

Intended for

Irkutsk Oil Company, LLC

Date

September 2019

NON-TECHNICAL SUMMARY

IRKUTSK POLYMER PLANT

POLYETHYLENE PRODUCTION

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT



Bright ideas. Sustainable change.

RAMBOLL

Issue **2**
Date **September 2019**
Made by **Ramboll CIS**
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Version Control Log				
Revision	Revision description and status	Date	Checked by	Prepared by
1	Draft for internal discussion	18.09.19	IS	IS, OT, SCh, AIg
2	Draft for discussion with Client	23.09.19	IS, AD, YuK	IS, OT, SCh, AIg

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1. OBJECT OF THE ENVIRONMENTAL ASSESSMENT AND PURPOSE OF THE SUMMARY

This Summary presents the main findings of the assessment of environmental and social impacts of construction and operation of the proposed Polymer Production Facility (PPF) in Ust-Kut District of Irkutsk Region (*"the Project"*) in concise and generic form, and where possible without use of highly-technical niche language.

2. PROJECT INITIATOR

"Irkutsk Oil Company", LLC (INK) has been producing crude hydrocarbons in Irkutsk Region since 2004 and is the region's largest producer of oil. The Company is distinguished for its independent position in Russian market of hydrocarbons, commitment to moving from commodities export to domestic processing of extracted hydrocarbons, and active participation in Irkutsk Region socio-economic development programmes. Major part of the Company's prospective assets (including Markovsky and Yaraktinsky fields) is situated in Ust-Kut District, which is the main area of INK operations (Figure 1).

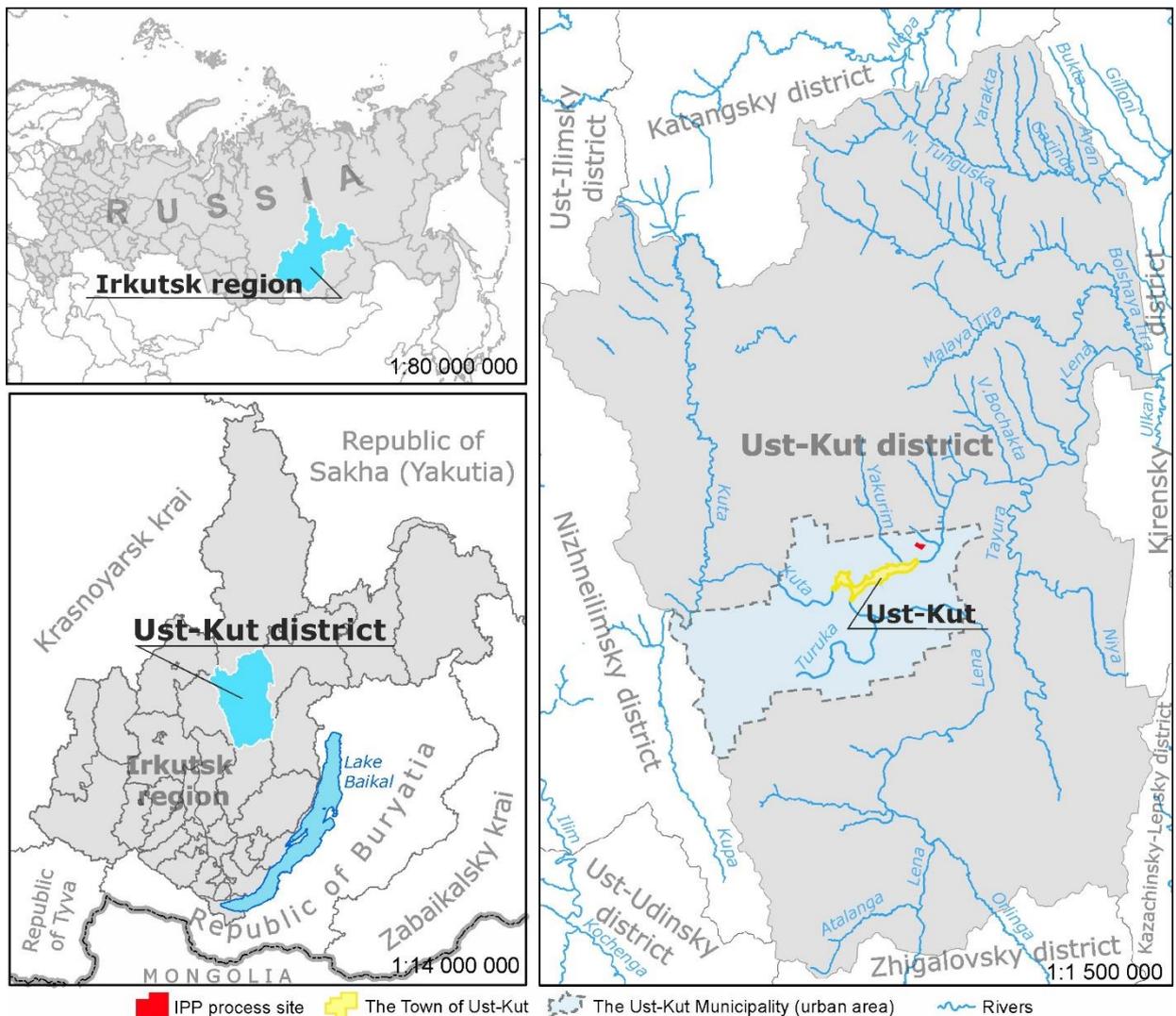


Figure 1: Irkutsk Oil Company's Operation Area

The achievements of INK, like annual growth of production volumes and exploration activities, implementation of innovative techniques including those reducing environmental and social

impacts, would not be feasible without extensive support from its partners in Russia and elsewhere, e.g. the European Bank for Reconstruction and Development (EBRD), Goldman Sachs International, Japan Oil, Gas and Metals National Corporation (JOGMEC), Baikal Bank of Sberbank of RF, Japanese companies ITOCHU Corporation and INPEX CORPORATION.

Engagement of the above parties in INK operations implies the need to match both Russian and the best international environmental standards and practices which is a top priority of the Irkutsk Oil Company. The main principles of the Health, Safety and Environment Policy of INK are:

- Preventing environmental pollution, injury, and illness of employees and the general public
- Minimizing the negative impact of operations and other activities on the environment
- Reducing operational risks
- Rationally using natural resources, introducing modern waste management technologies
- Improvement of the Integrated Management System which has been developed and implemented in line with requirements of international standards ISO 14001:2004 and OHSAS 18001:2007
- Making sure that contractors are compliant with the Health, Safety and Environment Policy of INK
- Improving the INK employees' skills, knowledge, and awareness in the field of health, safety, and the environment
- Direct dialogue with stakeholders through public discussions of results of assessment of proposed operations on the environment, disclosure in media and the Company's website
- Supporting the local population and indigenous peoples who live in places of INK's operations.

3. BRIEF BACKGROUND OF RAMBOLL CIS AS AUTHOR OF THE ENVIRONMENTAL AND SOCIAL ASSESSMENT

Ramboll company was established at the end of 2014 when a global leading environmental consultancy ENVIRON Corp. joined forces with Ramboll Group A/S, Northern Europe's leading provider of engineering, design, construction and associated consultancy services, to create a global practice called Ramboll Environment and Health. Ramboll Environment and Health division is responsible inter alia for environmental consultancy, including environmental and social impact assessments (ESIA) of future or existing operations.

As one of global leading consultancies providing environmental services to industrial and building projects, Ramboll has earned confidence of its partners for the ability to solve complex and pressing problems in the sphere of environmental protection, occupational health and safety, and in the social sphere. Ramboll has an impeccable reputation in its professional sphere, relies on the cutting-edge research and development experience, devises innovative approaches to assessment of environmental and social impacts of construction projects and a wide range of producing and processing industries. Independent science-first approach of Ramboll ensures that its strategic advice is objective and defensible.

Ramboll's network of experts includes more than 2,300 employees across 130 offices in 28 countries around the world. Russia is among the most important countries of Ramboll operations where the company is represented by Ramboll CIS LLC.

The company's operations are transparent, and its performance information can be accessed at the corporate website at <http://www.ramboll.com>. Experts working in Russian office of Ramboll CIS are especially strong in oil and gas sector and its associated branches where they

have developed and successfully implemented dozens of environmental impact assessment studies, prevention, mitigation and remediation plans, environmental and social and monitoring systems.

4. NEW POLYMER PRODUCTION FACILITY: ECONOMIC PROSPECTS

INK is developing deposits which, by the composition of product yield, are classified as oil-gas condensate fields and are characterized by a large share of ethane and heavier hydrocarbons in the gas fraction. In absence of gas transportation and consumption infrastructure in the district, flaring was the only option to dispose of the natural and associated petroleum gas produced by the Company after separation of formation fluids: flares or "fox tails" are a distinctive element of landscape in the majority of oil fields in Russia.

Needless to say that such practice means wastage of huge amounts of valuable hydrocarbons and at the same time pollution of air with gas flaring products. There are different ways to stop it. Firstly, INK since 2010 has been using the natural gas and associated petroleum gas reinjection technology to address two main objectives: reduction of impact of the field operations on atmospheric air, and increasing condensate recovery factor. Secondly, a part of produced gas is utilized for heat and electricity generation by local field power plants with the total capacity of about 100 MW.

Despite the efforts, economic losses caused by inability to use the gas stock are still huge. In fact the reinjected material is gas of unique composition that could be used for production of multiple mass consumption products which are currently imported. With the above drivers Irkutsk Oil Company developed its own Gas Business Development Programme focusses on enhancing opportunities for processing of hydrocarbons produced in Irkutsk Region instead of exporting them to other countries.

Associated petroleum gas from the Yarakinsky and Markovsky fields has a good ethylene and polyethylene production potential, due to the high content of ethane. That is why the proposed plant will produce two types of polymer as its final product: linear low density polyethylene (LLDPE) and high density polyethylene (HDPE) pellets.

