camp composition is given below:

- Dormitory for 342 sleeping places - 10;
- Dormitory for 291 sleeping places - 2;
- Bath-house, laundry-room - 2;

- Canteen - 2.

Representatives of the engineering companies involved in the Project implementation will be staying in the apartment blocks of a new residential project (see below).

In order to address the housing issues at both the Project implementation and operational stages, OAO SIBUR Holding entered into an agreement on cooperation in the area of housing (dated 15 February 2007, registration No.14 dated 22 February 2007) with Administration of Tyumenskaya Oblast concerning the construction of the residential project for the operational personnel of OOO «Tobol'sk-Polymer». The proposed residential development will be 45,000 m2 of floor space (685 apartments). The first apartment building will be finished in 2008. The employees will have an opportunity of apartment purchase within the program of mortgage credit on privileged terms.

For foreign specialists, temporary accommodation will be organized in the Slavianskaya Hotel.

Transport

The Project implementation will probably increase intensity of goods' traffic on the road and rail network between Project site and Tobo'lsk River Port (at the Project implementation stage) and railway stations Tobol'sk and Denisovka (at the operational stage of the project). Employees will be transported to the site by the Company buses. Increased transportation load at the transportation lines leading to the enterprise may bring to increased risk of emergencies occurred on the road and rail network. Local temporary overload is also possible within the places of forced transport concentration (roadway narrowing, check points, railway-crossing, zones of road under repair, etc.).

To maintain the transportation lines leading to the enterprise, the Project will rehabilitate them including the strengthening of the bridges.

Public Health Facilities

The concentration of labor force at the Project implementation stage (4000 people) and at the operational stage (about 600 people) will bring to increase in load of the medical facilities in Tobol'sk and Tobol'sky Rayon. To reduce this load the Company will provide strict supervision over employees' compliance of all health and safety requirements to mitigate all possible risks of injuries and occupational diseases, and also will not employ people with any medical contra-indications. The volume of medical treatment provided to employees will comply with requirements of the state compulsory health insurance programs. Additional medical support and assurance will be provided to personnel who operate hazardous facilities and on workplaces with harmful labor conditions.

The employees of the Company and its contractors' employees will receive medical support not only in medical facilities in Tobol'sk and Tobol'sky Rayon, but also at an onsite medical station of OOO Tobol'sk-Polymer and mobile aid-posts of the general contractors.

Social Responsibility

The SIBUR Group believes that social responsibility is the cornerstone of building a successful and sustainable business.

Social respondibility of SIBUR as an employer is based on providing safe and healthy working and living conditions. The Company creates jobs, pays competitive salaries and provides social protection.

All employees of operating facilities of the SIBUR Group get the following social benefits and protection:

- food on the industrial sites;
- medical assurance and support;
- health improvement and recreation for employees and their relatives;
- recreation programs for employees' children;
- sports events and cultural programs.

The SIBUR Group intends not only to provide its employees with the good quality of life, but also to contribute to socioeconomic development of the regions where the businesses operate.

OOO "Tobol'sk-Neftekhim" has several social facilities on its balance:

- onsite medical station;
- canteens and meal stations;
- health-improving complex "Radugniy";
- sport complex «Molodost'»;
- recreational centre «Sintez».

Also the SIBUR Group implements programs of social investments and charity. The target audience of these charity programs is mainly children, youth and "golden-agers".

For example, SIBUR Group successfully implements the program "I am Siburenok". The project is designed for all employees' children (more than 40000 children).

This program includes the following:

- organization and carrying out of children contests;
- carring out of socially important actions;
- organization of children activities, devoted to holidays;
- organization of actions for winners of children contests "Moscow for children", "Trip to St. Petersburg" (it is planned to broaden the geography of these social initiatives).

SIBUR Group intends to implement socially responsible policy in relation to OOO Tobol'sk-Polymer employees, and also overall support in organization and carrying out of socially significant activities in Tobol'sk and Tobol'sky Rayon.

However, the exact list of employment benefits for OOO Tobol'sk-Polymer employees is to be defined. The plan of investments in social and educational programs of Tobol'sk and Tobol'sky Rayon also requires to be worked out.

Land Use

There will be no changes in the land use pattern of the Rayon, since the new Project site and its sanitary protection zone will be located within the industrial zone and the existing sanitary protection zone of OOO Tobol'sk-Neftekhim.

Historical and Cultural Heritage

The Project construction and operation will produce no impact on the cultural and historical sites, since there are none at the Project site and the potentially impacted area, in accordance with the conclusion by the Committee for the Protection and Use of Historical and Cultural Heritage.

6.3 Impact at Project's Decommissioning Stage

Just a very rough assessment of impacts associated with the project's decommissioning stage is possible now, as the issue of the project liquidation has not been addressed.

If a decision on the facility's decommissioning is taken, the Company will prepare design documentation under a separate project. which will include the section on Environmental Impacts' Assessment.

The main sources of air emissions will probably be: road machinery, transport, welding equipment, jackhammers and other equipment used for dismantling of buildings and facilities.

Pollutants from the point sources will be common and industry-specific.

Major waste sources of decommissioning stage would be fragments of demolished buildings and facilities and soil around them.

To mitigate possible impacts during the decommissioning stage, special disposal places for temporary waste storage will be arranged in compliance with the environmental safety norms and standards.

7.0 ASSSESSMENT OF PROJECT IMPACT IN EMERGENCY SITUATIONS

This section presents analysis of potential emergency situations.

Considered potential risks include contours of a fire cloud of fuel-air mixture, jet fire, and overpressure wave.

The most potentially hazardous substance on-site is liquid propylene, which may be fire-hazardous when exposed to air. The hazard associated with a propylene cloud formation and subsequent possible exposure results from high pressure in the system that may bring to its leakage from equipment and pipelines.

Materials' leakage may occur as a result of equipment integrity loss or pipeline damage.

The leakage volume primarily depends on the damage size, the current phase of the material and the working pressure.

In a case of a tank shell catastrophic failure, the tankage will be discharged very rapidly.

In a case of a transfer pipeline damage the discharge value is assumed to be 120% of the normal flow.

Discharge time depends on equipment for its detection and further confinement.

In many cases the discharge time is too short for its detection and confinement.

Over 300-second discharges are to be confined if detected both by the process control equipment (on the basis that the discharge rate exceeds the normal flow rate by more than 5%) and by gas detectors (the plant is supposed to be equipped with an integrated gas detection system capable of discharge detecting when the rate is over 5 kg/sec).

In a case of an instantaneous ignition during a catastrophic breakdown of a tight tank, three kinds of potential hazards occur:

- thermal exposure of the discharged materials' intensive burning that often is spherical shape and forms a fireball;
- blast-wave overpressure as a result of pressure release at the moment of shell damage (normally small);
- burst at the moment of the damaged area cracking that brings to the tank damage.

Assumingly, polypropylene leakages create initial overpressure of 1 bar. The probability to initiate a ball cloud exposure is very low.