The Polymer Production Facility is a key element in the INK Programme for utilization of gas resource of the Eastern Siberia - the INK Gas Business Development Programme (Figure 2). It will complement the existing or newly developed gas processing infrastructure of INK (as schematically illustrated in Figure 3) and utilize the benefits offered by the unique fraction composition of the produced gas (including associated petroleum gas) for production of marketable products. The wasteful and environmentally unfriendly practice of flaring will completely cease.

The most important economic and social effects of the Project can be summarized as follows:

- Significant reserves of natural gas and associated petroleum gas which are currently unclaimed, will be engaged for enhanced processing;
- Production of product with a high added value;
- Opportunity to develop new industrial facilities for manufacturing finished domestic and industrial products;
- Infrastructural development of Irkutsk Region's northern areas, in particular Ust-Kut District;
- Development of the regional labour market;
- Improvement of the living standard in Irkutsk Region, due to the increase in average wages and contributions to local public budgets;
- Possibility to improve reliability of heat and gas supply systems in the city of Ust-Kut.

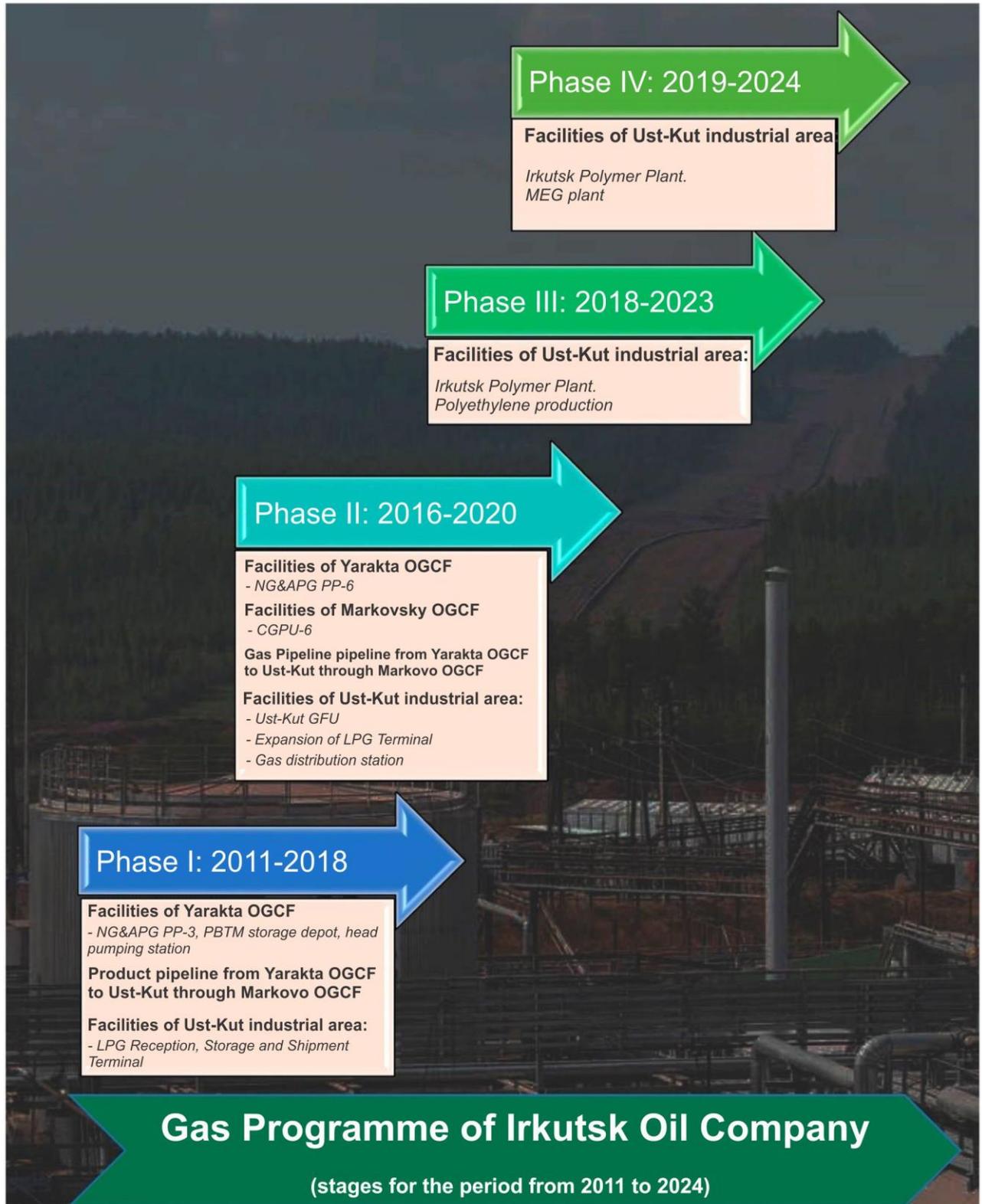


Figure 2: Phases of the Irkutsk Oil Company’s Gas Business Development Programme

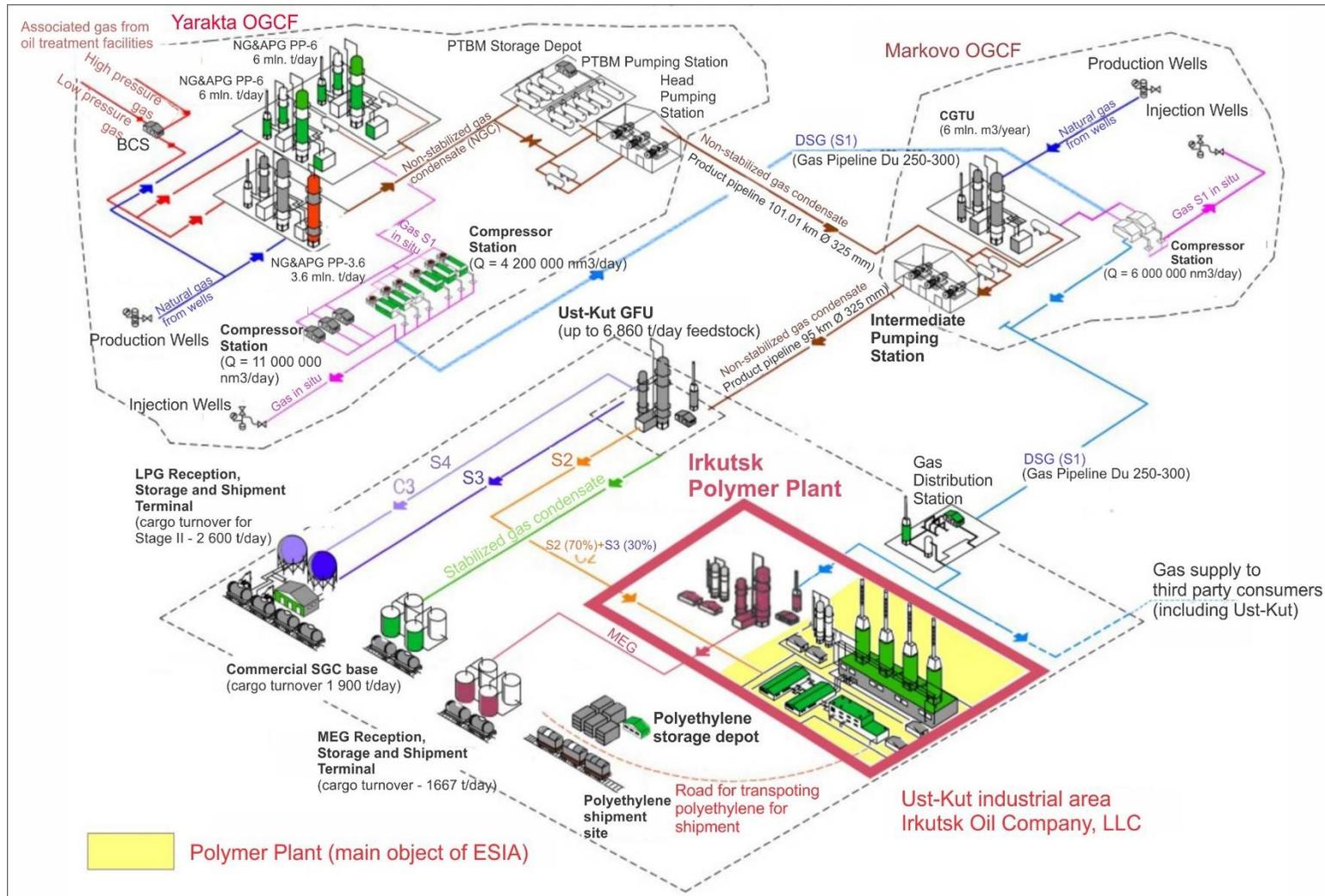


Figure 3: The role of the Polymer Plant in the INK Gas Business Development Programme

5. STRUCTURE OF THE FUTURE POLYMER PRODUCTION FACILITY

The main production facilities of the proposed Polymer Production Facility are ethylene, polyethylene and alpha-olefin (butene-1) units.

The ethylene unit with the planned capacity of 650 thousand t/year is intended for production of polymer grade ethylene using ethane and propane thermal cracking process, with average annual operation time of 8400 hours. The feedstock will consist of the gas mix from the primary gas processing units at the field sites, as well as recirculating ethane from the unit itself. By-products of the unit operation will be flue gas with high methane content (utilized as fuel for the cracking furnaces within the unit), and gasoline cut (C5+) and bottoms used in the Gas Chemical Integrated Plant.

Polyethylene unit is intended to produce linear low density polyethylene and high density polyethylene pellets by polymerization of ethylene and comonomers (butene-1 and/or hexene-1). Design capacity is 650 thousand tons of PE pellets per year.

The products will be packed in 25 kg packages or loaded in bulk containers, and transported by trucks to the packed PE reception, storage and offloading facilities, from where it will be dispatched to customers by railway.