Potential risks' mitigation measure:

- safe distancing of process units;
- equipping production facilities with gas detection system with remote data transfer;
- equipping tanks with explosion valves;
- installation of trays for containment of possible leakage of combustible fluids.

8.0 ENVIRONMENTAL MONITORING

Environmental monitoring on the territory of industrial facilities and within the impacted area is performed for the purpose of:

- assessment of the environmental components' condition;
- tracking quantifiable and qualitative changes of the environmental conditions.

The itemized regulatory documents' requirements apply to environmental monitoring performance:

- Federal Law "On Environmental Protection", 10.01.2002, №7-FZ;
- Federal Law "On Protection of Atmospheric Air , 04.05.1999, №96-FZ;
- Provisions on environmental impact assessment of intended activity in the Russian Federation, adopted by Order of Goskomekologia of Russia dated 16.05.2000, №372;
- The RF Water Code of 16.10.1995, №167-FZ, Article 78;
- Constructions standards and regulations (SNiP 11-02-96, SP 11-102-97, SP 11-103-97), and requirements of the sanitary legislation of the Russian Federation.

Environmental monitoring covers:

- systematic registration and monitoring of quantitative and qualitative indicators of environmental conditions within adverse impact sources' location and areas of their potential impact;
- supervision over implementation and effectiveness of proposed recommendations for environmental components' conservation and restoration.

Environmental monitoring performance will provide for:

- carrying out systematic environmental assessments of the monitored areas during the project implementation;
- ensuring compliance with the norms and requirements of the current environmental legislation;
- preparing prompt recommendations for improvement of environmental performance to be in line with the permissible environmental impact level;
- estimating technogenic load on the main environmental components during the industrial site operation;
- creating an environmental baseline database for the monitored territory.

Environmental monitoring (hereinafter called Monitoring) is supposed to be conducted at monitoring stations and monitoring points of the existing stationary observation network (Annex 10).

The observations will cover:

- atmospheric air quality and noise load;

- soil chemical contamination level;
- vegetation quality;
- surface water and groundwater pollution level;
- composition and volume of consumed water and transferred wastewater ;
- compliance with requirements for temporary waste storage areas.

The observations include systematic measurements of quantitative and qualitative environmental indicators in accordance with a certain program.

In this case, it is not feasible to organize wildlife monitoring as significant impacts on this environmental component are not expected.

8.1 Atmospheric Air Quality and Noise Load Monitoring

The purpose of the atmospheric air quality monitoring is to identify its pollution level.

The atmospheric air quality monitoring stations (as per the terminology of GOST 17.2.3.01-86 – stationary posts) are supposed to be located near air emission sources (monitoring points MP 1 and MP 2 in Annex 10), at the border of sanitary protection zone (MP 3, MP 5, MP 6), near dwelling area (MP 4) and SPNA (MP 7) with regard for prevalent wind directions.

Air sampling shall be performed in accordance with the following standards and regulations: GOST 17.2.6.01-86, GOST 17.2.3.01-77, GOST P 50760-95, SanPiN.2.2.1/ 2.1.1.1200-03, RD 52.04.186-89.

Air samples are to be taken twice a year: during the warm and the cold seasons.

Monitored substances for identification of the atmospheric air pollution level are:

- carbon oxide;
- nitrogen dioxide;
- sulfur dioxide;
- hydrogen disulfide;
- chlorine;
- chlorine hydride;
- hydrocarbons;
- suspended solids.

In parallel, the above substances' concentrations in the air will be monitored directly at pollution sources (i.e. "at the end of stack"). These monitoring observations will be scheduled during preparation of the MPE volume and the related environmental documents.

Instrumental monitoring of noise load shall be organized in accordance with requirements of GOST 23337-78 (amended as of 31.12.81) at monitoring points MP-1, MP-2, MP-4, MP-5 and MP-7. The first series of observations aimed to registering the current background noise level shall be carried out before starting construction work on the site.

The monitoring frequency shall be defined in accordance with the schedule of elevated noise operations (pile sinking etc.) Upon completion of the construction period, the background noise levels are registered repeatedly. Monitoring within the operation period should be scheduled taking into account the operation modes of flare systems and other sources of operational noise. In conditions close to the permanent level of occupational noises, their instrumental monitoring may be carried out in parallel with monitoring of air and other environmental components' quality. Data on noise load in the day and the night time shall be available, as well as the weather conditions, which influence the background noise level (wind etc.) to be taken into account.

8.2 Surface water and groundwater monitoring

At the project site of OOO «Tobol'sk-Polymer» shallow groundwater occurs close to surface (at the depth of 0.5 – 4m). Groundwater rise occurs at some parts of the site, there are many isolated depressions filled with water. In such conditions it is possible to monitor the upper aquifer by periodic sampling of the liquid phase of the aquifer in specially installed observation wells (preferably) or in trial pits. Due to unavailability of data on monitoring network of OOO "Tobol'sk-Neftekhim", OOO "Tobol'sk-Polymer" is supposed to install groundwater monitoring wells in points - MP 1 and MP 7. As the water chemistry and pollution level of the upper aquifer will depend not only on OOO "Tobol'sk-Polymer" contribution but on neighboring pollution sources' operation as well, it would be most appropriate to combine efforts of the two companies in hydro-geo-monitoring and using the existing network of monitoring wells and the related monitoring data.

Sampling should be carried out in parallel with monitoring of water level, its physical and organoleptic properties (transparency/turbidity, color, odor, temperature, pH, redox). In accordance with SP 2.1.5.1059-01, a list of substances to be checked by laboratory chemical analysis shall include oil products, benzene, formaldehyde, ethyl benzene, monoethanol amine, cadmium, lead, chloroform, nickel, mercury, chrome, surfactants, cobalt, arsenic, manganese, bromine, boron, ammonia, zinc, copper.

Suggested frequency of groundwater sampling for fail-safe operation of the site is three times a year: summer low-water period, winter low-water period, spring flood.

Surface water bodies within the site and the project impact areas are man-made (watered pits of man-induced topography). It is proposed to carry out periodic visual and instrumental observations of those located within the site and by its perimeter. During observations it is necessary to identify signs of water pollution with oil products (oil sheens, coagulates on the water surface, etc.), indirect signs of water pollution (mass mortality of hydrobionts, suppressed water vegetation, high turbidity, discoloration, odor, etc.), physical-chemical properties of water (pH, temperature, redox). A list and locations of water bodies to be monitored as part of environmental monitoring program of OOO "Tobol'sk-Polymer", are to be determined upon completion of all excavation and construction works on the site; monitoring frequency for fail-safe operation – not less than three times a year, plus immediate control in the areas of accidental pollution.

8.3 Soil quality monitoring

In pursuance of Rostechnadzor Provisions on environmental monitoring, the process of monitoring in the sphere of soil and land resources' protection shall include observation of soil cover condition in the impacted area, including assessment of the physical-mechanical disturbances of soil and the level of soil contamination with air pollutants' emitted from onsite sources.