Auxiliary systems of the Plant will include:

- Boiler house
- Electric substation and power distribution system
- Process piping
- Tank farms with pumping stations and flash tanks
- Storage facilities
- Flare system
- Polyethylene loading platform
- Office and laboratory buildings
- Water supply and wastewater disposal systems (including water intake, water and wastewater treatment and pumping)
- Fire suppression systems and other infrastructure

6. MAIN PREREQUISITES FOR THE PLANT CONSTRUCTION NEAR UST-KUT

Discussion of the Project significance at the regional level was initiated in 2014, and its prospects are instituted in the Irkutsk Region Investment Strategy for the period until 2025 (Protocol of the Investment Council Meeting at the Government of Irkutsk Region of 05.09.2014). Despite the economic crisis and general decline in operations, the main efforts of INK are still focussed on further development of local processing of the produced hydrocarbons, increasing added value of the marketable products, process efficiency and environmental safety of the business operations.

The main processing capacities for natural and associated gas will be provided directly in the field sites of Yarakinsky and Markovsky in Ust-Kut District. For further utilization and dispatch to consumers, the gas components will be transported to Ust-Kut city via a system of underground pipelines which has been largely implemented by present. Liquefied hydrocarbons storage and export facilities (LPG Terminal) are located in the same area. Design for the facilities is approved by the government expert review, all required approvals and permits have been issued, and implementation is in progress. First line of the LPG Terminal facilities with LPG tanks capacity of 2400m³ was commissioned in 2018; the second line will become operational in 2019.

Ust-Kut was founded in 18th century as a stockade town and a centre of salt-making industry and gradually developed to become one of the main transport hubs in Western Siberia. Nowadays it is experiencing "renaissance" due to development of oil and gas sector. This process is accompanied by "advance on taiga" which clearly means inevitable reduction of some resources, however this negative effect is far less significant than the consequences of other, more extensive operations, e.g. forest industry.

Irkutsk Oil Company has been active in the territory of Ust-Kut district for many years, and the Company management is committed to solve both environmental and socio-economic problems facing the municipalities affected by operations of INK. A wealth of experience has been gained in the sphere of meaningful interaction with non-government organizations of the city and district, cooperation with local administrations and public authorities, public discussions and monitoring of all aspects of the Company operations.

There exist objective reasons for the mixed feelings of local communities and non-government organizations in the city and district about development of oil and gas industry in the region. Environmental requirements have been neglected by major land users in the city and district for decades, which resulted in severe problems e.g. air pollution in Ust-Kut, particularly in winter, depletion of surface water resource, forest fires, reduction of populations of valuable commercial species of animals and fish, littering of vast territories.

With this background any industrial development initiative can be received with suspicion, and INK is committed to ensure the maximum transparency of its strategic efforts and select project solutions with the best environmental performance.

The gas processing strategy of INK clearly relies on the unique position of Ust-Kut which has developed during the past decades into important transport hub and wood processing centre of Western Siberia.

On the other hand, the most environmentally-dangerous industrial facilities will still be kept at the field sites which are separated from the city by dozens and hundreds of kilometres, while the proposed new facilities including the Polymer Production Facility will be constructed outside the city, at a distance of several kilometres from residential areas (Figure 4) and in compliance with the applicable sanitary and hygienic standards. The key advantage of the selected option is its location in merchantable forest land. Therefore, the sensitive ecosystems of spawning protection forests in the Lena River valley are no more considered for construction of the Project facilities and impact on them will be minimised. With the current configuration, the only element to be constructed within the protective forest belt is the road connection between the upper and lower Project areas.

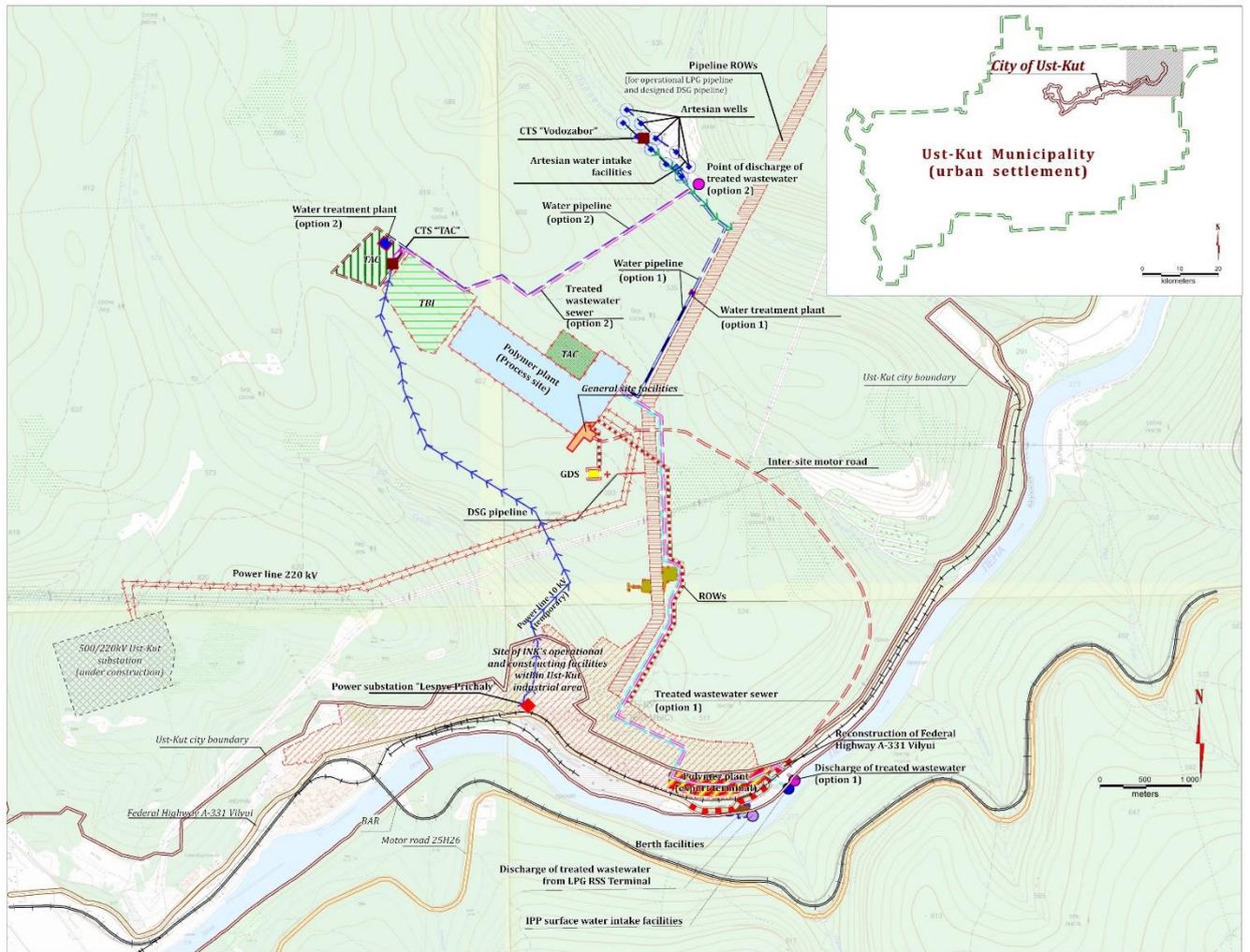


Figure 4: Main operations areas of the proposed Polymer Production Facility

7. PROJECT'S AREA OF INFLUENCE

Spatial area of influence of the future Polymer Production Facility at the construction and operation phase consists of several parts. Central zone of the anticipated influence is the land allocated for the proposed construction project (Figure 4). INK has, in line with its enhancement plans, acquired several designated forest land plots under a 49-years lease agreement. The plots constitute all together a 430.49 ha woodland area located about 4 km north from other land plots that have been leased by the Company under separate agreements, for its gas transportation system, LNG facilities, gas processing plant, and several transport corridors with the total area of 250 ha. The new plots are intended for construction of two production facilities - the Polymer Production Facility (object of the ESIA) and the MEG Plant - that will jointly operate as an integrated production facility, the Irkutsk Polymer Plant.

Area specifically allocated for the Polymer Production Facility is about 110 ha, to be occupied by the main operational area (Area No.1, the "upper site") comprising three process units of the future PE plant, with a system of auxiliary buildings and facilities (ethane and ethylene storage tank farm, boiler house, flare system, water recycling system, wastewater treatment facilities, etc.). The adjoining utilities area of about 4 ha will accommodate various services (fire guard, medical), a canteen, CDER facilities, etc.

The lower site (Area No.2) of about 20 ha is intended for the polyethylene offloading terminal and storage facilities.

Linear infrastructure facilities (roads, buffer belts along power transmission lines, process pipelines) will occupy the total area of 357 ha. Land plots of 0.9 ha have been allocated for construction of the river water main from the Lena River and the treated effluent discharge pipeline.

The following arrangements have been identified for the temporary facilities at the construction phase:

- 27.5 ha site adjoining Operational Area No.1 - for the temporary accommodation compound (TAC) for 7000 persons;
- 62 ha site adjoining Operational Area No.1 - for the temporary site facilities (VZiS);
- 1.8 ha onshore and 1.1 ha water area - for the large equipment unloading berth on the Lena River;
- 2.9 ha (tentative area size) for construction of the high voltage power transmission line OHTL 10kV to TAC.

Drinking water supply for all facilities will be provided from artesian wells in the Polovinnaya River valley (Area No.4), to the north of the Operational Area No.1.

Therefore, estimated total area allocated for the PPF facilities is 584 ha (100 %) including 134.0 ha (23 %) for the process areas, 358 ha (61 %) for the linear facilities, and 92 ha (16 %) for temporary facilities at the construction phase.

The land use conditions in the forest areas not affected by the construction will change due to establishment of sanitary protection zone of the polymer plant. Standard size of SPZ for the Plant is 1000 m from boundary of the operations site (Figure 5). The concept of SPZ implies that concentrations of pollutants emitted to air may exceed MPC standards, and harmful physical impacts (i.e. noise, vibrations, electromagnetic fields) may exceed the maximum permissible levels established for regulated territories.

Besides SPZ, other use-restricted zones (URZ) will be also established, in order to ensure safe operation of the future polymer plant, provide protective sanitary zones of the ground water wells, etc. A reasonable assessment of outline contour of the influence area with the land allocated for the Project and the sanitary protection zone and other URZs associated with the polymer plant being in its centre can be obtained using the corresponding criterion – the isoline of 0.05 MPC level of the most common pollutants (based on calculation) from the emission source (exclusively of background concentrations). According to estimations made by Ramboll based on experience of similar projects, the size of such area of influence may be within the range of 5 to 10 km, depending direction, and the substance which distribution will define the contour of the influence of area will most probably be nitrogen dioxide. All other air impacts, including acoustic, will cause significant effects only within such area.

The main impacts on geological environment and exogenic processes will be manifested only in the area of Sukhoy and Gremyachy creeks and the left bank of River Lena. All impacts on local soil and vegetation (forest felling, excavations) will be localized within the land allocated for the Project. The forest fire risks will increase due to the works being conducted in the vicinity of forests.

The assessment of the Project's area of influence is subject to verification at further stages of the design development, as the emissions have been assessed using input data from similar projects - OOO "Tobolsk-Polymer" and PAO "NizhnekamskNeftekhim" also producing granulated polymers. Both of these plants have been designed with due consideration of the applicable international and Russian environmental requirements; no deviations from the designed impact levels on the atmospheric air quality have been recorded after commissioning.

For the surface water body which is considered as the future source of water supply and recipient of treated wastewater discharges, the boundaries of the influence area will be defined in terms of downstream propagation of polluting substances and physical impacts (warming effect, turbulence, reduction of water flow, agitation of bottom sediments, etc.). Competent

authorities have defined basic location for the background monitoring and pollution monitoring stations associated with the future discharge sewer of the LPG facilities on River Lena: 500 m upstream and downstream of the proposed discharge point. In this case, due to the fact that the area of proposed Polymer Production Facility is drained by two creeks (Sukhoy and Gremyachy) being left-bank tributaries of the Lena River, it is proposed to set the downstream boundary of the Project's area of influence at the monitoring section located 500 m downstream of the mouth of Gremyachy creek. The distance from the future water intake and wastewater discharge facilities to the proposed monitoring section is 3.2-3.5 km.

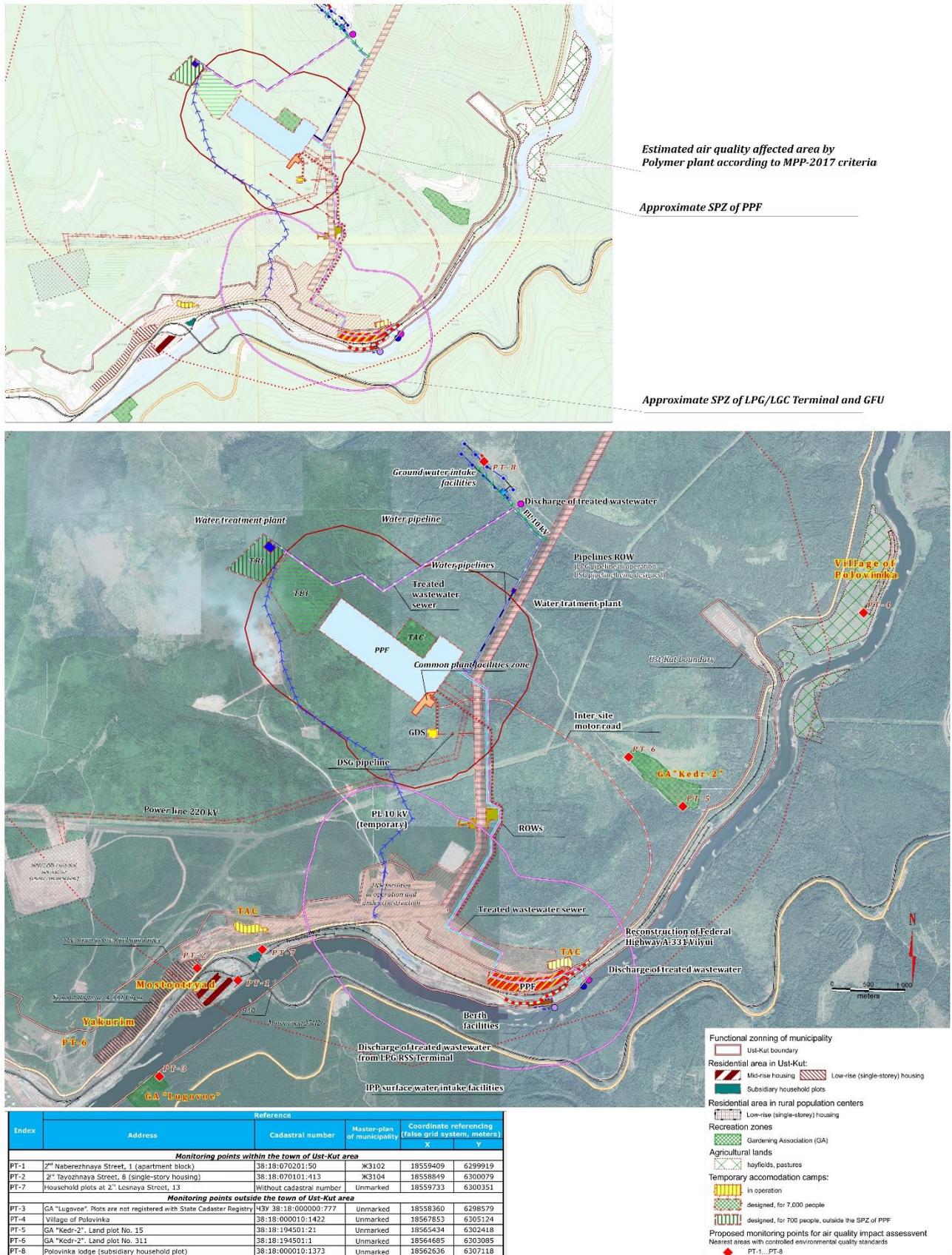


Figure 5: Sanitary protection zones of the PPF and LPG facilities, and the Project area of influence

The anticipated impacts of the Project on socio-economic situation in the area will primarily affect the eastern part of Ust-Kut City Municipality including Mostootryad and Yakurim residential areas and adjacent subsidiary gardens, as well as industrial, transport and logistics facilities on the left bank of the Lena River.

The Project-affected forest lands are managed by the Ust-Kut Forestry Department of the Forest Resource Ministry of Irkutsk Region. The area of influence of the future polymer plant will also cover rural settlements of Ust-Kut District Municipality, and gardening cooperatives with the majority of land users apparently being residents of Ust-Kut city.

More details about land use structure in the proposed location area of the Polymer Plant, including graphical materials, are provided in the ESIA report.

8. AFFECTED PARTIES: IDENTIFICATION

In order to get better understanding of overall situation around the Project, Ramboll divided all stakeholders of the proposed operations into three categories as follows:

- Parties directly affected by the Project impacts; and
- Parties which are not directly affected by the Project and not engaged in its implementation, but still have some interests in the Project, and/or are capable of influencing the Project implementation process

The first category includes the parties who are most vulnerable to potential negative consequences of the proposed operations – local communities in Ust-Kut city (particularly residents of Yakurim, Mostootryad, YGU, Staraya REB / Novaya REB areas), land users within the Kedr-2 Gardening Association, recreational hunters and fishers, and Project personnel.

Parties in the 2nd category are *a-priori* independent, and they can influence the Project implementation depending on specific circumstances. This category includes local authorities and local branches of federal and regional authorities, companies operating in different sectors, civil society organizations, media, and residents of more remote areas within Ust-Kut district. Ramboll Environ also belongs to this category.

Detailed classification of stakeholders is provided in the ESIA report. It should be noted that the list and categorization of stakeholders may change with time, therefore, it is subject to regular updating in the process of implementation and review of the Company's Stakeholder Engagement Plan.

9. DISCLOSURE OF PROJECT INFORMATION: CURRENT PRACTICE AND COMMITMENTS OF THE IRKUTSK OIL COMPANY

In 2013 INK adopted a procedure for "Internal and external communication within the Integrated Management System". The document defines the procedure for providing to external and internal stakeholders of environmental, social, health and safety information, as well as other information within the scope of the Integrated Management System (IMS). The procedure is applicable to activities of INK and also its affiliates. The Company has further adopted a set of other documents that regulate health and safety, environmental and social requirements to contractors.

The Company's interaction with external stakeholders on environmental and social matters is structured and regulated by the following internal regulations of INK:

- Stakeholder Engagement Plan with description of the main principles of engagement and the necessary related activities;

- Instruction "On the procedure for informing media, Russian and international community about operations of INK LLC";
- Documentation procedure PR 4.4.3-01-2016 "Arrangement of internal and external relations within the scope of Integrated Management System";
- Instruction "On the public grievance procedure of INK LLC";
- Stakeholder Grievance Log.

INK activities for interaction with external stakeholders are focused on the following directions:

- Liaison with public authorities and non-governmental organizations in the areas of the Company's operations;
- Interaction with communities of indigenous small-numbered peoples of the North at the hydrocarbon deposits development sites;
- Disclosure of information on socio-economic cooperation and environmental activities to all stakeholders on request;
- Preparation and arrangement of public hearings and discussions in situations provided by Russian law or international practice of information disclosure;
- Managing written and verbal public grievances and queries;
- Participation in socio-economic development of Ust-Kut District and Irkutsk Region through the corporate charity programmes.

The following information resources are used for disclosure of results of INK stakeholder engagement activities:

- Corporate newsletter "Vestnik INK";
- Corporate website www.irkutskoil.ru.