Soil quality monitoring at the stage of construction shall include: 1) regular (on weekly or monthly basis - as scheduled) visual inspection of the construction site with identification of all physical-mechanical disturbances of the soil cover (see the below classifier), preparation of the relevant protocols and follow up of the identified disturbances' removal by the time of next visual inspections; 2) topsoil (0-5 cm) sampling of the territories adjacent to the site if concurrent air sampling reveals persistent above-level air pollution with components of air emissions by stationary and non-stationary sources of the construction site.

In the process of environmental monitoring of a construction site, attention should be focused on the kinds of disturbance, presented in table below (Table 8.3-1).

Table 8.3-1. Kinds of disturbance according to works.

Works	Disturbance location	Kind of disturbance
Preparation works		
Hardy-shrub plants' removal from the allotment (in our case vegetation is found mainly at the site's periphery and its removal is not recommended)	Land allotment	Littering of the land plot and the adjacent territories with felling residues
Construction of temporary roads or access ways	Land allotment and the adjacent territories	A water channel or a collector drain's filling with soil without pipe culverts' construction or laying these without capping, mismatch of pipe culverts' diameter, height and the filling width to the given sizes
Earth works		
Trenching for communication lines	Land allotment	Excavated earth dumping into collector drains or on soil surface before removal and stockpiling of the fertile soil layer. Damage of above-ground utilities (cable lines, collector drains). Improper performance of actions for surface water and groundwater disposal from trenched areas and construction/installation sites.
Land reclamation (if provided by the project for temporarily withdrawn lands)		
Removal and stockpiling	Land allotment	Fertile layer damage, destruction, and mixing

Works	Disturbance location	Kind of disturbance
of the fertile soil layer	and the adjacent territories	with ground. Loss of the fertile soil layer during its removal and stockpiling or deterioration of its quality. Use of the fertile soil layer for filling, damming and making other temporary earth structures for construction purposes.
Corrosion prevention	Adjacent territories	Improper execution of landslide control, erosion control and gully control measures, (if provided by the project).
Waste cleanup	Land allotment and the adjacent territories	Improper cleanup of construction wastes; garbage and other pollution removal.
Leveling and restoration of soil cover on the territory	Land allotment and the adjacent territories	Improper land leveling and fertile soil laying within the allotment (if provided by the project)
Maintenance (restoration) of the local discharge system	Land allotment and the adjacent territories	Improper maintenance (restoration) of the local drainage system, sediment control of water channels, ditches of temporary discharge, collectors.
All works		
All works	Adjacent territories	Damage or destruction of top soil, hardy-shrub plants in forest areas. Covering root crowns and sticks of growing trees and bushes with soil (unspecified in the project documentation).
- « -	Land allotment	Spontaneous groundwater flow out during drilling operations.
- « -	Land allotment and the adjacent territories	Concurrent use of natural resources without having the design documentation approved by the relevant state supervisory authorities and the local administration.
- « -	Land allotment and the adjacent territories	Destruction, damage or littering of manmade or natural water courses.
- « -	Land allotment and the adjacent territories	Placement of construction-installation sites, constructors' camps, auxiliary structures, waste (garbage) disposal areas, parking lots, fuelling stations, mechanical repair shops beyond the land allotment boundaries.
- « -	Land allotment	Improper execution of measures for prevention

Works	Disturbance location	Kind of disturbance
	and the adjacent territories	of polluted effluents entry into water bodies
- « -	Adjacent territories	Land disturbance as a result of unauthorized road construction

Soil quality monitoring at the stage of operation. In this period physical-mechanical impacts on soil will be nearly a minimum, while chemical pollution (indirect - via air) will tend upward. In accordance with the available data about the project, the list of air pollutants will include chlorine hydride, hydrogen disulfide and chlorine, which relevant (up to 0,05 MPC) dispersion zones are the biggest (up to 3 km from the sources, see Section 5 and Annex 7). Alongside with these components the plant's sources will emit a wide range of other compounds including suspended solids and polyaromatic hydrocarbons, which dispersion was not calculated due the absence of initial data about the sources.

All these substances have been released to the soil surface of the subject under review over a long period time. The new plant's commissioning will increase these substances' load on the soil cover, and therefore, this should be subject to observations within the environmental monitoring program. With regard for impact on soil, it would be appropriate to monitor dust load on the surface, and in a case of its significant increase, to identify contents of heavy metals and PAH in the emitted suspended solids. Concentrations identified during surveys of the year 2008 should be deemed as background concentrations of chemical elements and compounds in the soil. [28].

When developing the environmental monitoring program (in part of soil quality monitoring) it is necessary to take into consideration a probability of increasing impact by other polluters of the atmosphere and the soil cover – the motor road, the railroad, the OOO "Tobol'sk-Neftekhim" facilities. The program shall include the following key elements.

1. Acquisition and analysis of data on potential pollution sources located within the area of the intended monitoring, including information about composition and frequency of controlled and accidental emissions and discharges, composition of pollutants, areas of laying underground service utilities and the carried media, etc. All the relevant information is integrated in a layout of potential sources of pollution of the territory.

2. Analysis of the landscape-geochemical structure of the territory of the intended monitoring to identify zones of major discharge, transit migration and accumulation of pollutants determined by changing conditions of their migration and transformation in the topsoil, ground and groundwater. This data is integrated in a landscape-geochemical map, which scale corresponds to the scale of the intended stationary observations.

3. Preparation of a monitoring diagram by integrating the landscape-geochemical and map layout of potential sources of pollution of the territory; spatial arrangement of monitoring points (monitored areas and sampling points) taking into account configuration and correlation of the identified eluvial, trans-eluvial and accumulative positions and location of technological facilities.

Generally, monitoring points shall be located: 1) close to potential pollution sources; 2) in the zone of occurrence of soils with background characteristics (i.e. nominally unpolluted);

3) in the zone of concentrated accumulation of pollutants' (geochemical barriers) suspected or confirmed at the stage of preliminary studies; 4) in the rest of the monitored territory – with regard for its landscape-geochemical structure or, that is often less effective, by a grid. As per Article 6.13 of SanPiN 2.1.7.1287-03, the number of monitoring points depends on the area of the construction site, depth of the foundation, or depth of service utilities' laying, stages of design and construction works.

Development of recommendations on location of sampling points and monitoring areas is possible after identification of pollutants' migration canals in the earth cover, the areas of their major discharge and accumulation. The universal biochemical and sorption concentrator- barriers are organic horizons (peat inter-beds, mor clusters, etc) and humus horizons. Some water migrants of technogenic flow are sensitive to recovery barriers occurring at the contact with gley horizons, horizons with sulphureous media, and to alkali-type barriers of carbonated horizons. Screen barriers may be water barriers (for oil products), heavy-textured horizons.

As per Article 6.6 of SanPiN 2.1.7.1287-03, upon a project commissioning, the client shall provide for a laboratory analysis of soil quality at high risk facilities (to be listed in the sanitary-epidemiological conclusion). Particularly, as per Article 6.7 of the above, soil quality is monitored in residential areas, zones impacted by motor transport, production waste burials, temporary storages of production and domestic wastes, agricultural lands, sanitary protection zones. In our case, the subjects of monitoring shall be soils near SPNA boundaries (Abalaksky reserve) and the settlement closest to the site.

The proposed layout of points for soil quality monitoring in the impacted zone is given in Annex 10; in addition to three calculation points 4, 5 and 6 at the border of the SPZ established for OOO "Tobol'sk-Neftekhim", soil samples are to be collected near sources of OOO "Tobol'sk-Polymer" (monitoring points MP 1 and MP 2) and near crossings of the OOO "Tobol'sk-Neftekhim" SPZ contours and the impact zone of OOO "Tobol'sk-Polymer" (MP 3 and MP 6), at the distance of 500 m from the border of Abalaksky reserve (MP 7). Soil samples within the site of OOO "Tobol'sk-Polymer" shall be taken in temporary waste storage areas.

4. Defining a list of monitored parameters and the relevant methods for the three categories of monitoring:

- monitoring observations at 5 abovementioned points;

- fieldwork (in areas of accidental pollution);

- special work (related to increase of a certain man-induced impact's significance or when the monitoring reveals above-norm soil contamination).

The scope of studies and the list of indicators to be looked into when monitoring are case-specific and defined with regard for the relevant objectives and tasks upon approval by the authorities and institutions that perform the state sanitary-epidemiological supervision. The standard list of monitored parameters includes pH, 7 chemical elements (heavy metals and arsenic), benz[a]pyrene, measuring of chlorides' and sulphates' concentrations may be recommended additionally.

Soil sampling is regulated by the state standards' general requirements to collection of samples, methods of sampling, and preparation of samples for bacteriological and helminthological analyses, and by methodical guidelines for hygienic assessment of soil quality in residential areas. [SanPiN 2.1.7.1287-03, Articles 6.7, 6.9]. All studies for soil quality assessment shall be carried out by laboratories accredited in the established manner. Chemical pollutants' concentrations in soils are measured by methods applied for setting up MPC (TPC) values or by other metrological attested methods included in the state registry of methods [The above, Articles 6.10 and 6.11].

5. Monitoring time schedule (frequency and duration) is determined with regard for specific technological cycles and seasonal rhythms of natural phenomena. In our case, when the soil impact is expected to be mainly indirect (via precipitations), we recommend to carry out soil sampling straight before the project commissioning, and further – during the warm season of the next calendar year. In case of the monitored parameters' correspondence with the background values, the sampling frequency may be reduced to 3 years, provided that the plant is operated fail-safe.

8.4 Vegetation Monitoring

The purpose of vegetation monitoring is to identify reaction of certain plants and their vegetation communities to disturbance and pollution as a result of construction and operation of OOO «Tobol'sk-Polymer» polypropylene production complex, because vegetation cover is a universal environmental indicator.

Depending of the extent and forms of technogenic impact on vegetation cover, the below may be exposed:

- species s' composition;
- life-form spectrum;
- viability of certain species s ;
- productivity of terrestrial phyto-mass;
- size of species s and their parts, their growth intensity;
- chemical composition of various plants' groups (shrubs, low shrubs, moss, lichen).

In the process of construction and operation of OOO «Tobol'sk-Polymer» polypropylene plant it is appropriate to carry out vegetation monitoring within the previously selected multi-purpose (soil, groundwater, vegetation) monitoring areas near the site and at the background area beyond the intended activity impact zone (all the seven monitoring points shown in Annex 10).

Each area is a10x10 m square for meadow and helobious associations, and 20x20 m – for forest communities. The areas are subject to description of species s' composition, definition of their productivity, balance of vegetation clusters, number of species s and density of phytocoenosis, morphometric analysis, and certain plants' and vegetation communities' sampling for chemical analysis, as scheduled.

Samples are taken to be analyzed for heavy metals and aromatic hydrocarbons' concentrations. Subjects of the analysis are going to be the most common plants, which are indicators of the natural environment pollution with hydrocarbons.

Information on phyto-monitoring taken place at "Tobol'sk-Neftekhim" facilities and the findings is unavailable. In this regard, contribution by OOO "Tobol'sk-Polymer" into the total background impact on the vegetation will be insignificant and difficult to identify. In such case it can be recommended to carry out the above observations over the vegetation cover before the plant's commissioning and repeatedly in one calendar year. Further on, it will be appropriate to agree upon the monitoring schedule with OOO "Tobol'sk-Neftekhim". The absence of data on above-norm pollution of the atmospheric air, natural waters and soil at monitoring points MP 1-MP 7 makes the sampling and chemical analysis of the vegetation unfeasible. In this case the vegetation monitoring may be limited to identification of signs of stressed condition of indicator species s sensitive to air pollution. Persistent presence of these signs must become the reason for carrying out more detailed studies, including assessment of productivity of the vegetation community, sampling and chemical analysis of above-ground and, if necessary, underground parts of the plants.

8.5 Quality and Quantity Monitoring of Consumed Water and Discharged Wastewater

Water of technical and drinking quality will be delivered to the polypropylene production facilities via the water supply system of OOO «Tobol'sk-Neftekhim». The volume of water to be delivered to the projected plant will be continuously monitored.

As the new plant's wastewater is to be treated at the wastewater treatment facilities of OOO «Tobol'sk-Neftekhim», thus, the wastewater disposal agreement between OOO «Tobol'sk-Polymer» and OOO «Tobol'sk-Neftekhim» will define qualitative and quantitative characteristics of the wastewater received from the new plant.

Therefore, the qualitative and quantitative parameters of the wastewater will be monitored. The wastewater volume delivered to the wastewater treatment facilities of OOO «Tobol'sk-Neftekhim» shall not exceed the volume agreed for discharge from OOO «Tobol'sk-Polymer»:

- chemical wastewater 50 m3/hr;
- process wastewater 150 m3/hr;
- sanitary wastewater 50 m3/hr.

Table 8.5-1 shows quality of the wastewater to be received from OOO «Tobol'sk-Polymer».

Table 8.5-1 Quality of the wastewater to be received from OOO «Tobol'sk-Polymer».

Parameter	Value
BOD	300 mg/l
TPH	5 mg/l

Suspended solids	500 mg/l
Dry residue	500 mg/l
COD	450 mg/l
Synthetic Surfactants	4 mg/l
Nitrite -ion	40 mg/l
Nitrogen ammonia	60 mg/l
Phosphates	13 mg/l
Sulfates	100 mg/l
pH	6,5 – 8,5
Wastewater temperature	not more 40C°
Chlorides	300 mg/l
Iron	10 mg/l
Phenols	1 mg/l

8.6 Temporary Waste Storages' Monitoring

The temporary solid waste storage areas are monitored continually, and on a weekly basis, in order to prevent waste impact on the natural environment.