The list of disclosure channels which INK plans to use for the Project includes (but is not limited to) the following:

- Public hearings and meetings;
- Publications on the Company website www.irkutskoil.ru/;
- Production and distribution of printed information – brochures, leaflets, etc.;
- Personal contacts with various stakeholders at official receptions, personal meetings, "hot lines", "round table" discussions;
- Publications in media.

The Public Relations Unit bears the main responsibility for stakeholder engagement process. The Unit is part of the Department for Regional Policy and Authorities Liaison.

In particular, the Unit performs the following functions:

- Handling of grievances and queries;
- Arrangement and coordination of external stakeholder engagement activities on the Project-related matters;
- Preparation and holding of public hearings and meetings;
- Communications with external stakeholders.

The Company regularly arranges stakeholder engagement activities within the framework of its own Gas Business Development Programme. In particular 5 public discussions of ESIA results for various development projects, as well as 3 additional discussion meetings on community requests were held in 2016. In December 2017 the Company conducted public hearings on the design for the Ust-Kut Gas Fractioning Unit, that included disclosure of the project information, presentations, and a Q&A session.

Public discussions were held in Ust-Kut city in 2013 and 2014, in relation to the development plans for the liquid hydrocarbons storage and export facilities (LPG Facilities) and gas transportation system. Discussion of future prospects of the INK Gas Business Development Programme including extension of gas processing capacities at Yarakinsky and Marakovsky oil and gas condensate fields was arranged in the city in March 2017.

In May 2017 and March 2019 Irkutsk Oil Company arranged a series of consultation meetings between Ramboll and potential stakeholders of the Project including:

- Ust-Kut City Administration of the Irkutsk Region;
- Ust-Kut Municipal District Administration of the Irkutsk Region;
- Committee on Emergencies for Ust-Kut District;
- Municipal Public Institution "Unified Duty-Dispatching Service";
- RSFHF "Ust-Kut District Hospital";
- TRK "Ust-Kut Dialog";
- Ust-Kut city branch of Irkutsk Region Association of Hunters and Fishermen;
- Irkutsk Region Wildlife Management Service;
- Ust-Kut department of the Russian Ministry of Internal Affairs;
- Branch of FBHI "Centre of hygiene and epidemiology in Irkutsk Region" for Ust-Kut city, and Ust-Kut, Kazachinsko-Lensky and Kirensky districts;
- Council of Veterans, primary organization in the Lena residential area;
- MPCJ "Ust-Kut Historical Museum".

Consultations were arranged for collection of baseline information on the Project area, concerns of the Project stakeholders, and for identification of potential cumulative environmental and social impacts. More details of the meetings conducted so far are provided in the ESIA report.

Thus it can be concluded that Irkutsk Oil Company runs its operations in Ust-Kut city and district in largely transparent manner (i.e. definitely the most transparent among all companies in the district) and is focused to disclose information about its current projects to all affected parties.

Irkutsk Oil Company should apply its best efforts to provide stakeholders with adequate and comprehensive information about the Project details and its potential impacts, both positive and negative, as well as the measure to be taken by the Company to prevent, mitigate and remediate the latter. Information disclosure to stakeholders will be provided using various channels including the Stakeholder Engagement Plan which is adopted and regularly updated as part of the ESIA package.

10. KEY ANTICIPATED IMPACTS OF THE PROJECT

10.1. Changes in Ust-Kut District Land Use Conditions

The site selection for the Polymer Plant Project and associated facilities has been determined by the Irkutsk Oil Company with due consideration of the following factors:

- Combination of favorable economic and geographical conditions;
- The existing regulatory limitations associated with the location of archaeological sites, water protection zones, and riverside (spawning) protection forest belts;
- Planned regulatory limitations relating to zones with a special status and requirements associated with gas transportation system and electric power distribution networks (including sanitary protection zones, other protective zones, restricted development areas, etc.).

An important environmental and landscape feature of the project area is the lack of specially protected nature territories of local, regional and federal significance or any areas with traditional forms of natural resources usage within the boundaries of the land allocated for the project construction and in its immediate vicinity. Designated nature conservation areas nearest to the site of the Irkutsk Polymer Plant are shown in Figure 6.

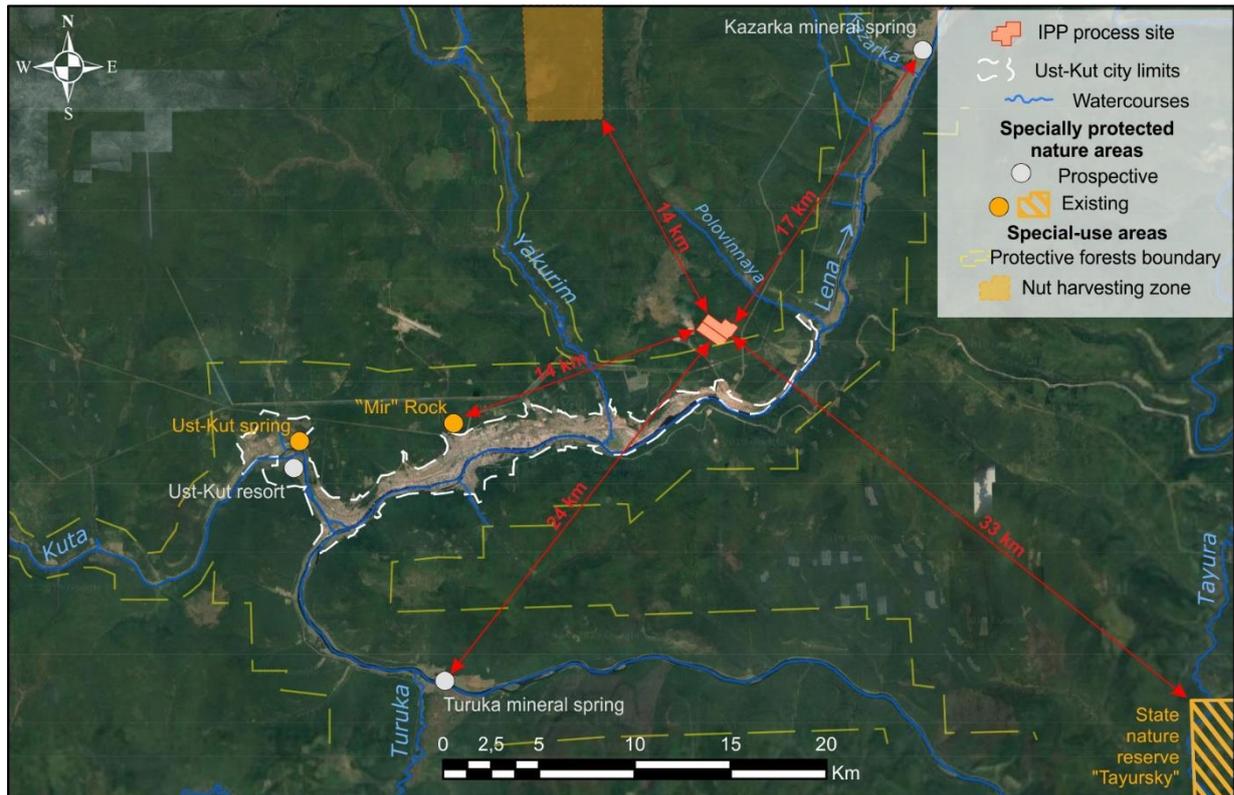


Figure 6: Designated nature conservation areas in the Project area

The dimensions of the Project land area have been determined by the Irkutsk Oil Company to minimize the total area of the allocated land and optimize the width of the construction strips for linear facilities. The total forest land area controlled by the Ust-Kut Forestry Department is 4.535 million ha, of which 4.358 million ha is the area covered by forests. A land area of approximately 486 ha has been allocated for the planned areal and linear Project facilities, and will be reclassified from the forest fund land category to the category of industry. This land makes up less than 0.1% of the total forest land managed by the Forestry Department. Therefore, land-clearing of the concerned forest areas will not result in any noticeable decrease in the proportion of land covered by forests in the district (currently it is estimated at 96%) and in any changes in the forest resources.

In general, the planned location of the polymer plant facilities appears to be optimal from the viewpoint of minimization of land acquisition and requirements associated with the existing and planned facility, because the neighbourhood of other gas transport, processing, storage and shipment facilities owned by the Irkutsk Oil Company will permit a reduction in the overall size of the zones of influence, a major portion of which will overlap each other.

In comparison with the total land area of the affected municipalities and the forest fund land area of the Ust-Kut Forestry Department, the area of the alienated land does not appear to be significant. At the same time, it is expected that the concentration of industrial and transport facilities will be high, including the gas trunk pipeline and a major gas chemical integrated facility, which will result in a substantial transformation of natural areas within the plots allocated for the Project facilities.

As was mentioned above, the land use conditions in the forest areas not affected by the construction will change due to establishment of sanitary protection zones of the polymer plant. Standard SPZ of the polymer plant will be 1000m wide and occupy an area of approximately 900 ha. The SPZ regime implies a ban on presence of certain sensitive facilities, such as residential houses, education and healthcare facilities, children's summer camps and centres, leisure bases, various recreational areas, etc. No sensitive facilities are currently present or planned within 3 km zone from the designed main PPF operations site.

10.2. Pollution Emissions to Air and Harmful Physical Impacts

Preliminary assessment of potential air quality impact of the emission sources at the planned polymer plant concluded that at the operational phase the maximum ground level concentrations will not exceed the permissible limits for the regulated territories. Emissions of nitrogen dioxide and carbon monoxide will have especially significant impact on the atmospheric air. A more accurate assessment will be made at the stage of design documents development, using detailed information on pollution emissions from operating polymer plant. Emission limits for the Plant will be set considering the performance values determined for similar facilities using the best available technologies.

The main contribution to the atmospheric air pollution will be made by pyrolysis furnaces, flare systems, and the boiler house. In normal operation situation, the main equipment will operate under high pressure and temperature, therefore, uncontrolled leaks of volatile organic compounds (VOC) will be avoided. A high proportion of particulate matter emissions is expected during the construction phase.