9.0 STAKEHOLDERS' ENGAGEMENT

A key principle of OAO «SIBUR Holding» conduct of business and operations is its commitment to maintain information exchange and transparent relations with stakeholders. These principles are determined by the Environmental Policy of OAO "SIBUR Holding" and the Company's acknowledgement of significant impact, which the Project for construction of polymer production plant OOO «Tobol'sk-Polimer» produces on the economy of Tobol'sky Rayon and its population.

Public consultations provide an opportunity to all stakeholders to express their remarks, comments and concerns on a number of project-related issues. The main objective of public consultations is to facilitate the process of making decisions about the project in consideration with opinions of various stakeholders (general public, technical specialists, the state authorities and design institutions). Moreover, these allow identifying both environmental, social rights of the major stakeholders and their obligations related to the project implementation.

The consultations are an interactive process starting at the project development stage.

OAO «SIBUR Holding» meets requirements of the RF legislation to public consultations' performance, and the international guidelines for holding public consultations and disclosure of information in pursuance of the Equator principles and the IFC standards.

OAO «SIBUR Holding» is ready to provide information on its performance to all the stakeholders, however, taking into account the factors of feasibility and cost.

The national legislation requirements to public participation in environmentally important decision making

The Russian regulatory requirements on taking the public (community) opinion into account when siting, designing, constructing and upgrading of capital facilities are set by Federal Law of 10.01.2002 № 7-FZ "On Environmental Protection", which states that :

- commercial or another activity that produces an environmental impact shall be performed following the principle of public participation in decision making related to their right for healthy environment (Article 3),
- public opinion shall be taken into consideration when siting facilities, which commercial and other activity may adversely impact the environment (Article 13).

The process of environmental impact assessment covers public discussions of the intended activity.

Public discussions is a set of measures taken as part of environmental impact assessment to ensure the public awareness about the intended activity for identifying the public preferences and taking them into account during the impact assessment, for prevention or mitigation of environmental impacts of the intended activity and the associated social, economic and other consequences.

In accordance with the Russian legislation, public discussions are organized by the local authorities and supported by the project initiator:

- The project initiator informs the public and provides access to the information, answers questions and covers all the related expenditures and holds overall responsibility;
- The local authorities assist in arrangement and holding of meetings with the public (public hearings, referendums, work of conciliation committees etc.).

In accordance with Provisions on ESIA[1], the process of environmental impact assessment and public discussions' preparation includes three stages:

1. Notification, preliminary assessment and preparation of terms of reference for environmental impact assessment

2. Conducting studies for environmental impact assessment and preparation of a draft version of the environmental impact assessment .

3. Preparation of a final version of the environmental impact assessment.

However, currently public discussions are obligatory only for ESIA of projects [2] that subject to the environmental review (those located in the internal sea, the continental shelf and the exclusive economic zone). Therefore, it is not binding to conduct public discussions in relation to this project.

Another form of public participation in decision making related to their right for healthy environment are public hearings. Public hearings' performance is regulated by the RF Urban Code and regulations of the local authorities (in this case, Provisions on procedure for appointment, arrangement of public hearings on urban activities in the city of Tobol'sk [3]). Public hearings deal with issues of urban activities and territorial planning. However, in relation to the project under review (especially at pre-design stage) public hearings' holding is not obligatory.

Thus, performance of public hearings on this project is a commitment of OAO «Sibur-Holding», and is to some extent is determined by the international standards and requirements.

International conventions and guidelines for public consultations and disclosure

International conventions

Two international conventions apply to public hearings' performance: the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters — Aarhus convention (1998) and ECE UN «Convention on

[1] Provisions on Environmental Impact Assessment of Intended Activity in the Russian Federation adopted by Order of Goskomekologii RF on 16.05.2000 № 372 (hereinafter called – Provisions on EIA)

[2] The Federal Law of 23.11.1995 №174-FZ «On Environmental Review » (Article 14) binds to conduct public discussions on projects that are subject to the state environmental review as per Articles 11 and 12 therein, namely: projects located in the internal sea, the continental shelf and the exclusive economic zone.

[3] Appendix to Resolution №234 of the Tobol'sk City Duma dated 25.12.2007

Environmental Impact Assessment in a Transboundary Context (ESPOO Convention) (1991)[1].

Both conventions bind the state authorities to undertake actions related to providing consultations and information to the public. Though the Russian Federation has not ratified either of these conventions so far, OAO «Sibur-Holding» shares the principles set forth therein, and endeavors to follow the above.

Aarhus convention

The objective of this convention is to guarantee the public right for information and to facilitate public participation in decision making, and to provide access to justice in environmental matters.

The convention establishes two main principles related to disclosure of environmental information:

- The state authorities shall disclose environmental information on request and on a non-discriminatory basis;
- Environmental information shall be disclosed proactively to any exposed party.

The public concerned shall be timely and intelligibly informed at the very start of the procedure for decision making on environmental matters.

The public shall be informed about the following:

- the intended activity and the application under review;
- decision options and the draft resolution;
- the state authority – the decision maker;
- established procedure (start of the procedure, options for participation, time and venue of the appointed public hearings, the state authority – the holder of information, availability of environmental information, the range of the intended activity, procedure of environmental impact assessment), including how and when such information may be provided).

The “Equator principles”

The “Equator principles” (EP) define requirements for the environmental protection, occupational health, safety and social responsibility adhered by over 50 financial institutions worldwide.

The EP apply to all projects, which CAPEX are equal or exceeding 10 million US dollars and cases when significant environmental and social impacts are expected.

EP provide for categorizing and environmental impacts assessment of projects (Principles 1 and 2). All category “A” projects require development and implementation of an Action

[1] The objective of ESPOO — assistance in holding public hearings between states that are parties to the Convention *in cases when activities performed in one country may cause potential environmental impact in the other country.* In relation to this project, trans- boundary impact is impossible therefore there is no need to describe in detail the main principles of this Convention.

Plan, which addresses environmental protection, safety and social responsibility (Principle 4), and a Plan for Consultations and Disclosure (Principle 5).

Additionally, the projects' financing requires creation and implementation of Grievance Mechanism (Principle 6).

EP propose pursuance of policies and standards applicable by IFC (Principle 3).

IFC Requirements

IFC is incorporated in the World Bank Group, and invests into private projects, non guaranteed by the national governments, and assists in attracting investments from other sources. Requirements to disclosure of information are defined in:

- Information Disclosure policy – defines principles and approaches of the investor (in this case – IFC) to disclosure of information;
- Social and environmental sustainability policy;
- Performance Standard 1: Social and Environmental Assessment and Management System.

The social and environmental sustainability policy and Performance Standard 1 defines principles and approaches of information disclosure by IFC clients. Performance Standard 1 sets for the necessity of public consultations' conducting when project impacted population is at risk associated with the project implementation.

The objective of public participation is to establish and maintain structural interaction with the local population. The nature and frequency of actions related to the public participation are determined by the level of the project-related risks and adverse impacts. It is necessary to ensure timely access to full and reliable eligibly presented information.

Effective consultations shall be:

- based on advance provision of required and adequate information including draft documents and plans;
- started at the early stage of social and environmental assessment;
- focused on identified risks and adverse impacts on social and natural environment, and on proposed measures and actions for their prevention, minimization, mitigation or compensation;
- conducted on a regular basis as the risks and impacts arise.

Measures for public consultations and disclosure under OOO «Tobol'sk-Polymer» polypropylene plant construction project

In pursuance of the IFC's PR guidelines, OOO «Tobol'sk-Polymer» developed a Public Consultation and Disclosure Plan (PCDP), that is given in Annex 20. The PCDP provided for identification of key stakeholders, which may impact, or on the contrary, be impacted during the project implementation, a pattern of liaison with these persons and organizations and described a procedure for disclosure of information on OOO «Tobol'sk-Polymer» construction project.

The main tasks of the Public Consultation and Disclosure Plan were:

- Identification of the key stakeholders and the liaison pattern;
- Development of a detailed plan of public consultations with representatives of the key stakeholders (both of the national and the local levels) at different stages of the project implementation;
- Development of a grievance mechanism for different stages of the project implementation;
- Estimation of resources required for implementation of the Public Consultations and Disclosure Plan.

Actions for public consultations' conducting are to be performed in 3 stages:

Stage I:

- Information about the future project, public consultations,
- Disclosure of the Terms of Reference for the ESIA preparation,
- Disclosure of the PCDP.

Stage II:

- Access to the ESIA draft version;
- Information about the grievance mechanism;
- Information about the future public hearings (time, venue).

Stage III:

- Public hearings' holding,
- Information about the grievance mechanism related to the public hearings' performance.

At the stage of the PCDP development a number of stakeholders involved in the project for construction of OOO «Tobol'sk-Polymer» polypropylene production plant. The key stakeholders were:

- Tobol'sk city duma;
- Tobol'sk Administration;
- Tobol'sk Branch of the Academy of Sciences;
- Employees of OOO «Tobol'sk-Polymer»;
- Higher education institutions of Tobol'sk;
- Communities in the project impact area (villages Sokolovka,. Mikhailovka, Denisovka).

Before holding public hearings representatives of OOO «Tobol'sk-Polymer" met with deputies of the Tobol'sk City Duma, the Head of Rospotrebnadzor's territorial branch in the city of Tobol'sk, Tobol'sky, Vachaisky, Uvatsky rayons (Deputy of Chief State Medical Officer of the Tyumen oblast), experts of the Rospotrebnadzor's territorial branch in Tobol'sk . The OOO «Tobol'sk-Polymer» management also made a presentation on the intended activity for construction of polypropylene production plant at the Tobol'sk Industrial Institute, branch of TNGU, the Tobol'sk biological station of RAS.

The main step in the process of public consultations and information disclosure were **Public hearings** held on 16.06.2008 by OOO «Tobol'sk-Polymer» together with the Tobol'sky Rayon Administration (see Minutes of Hearings attached). The hearings were attended by 220 people. In accordance with the public hearings' format accepted by the Tobol'sky Rayon Administration, the issues of the project compliance with the current RF legislation and the prepared ESIA documents as an appropriate justification of possibility of the intended activity were put to voting based on results of the event. The questions put forward for discussion were casted an affirmative vote. A copy of the Minutes of the public hearings is presented in Annex 18.

At all the stages of the public consultations all the project documents were open to general public:

- Community liaison office of OOO «Tobol'sk-Polymer» project;
- Website - www.sibur.ru;
- Tobol'sk Duma.

The public consultations performance also provided a grievance mechanism for the project. The public appeals and opinions may be communicated to the Company through:

- Helpline of OOO «Tobol'sk-Polymer»;
- Community liaison office of OOO «Tobol'sk-Polymer» project;
- Filling in a feedback form on website www.sibur.ru
- By e-mail: eco@sibur.ru

The main stages of the information disclosure were covered by the regional mass media: local newspapers «Sibirskaya panorama», «Tobol'skaya pravda», «Sodeistvie», «Tyumenskaya oblast' segodnya» etc, 15 articles were published about the project and the main stages of the public consultaions.

Further measures in the sphere of public relations and information disclosure

OOO «Tobol'sk-Polymer» is going to maintain public relations at further stages of the project implementation via mass media and information website www.sibur.ru where all the project-related information and contacts to address the public opinion, comments and questions about the project are to be posted.

10.0 MITIGATION MEASURES. RESIDUAL IMPACTS

The below itemized characteristics *of the project site, the project impact areas and the intended activities* are the most important in the context of planning actions for environmental monitoring and environmental impact mitigation.

- The project site will occupy the area of 122 ha, in the eastern part of the existing large industrial zone of OOO «Tobol'sk-Neftekhim» with broad network of motor roads, railways and pipelines.
- Previously part of the site was a brownfield. To date the site accommodates zones of old industrial infrastructure (including storage and transport facilities) and areas covered with heavy vegetation (bushes, trees, grass). The topography is man-induced, with occasional depressions.
- The nearest residential area is located at the distance of 4300 m northwestward of the project site and 1600 m from the nearest point of the calculated border of the project impact area (in the isoline of 0,05 MPC of chlorine) see Annex 7.
- The nearest SPNA – Abalaksky reserve – is located at the distance of 3000 m northeastward of the project site and 400 m from the nearest point of the calculated border of the project impact area (in the isoline of 0,05 MPC of chlorine) see Annex 7.
- The current ambient air quality of the project area is characterized with high levels of concentrations of pollutants including those to be emitted at the stages of construction and operation of OOO «Tobol'sk-Polymer». In particular, the background concentrations of nitrogen dioxide and carbon oxide are equal of the daily mean MPC values of these compounds established for the community air.
- Performance of OOO «Tobol'sk-Polymer» will not require adjustment of the borders of its sanitary protection zone (SPZ). According to calculations, air emissions from sources of OOO «Tobol'sk-Polymer» will not bring to additional exceedance of MPC values or the background values either within the SPZ or within the production site. Nine out of ten pollutants, which have equal concentration lines at the level of 0,05 MPC (adopted criterion for the project impact area) are not beyond the borders of the OOO «Tobol'sk-Neftekhim» SPZ either. The only exception is chlorine, which concentration in the surface air after the project commissioning may exceed 0,05 MPC during adverse meteorological conditions at the distance up to 1300 m eastward of the SPZ borders established in 2007.
- No detailed surveys for assessment of soil quality and the residual level of geological environment contaminations have been carried out on the site and within the project impact area, however, the status of the site, which had been a brownfield suggests occasional onsite contamination of topsoil, ground of the aeration zone and the upper aquifer. The topsoil on the site and the adjacent territories are apparently polluted with substances, which have been emitted by sources of OOO «Tobol'sk-Neftekhim» through the entire operation period. No data of this pollution level is available.