Both construction activities and the Project operations will generate noise and vibrations which may be harmful to health of personnel of the Company and contractors on site. Various measures will be adopted in line with the applicable safety regulations to minimize potential impact on workers' health, e.g. provision of personal protective equipment. Given the mutual location of the Project sites and the nearest residential areas, potential impact on local communities is assessed as minimal.

10.3. Impact on Soil

All potentially possible types of impacts on the soil cover can be divided into three groups:

1. Impact on soil resources in the subject area associated with withdrawal of some soil ranges for construction of the polymer plant facilities. Prior to the Project implementation, the withdrawn land areas had not been used for any commercial purposes (forested areas, sites occupied by technical facilities to be dismantled, etc.), including commercial hunting. The economic loss associated with allocation of the mentioned soil ranges for construction of industrial facilities will be insignificant. To minimize this loss, it will be required to strip the fertile topsoil layer (FTL) and stockpile it in conformity with the applicable regulatory requirements. Assessment of the topsoil layer thickness should be the subject of soil investigations within the framework of the engineering surveys to be conducted prior to the project design development for the Polymer Production Facility. The areas to be used on a short-term basis during the construction phase for temporary facilities will be subject to land reclamation and returned to the respective lessors with due consideration of their requirements with regard to the land condition and the planned subsequent land use. The main objective of reclamation of the disturbed land within the protection zones of the planned facilities will be conservation of environmental properties. Depending on the lessors' requirements it may be required in some areas to carry out reforestation, reclamation for the purpose of subsequent construction (i.e. without biological reclamation) or sanitary / hygienic reclamation (in areas where historic pollution would be detected).

2. Mechanical disturbance of the soil cover. The soils that are the main component of the biocenosis of the developed area will be impacted in the process of installation of the off-site engineering networks, road construction, as well as construction of main and auxiliary facilities. The following aspects should be emphasized in the project design documents:

- Specified limitation of soil cover disturbance in the areas leased on a long-term basis in the process of areas facilities construction; disturbance of the land areas leased on a short-term basis when excavating trenches and providing terraces for installation of off-site engineering lines;

- Unauthorized soil cover disturbance associated, for example, with unauthorized traffic of construction machinery off the specially provided road network and execution of construction work beyond the boundaries of the allocated land areas.

In case of mechanical disturbance of the soil profile it is potentially possible that the upper soil horizons determining the soil fertility would be subjected to fragmentary destruction; materials from different soil horizons would be blended resulting in a lower level of the natural soil fertility. Movement of construction machinery within the construction strip can result in partial or complete destruction of the soil cover. Wind and water erosion of soil in areas with disturbed soil cover can cause loss of fertile soil.

The impact of this type will be localized within the land allocated for the Project and take place primarily during the construction phase. In any adjacent areas the impact be in the form of local physical disturbance of the soil cover, affected drainage of soils and subsoil horizons, changes in the thermal conductivity, hydrophobic properties of soils, and activation of adverse exogenous processes. Any direct physical and mechanical impact of construction activities on the soil cover in the areas adjacent to the construction sites can and should be completely prevented.

3. Soil cover contamination can be caused by secondary migration of pollutants already present in the soil cover and geological environment and induced by construction activities or as a result of scattered (with atmospheric precipitation) or concentrated (spills, leakages, etc.) pollutants in the process of pre-construction, construction, installation and associated works, as well as in the process of operation of the polymer plant and associated facilities.

It may be assumed on the basis of the available information relating to the character of the planned activities that any changes in the chemical composition of soils within the zone affected by the planned facilities would be at a level not exceeding the threshold values ensuring conservation of the natural status of local soils. No other additional significant impact of construction sites is expected on the soil cover and land in the adjacent areas (an increase in the phytotoxicity, release of pollutants into groundwater, etc.). To reduce the respective environmental risk the Project design should stipulate measures aimed at supervision over compliance with the applicable construction norms and rules, regulations relating to storage of hazardous materials and wastes, as well as measures for prompt response to and elimination of consequences of any detected historic or current accidental contamination.

10.4. Impact on Geological Environment

Under the given conditions, the stability of the geological environment in relation to technogenic impacts is dependent to a certain degree on development of adverse exogenous geological processes (EGP) and the degree of protection of the exploited aquifers against contamination.

Most impacts on the geological environment will be of physical and mechanical nature, and will facilitate development of exogenous geological processes. Especially hazardous for the subject area are weathering and seasonal cryogenesis processes (throughout the area), surface erosion (on slopes composed of sandy silt/clayey deluvial material), gully erosion (very localized, in areas with significant thickness of sandy silt/clayey deposits and in case of favourable combinations of slopes) and flooding (Lena River floodplain). Furthermore, karst/suffusion and other engineering processes can develop in localized areas within the outlines of structures constructed in the ground and excavations.

In addition, construction and subsequent operation of the planned facilities will have an impact on the thermal conditions of the ground, but since there is no permafrost ground in the subject area, the thermal impact will be limited to seasonal changes in ground freezing and thawing and will not provoke development of any hazardous exogenous geological processes and hydrologic phenomena.

The above-listed impacts on the geological environment and EGP should be taken into consideration in the process of planning the environment protection measures, most of which have only indirect relation to the geological environment proper and are related to the contacting soil and vegetation, and surface water bodies.

Predicted impacts of the polymer plant construction and operation on the geological environment will remain mainly localized, i.e. associated directly with the respective sites and linear facilities, and of low significance for the scale of a geological engineering district and sub-district.

Of special significance is expected to be secondary intensification of hazardous exogenous processes and hydrologic phenomena, first of all slope, suffusion and karst processes, and for the facilities in operational area No. 2 also flooding. These processes can affect areas adjacent to the land allocated for the Project. When the development of secondary exogenous processes reaches its maximum the propagation of the process from the construction area will be limited by the Lena River valley in the south and south-east, by the overall ascending slope in the north, by the valley of one of Lena's tributaries in the north-east and by a complex of linear and areal engineering facilities in the west and south-west. The horizontal component of the contaminants migration streams within the geological environment can be associated with the most shallow water-bearing horizon, which does not extend in a massive form throughout the interfluvial area and on the wall slopes of the valley. On the contrary, in the areas located on the first above-floodplain terrace, in the high and low floodplain of the Lena River, it is assumed that a horizontally consistent water-bearing horizon is present, which is recharged by surface runoff and is hydraulically associated through infiltration processes with the Lena River streambed.

10.5. Surface Water Impact

The main impacts on water resource during operation of the Polymer Production Facility include water abstraction from natural sources, and discharge of waste water to surface water bodies.

Drinking water for the Project facilities will be provided from ground water wells in the Polovinnaya river valley. Technical water will be supplied from the Lena River. Design capacity of the future PPF water intake facilities on the Lena River is 900 m³/h and may be extended to 2500 m³/h. As the minimum daily average water flow in the Lena River (99% probability) at the water intake is 37.2 m³/s, proportion of water abstraction volume will not be more than 2% of the total river flow in the worst case.

A water recycling system is provided to minimise abstraction from the Lena River. Recycled water will be used for cooling of within the process units, boiler house, compressors and other equipment. Makeup water for the water recycling system will be provided as a mixture of river water from the Lena River and treated stormwater. Rain and melt water will be fed into the river water pipelines and mechanically treated before utilization in the process water supply system. Therefore, no stormwater will be discharged to recipient water body, and at the same time river water abstraction will be reduced.

In normal operation situation, the total volume of treated sanitary and industrial wastewater and stormwater runoff from industrial sites will be about 1800–2000 m³/h. Recipient surface water body for disposal of treated wastewater has not been identified by present. Two effluent discharge options are being considered: (1) the Lena River or (2) the Polovinnaya River.

All wastewater flows including sanitary and industrial wastewater, runoff from the industrial sites and stormwater will be subjected to multistage treatment and disinfection at the wastewater treatment facilities to be constructed at the Plant site. Taking into account the effluent quality at the discharge outlet compliant with the most stringent standards, the impact of treated wastewater discharges on water quality in either recipient river (i.e. Lena or

Polovinnaya) can be considered as minor. Relocation of the treated wastewater discharge to the Polovinnaya River will reduce the water quality impact on the Lena River to **negligible**.

Wastewater discharge may also have a thermal pollution effect on the recipient water body (due to the difference in temperature of the river water and discharged effluent), which may cause negative changes in hydrological conditions. In view of the fact that storm and melt water quantity is negligible during the winter and summer low-water periods, the main impact on hydrological conditions in the recipient water bodies will be caused by the treated process wastewater discharges. In the worst situation with river water flow as low as 37 m³/s, contribution of treated wastewater will not exceed 1.5% of the total flow, and will not have any notable impact on hydrological conditions in the Lena River.

Treated wastewater will have a more significant impact on hydrological conditions in the recipient if discharged into the Polovinnaya River. Given the small flow in the Polovinnaya River during the winter low water period - only 0.60 m³/s, the treated wastewater will make up over 90% of the minimal flow. Therefore, thermal pollution and changes in ice conditions are likely. In this case, the impact on the aquatic ecosystem of the Polovinnaya River is assessed as high.

The main impacts at the Plant construction phase are related to potential transportation of solids and contaminants with surface runoff, as well as certain construction activities in the water protection zones and shore protective belts, namely construction of the following facilities: the berth on the Lena River for unloading of the large equipment transported by water, and the first lift pumping station at the water abstraction facilities. However, this impact will be limited to the period of construction activities and will have no significant effect on aquatic ecosystems of the Lena River in the long term.

River Lena in the area is prone to significant rises of water levels during high water periods in spring and summer. The maximum rise (934 cm) was registered in 2001. The risk of the Project facilities flooding is reduced to minimum by the design solutions adopted for the Polymer Production Facility. The risk of flooding of the lower operational area of the future plant is discussed in the ESIA Report Section 9.9 - Climate Risks.