Environmental impact sources *at the construction stage* will be the following works:

- Dismantling some of the existing structures, removal of vegetation, fragments of the dismantled structures and debris from the site;

- Earth works (leveling, drilling, excavation, filling and dyking);
- New piles' driving and old piles' removing (if necessary), installation of concrete bases (foundation);
- Installation of building structures made of reinforced concrete, brick, etc., wall facing (including welding and other fire operations);
- Installation of equipment;
- Construction of auxiliary facilities;
- Construction and tie-in of the required engineering utilities' (drinking and process water, electricity, wastewater, natural gas, flue gases);
- Decoration of buildings; finishing and painting of building surfaces, structures, equipment.

It is appropriate to subdivide impacts produced by the operations into some groups (see Table 10-1).

Table 10-1. Groups of social impacts during construction stage..

Group of impacts	Brief description and assessment of impacts	Mitigation Measures	ESAP Sections
Chemical and noise pollution of the atmosphere	Construction works will be sources of noise, solid aerosols and gaseous pollutants, that may be nuisance for the local population and increase risk of inflicting health damage to personnel of OOO «Tobol'sk-Polymer», OOO «Tobol'sk-Neftekhim» and contracted organizations. Given that the nearest real estates are located at the distance of 4 km off the site, the major risk is gas-dust emissions and noise impact on the personnel working on the site. Reportedly, the extent of impact of exhaust gases by motor transport on the ambient air quality may be estimated as insignificant. In general, impacts related to motor transport flow and special machinery operation during implementation of preliminary, earth-moving, construction-installation and the related operations will be	To mitigate the mentioned impacts, measures for monitoring and prevention of emissions will be implemented together with measures for ensuring continual use of the relevant personal protection equipment by employees. Actions for monitoring and reduction of construction noises and chemical pollution of the air are part of the Environmental and Social Action Plan and the Environmental monitoring program.	1.1, 1.2, 9, 11

Group of impacts	Brief description and assessment of impacts	Mitigation Measures	ESAP Sections
	insignificant and short-time at the background of the major amount of vehicles daily visiting the sites of OOO «Tobol'sk-Neftekhim» and the TPP. Noise impact during construction will also be insignificant and short-time at the background of process noises produced by other production facilities of the industrial zone.		
Physical-mechanical transformations of topography, topsoil and the associated disturbance of vegetation cover.	Impacts of this group will mainly be localized within the land allotment for construction. The neighboring areas may suffer disturbance of topsoil, alterations of drainability, heat conducting, hydrophobic properties of soils, adverse exogenic processes.	Direct physical-mechanical impact of construction on topsoil of the adjacent areas may and must be fully excluded. In major extent this will be provided by using the existing road network and other infrastructure.	7.1, 7.2
Chemical contamination of topsoil, surface water bodies, the geological environment and the associated suppression of the vegetation cover.	Contamination of topsoil, surface water bodies (man-induced), and the upper aquifer may occur as a result of both secondary migration of the existing pollutants provoked by construction operations, and of nonpoint (with precipitations) or point (spills, leakages, etc.) entry of these substances during preliminary, construction-installation and the related works. Based on the available data on the intended production activity, the soil chemistry trends can be expected without exceedance of the thresholds maintaining the environmental condition of the local soils. No impact by OOO «Tobol'sk-Polymer» on topsoil and the	To reduce the relevant environmental risk, the detailed project execution plan will include actions ensuring compliance with the building standards and regulations, with regulations for hazardous materials' and wastes' storage, requirements for prompt confinement and abatement of detected past or present accidental contamination.	1.1, 1.2, 4, 5, 10

Group of impacts	Brief description and assessment of impacts	Mitigation Measures	ESAP Sections
	ground (growth of phyto-toxicity, environmentally significant migration of contaminants to the groundwater, etc) is expected.		
Landscape changes	The nature of the surrounding area, which accommodates production, transport and storage facilities, suggests that short-time adverse visual impacts will be minor for areas eastward to the site. As to the other viewpoints, the visual adverse impact level is expected to be still less, because the sight coverage is narrowed with other production facilities and structures of OOO «Tobol'sk-Neftekhim».		8.1
Impacts on social environment of the project location	To-date it is known that during the peak periods of construction works there will be up to 4000 workers present on the site.	The project provides for constructors' accommodation in two specially built construction camps, which exact location was unidentified during the ESIA preparation. The camps will have all the required conveniences for employees of OOO «Tobol'sk-Polymer» and the contracted organizations. The distance between the camps and the boundary of Tobol'sk will be not less than 10 km.	12.1, 12.2, 12.3

Impacts at the operation stage are considerably different from the construction impacts by their contents and structure, yet they are grouped similarly (see Table 10-2).

Table 10-2. Groups of social impacts during operation stage.

Group of impacts	Brief description and assessment of impacts	Mitigation Measures	ESAP Sections
Chemical and noise pollution of the atmosphere	Analysis of results of air emissions' dispersion and acoustic impacts of the designed stationary sources of the project facility showed that the operation impact of the plant on the atmospheric air will be within the permissible values and will not be contradictory to requirements of the sanitary standards and regulations on the atmospheric air protection and noise control. Additionally, the construction of the new polypropylene production plant will provide for reduction of air pollutants' emissions of OOO «Tobol'sk-Neftekhim» production facilities that will improve the ambient air quality of the area.	To mitigate the impacts, measures for monitoring and prevention of emissions will be implemented together with measures for ensuring continual use of the relevant personal protection equipment by employees. Actions for monitoring and reduction of construction noises and chemical pollution of the air are part of the Environmental and Social Action Plan and the Environmental monitoring program.	1.3, 1.2, 9, 11
Physical-mechanical transformations of topography, topsoil and the associated disturbance of vegetation cover.	Impacts of this group are estimated as minor. Direct physical-mechanical impact of operation on topsoil of the adjacent areas may and must be fully excluded.	In major extent this will be provided by using the existing road network and other infrastructure. Noncompliances will be identified and corrected when implementing the proposed environmental monitoring program.	–
Chemical contamination of topsoil, surface water bodies, the geological environment and the associated suppression of the vegetation cover.	No impacts on surface water bodes are expected at the operation stage. Contamination of topsoil and the upper aquifer may occur as a result of point (spills, leakages, seepage, etc.) entry of pollutants during equipment maintenance. Low intensity of air emissions from the plant does not	The proposed environmental monitoring program provides for regular inspection of topsoil condition in the impacted area and collection of soil and groundwater samples at the monitoring points. Additionally, the plant operation mode will provide measures for ensuring	1.3, 2, 3, 4, 5,

Group of impacts	Brief description and assessment of impacts	Mitigation Measures	ESAP Sections
	suggest significant changes of topsoil pollution level due to precipitations.	compliance with procedures for equipment maintenance, hazardous materials' and wastes' storage, prompt confinement and abatement of accidental pollution.	10, 11
Landscape changes	The nature of the surrounding area, which accommodates production, transport and storage facilities, suggests that adverse visual impacts related to installation of two high flare systems and other production facilities will be minor for areas eastward to the site. As to the other viewpoints, the visual adverse impact level is expected to be still less, because the sight coverage is narrowed with other production facilities and structures of OOO «Tobol'sk-Neftekhim».	Not required	8.2
Impacts on social environment of the project location	Expectedly, the total number of employed will be 600 people, the majority of which are local population. Some of employees will live in Tobol'sk, in a residential complex constructed with participation of the Company; foreign staff to be accommodated in hotels.	In general, the positive social-economic effect of the new plant's commissioning by many times exceeds potential adverse consequences related to increasing the load on the local social infrastructure, etc. To minimize the latter the project provides for certain actions (see the Plan).	12.1, 12.2, 12.3

The below Action Plan (Table 10-3) comprises a list of the most probable residual impacts on the natural and social environment of the project area, their impacts' rating, the proposed monitoring actions and estimation of their current costs.

Table 10-3. Environmental & Social Impact Mitigation Action Plan for OOO "Tobol'sk Polymer" Project

Environmental and social aspects	Impacts	Phase	Proposed mitigation in addition to the actions provided by the project	Residual Impact	Residual Impact Rating	Monitoring	Schedule/ Timeframes	Cost estimates
1. Air emissions	1.1. Pollution of the atmospheric air and topsoil with components of exhaust gases.	Construction	Regular diagnostic analysis of exhaust gases from vehicles.	Unavoidable atmospheric air pollution with exhaust gases by construction equipment and other special machinery within the limits of the technical regulations.	Minor adverse	Environmental monitoring program was developed	The entire construction phase	5000 Euro
	1.2. Pollution of the atmospheric air and topsoil with dust (fine particles of road cover materials, construction materials, loose substances, solid wastes, welding aerosol, paintwork aerosol, etc.)	Construction	In the summer time - periodic watering of roadbed and loose and other substances temporarily stored in the open areas, which may be dust sources. Limitation of speed of transport movement on unpaved roads. Proper maintenance of roadbed (for paved roads). Arrangement of wheel washing areas and other measures for prevention of ground carry-over to paved areas, timely cleanup of such areas. Vegetation of open ground of the site with the use of lawn grass mixtures and other inhibitors of deflation intensity	Dust pollution of the atmospheric air and vegetation cover (to be minimized by the provided actions)	Minor adverse	Supervision over compliance with regulations for work safety (WS), standards of occupational safety (OS), process safety (PS) and fire safety (FS). Some actions are incorporated into the environmental monitoring program (EM).	The entire construction phase	4000 Euro (for EM)
	1.3. The atmospheric air pollution with components emitted by the industrial facility and transport.	Operation	Implementation of engineering designs (reduction of flange joints, application of high-quality sealing materials, use of low-loss pumps, close-type drainage system); purchase and use of transport and other special machines equipped with engines of low emission toxicity; Regular diagnostic analysis of exhaust gas from transport.	Unavoidable atmospheric air pollution with exhaust gases by construction equipment and other special machinery within the limits of the technical regulations. Increase of technogenic load (concentration of chlorine, in a minor extent - chlorine hydride, hydrogen disulfide, hydrocarbons and other substances in the atmospheric air and precipitations) on the	Minor adverse Adjustment of the existing borders of the " Tobol'sk-Neftehim" SPZ is not required. Territories to be impacted (by 0,05 MPC level) are eastward of the SPZ	Environmental monitoring program was developed	The entire operation phase	7000 Euro per year

Environmental and social aspects	Impacts	Phase	Proposed mitigation in addition to the actions provided by the project	Residual Impact	Residual Impact Rating	Monitoring	Schedule/ Timeframes	Cost estimates
				territory adjacent to the site.				
2. Water supply	The project provides for using the Irtysh river water to be delivered via water supply network of OOO "Tobol'sk-Neftekhim". (See Section 6). The engineering designs suggest using a water circulation system, the system makeup with treated stormwater and metering of withdrawn water.	Operation	None proposed in addition to the actions provided by the project due to industrial surroundings of the site	No major impacts are expected	Not required	–	–	
3. Wastewater discharge	The engineering designs exclude discharge of wastewater, stormwater and drain or other water into surface water bodies, aquifers in the geological environment, on the surface (see Section 6.0)	Operation	None proposed in addition to the actions provided by the project due to industrial surroundings of the site	No major impacts are expected. There is a possibilty of local contamination of topsoil , ground of the aeration zone, the upper aquifer with substances migrating with rain, snow and drain waters of nonpoint discharge	The discharged wastewater composition will be monitored by OOO "Tobol'sk-Neftekhim". Groundwater quality to be monitored in accordance with the developed program	–	For groundwater monitoring: 10000-15000 Euro to establish a monitoring network and about 1500 Euro per year for observations	

Environmental and social aspects	Impacts	Phase	Proposed mitigation in addition to the actions provided by the project	Residual Impact	Residual Impact Rating	Monitoring	Schedule/ Timeframes	Cost estimates
4. Storage of raw materials and reagents 5. Waste generation and handling	The provided management of raw materials, reagents other matter and wastes does not propose major environmental impacts	Construction, operation	None proposed in addition to the actions provided by the project due to industrial surroundings of the site	No major impacts are expected. There is a possibilty of local contamination of topsoil , ground of the aeration zone, the upper aquifer as a result of precipitations infiltration via the areas of materials' and wastes' storage.		Raw materials, reagents, and wastes' storage areas are monitored by H&S Service of the Plant. Groundwater quality to be monitored in accordance with the developed program	The entire construction and operation phases	Provided in the design documentation
6. Landuse	Land withdrawal with impossibility of their further use for other purposes	Construction, operation	As agreed with the local authorities and supervisory organizations, none compensatory measure to be taken.	The expected damage is insignificant due to the site location within the contour of the existing petrochemical facility and low value of the soils on the site and the impacted area.		Not required	–	–
7. Preliminary earthmoving, construction-installation works on the site.	Change of thermal, water regime and physical properties of the site soils and the adjacent areas. Partial destruction of topsoil. Transformation of the natural terrain and development of adverse exogenic geological processes	Construction	Removal, temporary storage and backfilling of the fertile soil layer. Improvement and vegetation of the site upon completion of earthmoving and construction-installation works. Use of the existing road network and infrastructure only. Performance of all works strictly with the allocated land plot.			Environmental monitoring program was developed	The entire construction phase	4000 Euro per year
	Littering of territories with ferrous and nonferrous metal scrap, rags, tires, construction debris, etc.		Monitoring the condition of the territory for revealing unauthorized waste storage areas.	Compliance with building standards and regulations, equipment maintenance regulations, and timely implementation of corrective actions will minimize residual impacts.		Supervision over compliance with regulations for (WS), (OS), (PS) and (FS).	The entire construction phase	Provided in the design documentation
8. Construction of industrial buildings and structures	8.1. Change of landscape due to using cranes and other large-size machinery	Construction	None proposed due to industrial surroundings of the site	The impact may be considered insignificant due to the site location within the contour of the existing large petrochemical facility.		Not required	–	–