10.6. Landscape and Biodiversity Changes in the Proposed Plant Area

No direct impacts on areas having a special protection status are expected because such areas are located at remote distances from the land areas allocated for the Project implementation:

- Land mark "Mir Rock Cliff", 1.5km to the west;
- Prospective land mark "Mineral water spring Turuksky", 20 km to the south;
- Land mark "Ust-Kut Water Spring", 25 km to the west;
- Nature park "Ust-Kut Resort", 25 km to the west;
- Tayursky national natural reserve, 30 km to the south-east.

At the current stage it can be concluded that the proposed plant area does not include habitats which would correspond to the "criticality" criteria used in the Performance Standard 6 of the International Finance Corporation. The Project affected forests are designated as merchantable, i.e. they are available for logging. Apart of that, the forests have been materially modified by human activity and forest fires and do not meet the internationally accepted criteria for "old-growth forests".

However, it is probable that rare and protected species which are registered in the Red Data Books of the Russian Federation and Irkutsk Region may be found in the Project area. This question is subject to further clarification as part of environmental engineering survey; presence of protected species will influence the design solutions which should ensure preservation of existing habitats and provide remediation if necessary.

The main types of impact on natural habitats within the Project area will be:

- Clearing of forest vegetation within the right-of-ways;
- Loss of forest resources;

- Reduction in the resources of useful plant species;
- Loss of individual rare and endangered plants, including those listed in the RF and Irkutsk Oblast Red Data Books;
- Damage inflicted to the vegetation at the boundary of the Project area;
- Stunting of the vegetation by pollution emissions to air;
- Higher risk of fire within the subject area.

Considering the significant area of habitats exposed to irreversible transformation as a result of the Project construction, the overall impact associated with the loss of habitats has been assessed as high. After the land reclamation and forest regeneration measures, the residual impact will be reduced to moderate or low. On the Consultant's opinion, the scale of forest regeneration shall be commensurate with or exceed the area size of occupied spawning protection forest land.

The landscapes that will be exposed to the Project impacts are neither unique nor indigenous and have no conservation status (except for relatively small areas occupied by spawning protection forests) or a special aesthetic function.

The planned changes in the landscape structure of the left bank of the Lena River along its section between the Sukhoy and Gremyachiy creeks will not be limited to construction of the Polymer Production Facility and associated facilities, i.e. numerous linear and areal facilities of the gas trunk pipeline and gas process lines and the LPG Facilities, as well as a Gas Chemical Integrated Facility of a comparable spatial coverage, with a gas fractionation unit, will be developed in the neighbourhood. Some of those facilities will be located within the visibility range of Mostootryad and Yakurim residential areas of Ust-Kut city, being the main cause of the visual impact of the Ust-Kut industrial area of INK and undermining aesthetic value of the affected valley-forest landscape. The planned polymer plant, some facilities of which (including the flare system) will dominate above the forest edge, will be surrounded by a forest strip from 200m to 1300m wide. Since the Company decided to move the PPF process area to a more elevated position compared to the main option considered in 2017, the Plant facilities will be invisible for most receptors - i.e. residents of Ust-Kut city and district.

Fresh water ecosystems of the River Lena and its tributaries make up a special category for assessment of the Project impacts. The assessment should be focused on protected and/or commercial fish species which are vulnerable to water pollution, disturbance of habitats, vibrations, noise and other project impacts. Environmental survey should include detailed examination of aquatic life in the River Lena within the studies area, including fish and their forage resources. The most severe impact on hydrobionts is expected in the course of construction of the berth, the water intake and wastewater discharge facilities on the Lena River. Compliance with the environmental requirements in the process of the project design development and construction phases and prevention of excessive discharge of pollutants to water bodies will reduce the overall impact on freshwater ecosystems from high to low. Waste Management

Waste generation is expected in the course of the Project construction and operation, therefore, suitable schemes should be identified for neutralization, recycling and disposal of wastes. Unless the corresponding measures are implemented, waste management may result in negative impact on human health and the environment - soil, air, ground and surface water.

Waste generated during the Project construction will include waste construction materials, spoil from earthworks, ferrous and non-ferrous scrap, packaging waste, spent batteries, waste oils and solvents, paintwork waste, oily rags, oil-contaminated soil, rubber tyres. Operation of the temporary accommodation compound (TAC) for 7000 persons during the Project construction will generate significant quantities of domestic waste and food waste.

The hazardous waste expected at the Project operation phase include spent reagents, catalysts, adsorbents, and petroleum oil and lubricants (POL). The Project will further generate

other wastes, e.g. waste packaging from supplied raw materials, waste auxiliary materials, sweepings, metal scrap.

All generated waste will be collected with segregation to hazardous or non-hazardous waste, with account for feasible reuse, recycling or disposal. The most hazardous wastes (waste accumulators, POL) will be accumulated on site in dedicated temporary storage facilities specifically designed to prevent potential leaks and pollution of the environment, and transferred to specialized contractors for neutralization and disposal. Waste of lower hazard classes will be transferred for recycling and reuse, or otherwise will be disposed at the IMSW landfill of INK at the Yaraktinsky field.

To minimize the volume of waste disposed at landfills, certain types of waste (coal powder, petroleum-contaminated coke, oily rags, dewatered sludge from the wastewater treatment facilities, etc.) will be treated at the local waste incinerator at the wastewater treatment facilities on the IPP site. Pollution impact on atmospheric air will be reduced by providing the incinerator with an efficient treatment system to remove dust and polluting gases from flue gas. Ash from the thermal treatment process will be disposed at the IMSW landfill of INK at the Yaraktinsky field.

It should be noted that landfilling of waste paper, cardboard and paper packaging, tyres, waste polyethylene and PE packaging, waste glass and glass packaging is prohibited in Russia since 2019. Since 2021 the list of items prohibited for disposal at landfills will be extended to include computers and office appliances, accumulators and household appliances, and electric tools. Therefore, the above fractions will be transferred to specialized contractors for recycling and reuse.

10.7. Positive Socio-economic Impacts in the Project Area

The Project will yield significant and permanent benefits for local communities by providing new employment opportunities for young people and other local groups. More detailed list of the main positive effects of the Project is provided below:

- Increased tax revenues at all levels of public budgets;
- Increased investment attractiveness of Ust-Kut municipality and Irkutsk Region in general;
- Opportunity to develop gas distribution network in Ust-Kut city;
- Immigration of young professionals and provision of favorable conditions for development and retention of local young specialists;
- Increased standard of living with better incomes;
- Improved living standards of local communities including vulnerable groups;
- Indirect positive impact of the Project on development of educational programmes in Ust-Kut district;
- Stimuli for development of local small and medium businesses, both direct (contracting of local companies) and indirect (provision of new and expansion of existing product sales markets due to attraction of workforce);
- Increased employment and hence reduction of unemployment rate among local residents;
- Increased turnover of local suppliers and distributing companies.

One of the important benefits of the Project is its positive impact on employment of local residents in the oil and gas sector which is the most important sector of the district economy. At present 74% of INK employees are residents of Ust-Kut city or district. The Company can influence the level of employment in local communities either directly (by employing local residents) or through its contractors involved in the Gas Business Development Programme.

10.8. Negative Socio-economic Impacts in the Project Area

The negative Project impacts which are listed below are considered by Ramboll as theoretically possible and thus subject to further detailed assessment and forecasting, and Irkutsk Oil Company should develop adequate prevention, mitigation, monitoring and remediation measures to address them.

1. Increased health risks to communities and personnel of companies engaged in the Project.

Health impacts in Ust-Kut city and district may be caused by pollution emissions at the Project construction and operation phases, as well as contacts between local communities and Project personnel (mainly at the construction phase). This refers primarily to increased repeatability of respiratory diseases. From this perspective the most vulnerable groups are residents of Mostootryad and Yakurim areas of Ust-Kut, as well as owners and users of plots in SOT Kedr-2 intended for recreation and subsidiary farming (the majority of land plots are abandoned, without any development activities). Residents of REB and YGU areas may be also exposed to impact, depending on the final location that will be selected for construction of the Company personnel accommodation facilities for the construction phase.

Irkutsk Oil Company takes measures to reduce the above health risks to public and personnel. In particular the Project provides for the necessary protective mechanisms to prevent excessive impacts of the plant and associated development on atmospheric air quality (probability of such impact per se is assessed as low). In addition, Ramboll recommends that specific rules would be developed and implemented by INK to regulate behaviour of personnel of all companies involved in the Project, including their activities outside work hours. Also, INK will provide adequate accommodation facilities in the temporary compounds, including domestic appliances and leisure infrastructure.

Irkutsk Oil Company is implementing its own programmes in the sphere of healthcare, medical services and insurance which cover all members of personnel. Medical stations will be provided at the construction sites and after commissioning - within the structure of the company established to run the operations. The most favourable conditions will be created for professional and leisure activities of companies engaged for the Project.

The obvious factors which will affect well-being of residents of Ust-Kut city and their perception of INK activities also include their relations with shift personnel of contractors in general (mainly at the construction phase), level of management of construction and operation activities, as well as construction and operation impacts which are minor in magnitude but still tangible and difficult to remove, e.g. odour and noise emissions (within the applicable hygienic limits), and visual effects. Assessment of such impacts takes into account the efforts applied by INK to harmonize mutual relations between the Company and local communities, including various forms of support for municipalities, non-government organizations, municipal institutions and residents of Ust-Kut city and district. Further enhancement of such activities will ease overall social tensions and must be supported by strict control of contractors' activities, reinforcement of culture of construction (it is well known this aspect is problematic in all regions of Russia), unbiased and constructive approach of the Company to grievances and claims of local communities and non-government organizations.

2. Complication of community safety situation

Transportation activities and emergency situations during construction and operation of the Polymer Plant may affect safety of local communities. The above factors may provoke more intensive traffic and affect safety of pedestrian crossing of public roads used by the Project. It should be noted that increased traffic may affect vulnerable groups in Ust-Kut, e.g. low-mobility groups and children. It is expected that this impact can be mitigated by a system of measures (enforcement of traffic regulations, planning with due account for routes used by local communities, support of development of safe environment for pedestrian traffic, etc.).

Presence of Project security personnel may impact safety of communities in Ust-Kut city and district in case of conflict situations. Personnel of security contractors may apply force and non-lethal weapons in certain situations (e.g. unauthorized access to the Project territory). It should be noted that the Project security contractor holds a licence issued by the Irkutsk Region Department of Russian Ministry of Interior, and his activities are regulated by legal acts and regulations of the Russian Federation. According to the available information, all previous offences were stopped by security personnel without use of non-lethal weapons. Thus it can be concluded that no serious conflicts involving Project security personnel have happened at the sites of INK facilities.

3. Impact of municipal infrastructure of Ust-Kut city and district

Immigration flow of Project workforce at the construction phase may increase load on social infrastructure in Ust-Kut. The load on local healthcare institutions may grow as a result of diseases of Project personnel, road accidents or other unforeseen situations.

Probability of this impact at the construction phase can be significantly reduced by a number of factors. Firstly, experience of analysis of INK operations in Ust-Kut district demonstrates that the Company facilities are adequately equipped to ensure safety of living and working activities, and the sites are regularly inspected for compliance with sanitary regulations. Such facilities include mobile accommodation, canteen, medical post, qualified medical personnel and gyms. Regular health and safety trainings which are provided by the Company help to reduce the rate of occupational injuries.

At the operation phase, it is also probable that the load on local education infrastructure (schools and kindergartens) will increase, if personnel of the Polymer Plant will move to Ust-Kut with their families. This issue must be further studied in the future. However, the above impact will be minimised by construction of the INK residential area which is expected to include all required social infrastructure.

Project implementation may also potentially affect transport system of Ust-Kut city (including condition of road pavement) and municipal water networks, e.g. due to transportation of goods to the construction sites, products transportation at the operational phase, transportation of personnel, etc. ESIA studies takes into account poor state of road network in the city which was noted by local stakeholders. In view of the above, Ramboll recommends to Irkutsk Oil Company to pay special attention to development of transport scheme for the future Project, assessment of current and future state of the part of the street and road network which will be used by the Project, optimization of transport and construction machinery traffic, compensatory repair of damaged roads and bridges, high standards of maintenance and repair of the used vehicles, high quality training of drivers and maintenance personnel.

4. Employment related impacts

Potential negative impacts in the sphere of employment relations are possible in case of failure to respect employees' rights and potential conflicts between members of Project personnel. The studies identified that probability of the Company's failure to respect the rights of employees is low. By now INK has implemented a system of internal regulations which are intended to prevent potential conflicts between employees and the Company. It can be concluded that INK applies efforts to ensure safe and healthy working environment, salaries are paid in a timely manner, upgrading opportunities are provided through a system of professional trainings, the Company guarantees medical insurance and arranges recreational activities for its employees. Personnel grievance mechanism is implemented.

Negative impacts in the sphere of employment relations may be caused by activities of contractors and subcontractors. The Company applies efforts to control its contractors, e.g. INK implemented internal regulation which defines client's requirements in the sphere of health, safety and environment. As a result of the Company's efforts to control contractors' activities, the impact (if any) will be local, short-term and minor.

5. Changes in population gender and age structure

The Project will attract significant number of workforce (about 7000) at the construction phase, mainly men within the age range of 18 to 40-50 years. However male construction workforce will be brought to the Project area on a temporary basis, for about three years. It is expected that in 2019-2021 population number in Ust-Kut city and Ust-Kut district will increase, and the age group between 18 and 40-50 years will increase in number. Emigration flow of people at the age under 34 years from Ust-Kut city and district may decrease.

The impact assessment takes into account the workforce demobilization measures to be taken by INK at the end of construction phase, which will help to minimize the negative effect of immigration.

Ramboll recommends a number of mitigation measures which would control behaviour of the Project personnel, management of the rotation-shift accommodation camp, reasonable use of all kinds of resource and provision of adequate training aiming to ensure respectful communication with local communities. With the proposed measures implemented, the residual impact will be minor.

6. Impact on hunting and fishing

The impact may be caused primarily by the influx of workforce in to the Project area and Ust-Kut city at the construction phase, which may increase the load on natural resource. In particular, it is possible that some hunters and fishers will be present among the migrant workers (mainly male), which may increase the load on surface and water fauna and disturb the current practice of using forest and water resource by local communities. However, it should be noted that not commercial hunting areas are present near the Project sites.

Hobby angling and hunting activities may be affected by noise and light impacts of the Project construction site.

The recommended mitigation measures include regular consultations with local branch of the regional public organization of hunters and fishers of Irkutsk Region, implementation of code of conduct of the Project personnel in order to prevent poaching and fishing/hunting by the Project personnel without licenses for such activities. Keeping of companion animals at the construction and operation site of the Polymer Plant should be prohibited. The above measures will help to minimize the impact.

7. Occupational health and safety (H&S)

Experience of similar projects in Russia and other countries indicates that the activities planned by Irkutsk Oil Company are commonly accompanied by increased rates of occupational injuries, diseases and road accidents. Assessment of the impact takes into account the existing system of internal corporate regulations which are applicable to all INK employees and provide inter alia for maintaining the level of competence in the sphere of health and safety and provision of additional training as required. The Company has strong institutional capacity to manage H&S issues and regularly monitors key performance indicators in this sphere. Thus the above potential risks are mainly related to activities of contractors and subcontractors. It should be noted that the Company strictly monitors its contractors on the basis of specific corporate regulations. The contractors management activities of INK significantly reduce probability of materialization of H&S risks. The impact is assessed as minor, provided that mitigation measures will be implemented including further monitoring of contractors H&S performance, adequate management of workforce accommodation facilities at the construction, assessment of risks associated with specific operations, etc.

8. Impacts on cultural and historical heritage

In relation to design development activities within the scope of the Gas Business Development Project for construction of facilities at the adjacent sites (LPG Facilities, etc.), Irkutsk Oil Company initiated archaeological survey within the designed site and in the adjacent territories

including the land plot considered for construction of the polymer plant. The study did not identify any heritage sites or other artefacts.

On the other hand chance finds of artefacts during construction activities is not totally impossible. Thus Ramboll recommends development and implementation of a Chance Finds Procedure to be applied during any site preparation and excavation activities. The procedure should provide a clear algorithm in case of chance finds, including suspension of works, provision of barrier screen around the respective part of construction site, restriction of unauthorized access to the place where the object was found, and notification of competent authorities. This procedure will minimize probability and magnitude of potential negative impact.

11. MAIN FORMS OF PROJECT MANAGEMENT

11.1. Environmental, Health and Safety Management at the Project Level

Existing procedures at the corporate level of INK ensure adequate control of environmental, social, health and safety impacts and risks. However, project specific management and monitoring procedures should take into account both special features of the area identified by the PreESIA, and the current construction and business practices.

The Project will be implemented by special purpose subsidiary of INK – Irkutsk Polymer Plant, limited liability company. The corporate system procedures for environmental protection (EP), health and safety (H&S) will be applied within the whole Project.

Project contractors activities will be managed in line with the INK Standard “Environmental, health and safety requirements (HSE) of the Client” CT.04.10 rev. 6, which has been developed in accordance with ISO 14001 and OHSAS 18001.

The Company plans to coordinate and monitor all stages of the Project life cycle – from design to decommissioning. Specific tools will be used at each stage to prevent, minimize, mitigate potential negative impacts, as well as measures to enhance potential benefits, including:

- Preliminary and full-scale assessment of environmental and social impacts of the Project in compliance with international requirements, including incorporation of stakeholders’ opinions identified as a result of public discussions;
- Preparation of design specifications in accordance with the best international practice in the industry, and internal review of the design solutions;
- Selection of qualified contractors who are capable of performing the Project requirements, and monitoring contractors’ performance according to the requirements throughout the contracts;
- Procurement of modern equipment and materials that comply with the up-to-date environmental and safety standards;
- Current management and control of the site construction activities, performance of the works using modern technologies;
- Arrangement of environmental, social, H&S training for the Company’s and contractors’ personnel;
- Current and long-term management of impacts and risks for the environment, occupational safety, health and safety of personnel and public, within the scope of the Company’s IMS.

INK does not intend to include IZP and the PPF into the certified Integrated Management System, however the System procedures for environmental protection, health and safety (EHS) and social management, monitoring and control will be applied to IZP and hence to all parties involved in the Project implementation.

In order to ensure performance of the applicable requirements and duties assumed by the Project parties during the course of its implementation, IZP will develop and implement specific

documents with measures and actions aiming to improve environmental and social performance and reduce potential environmental and social risks and impacts identified by the ESIA process. The documents will be integrated into the Company's management system and will include procedures, rules and plans intended to provide systematic and comprehensive management of all environmental and social aspects of the Project. The above program documents shall be applied to the whole range of the Project activities performed by INK and by subcontractors under INK supervision.

In particular INK is developing the documents which will become the main management and monitoring documents at the construction stage:

- Environmental and Social Management Plan;
- Environmental and Social Action Plan.

At the construction phase EP and H&S issues will be managed via the Client Service, including application of all requirements to contractors that are mentioned above.

At the operation phase Irkutsk Polymer Plant LLC will have its own environmental and OHS services: Chief Ecologist's Service, and Deputy Chief Engineer's Service. It is further anticipated that personnel preparation and training processes will be introduced. The above services will be subordinated to the Technical Director – Chief Engineer.

11.2. Environmental and Social Management Plan (ESMP)

ESMP is a framework document that describes the environmental and social management and monitoring procedures. The document is supplemented as required by a set of environmental and social management plans and procedures for specific activities which are of importance for the Project and require special attention. ESMP will establish environmental and social requirements to the Project, and the methods and ways to ensure compliance with the requirements at the Project development and implementation. In particular, ESMP will describe the following:

- Environmental and social management organization approach, including definition and allocation of functions and responsibility;
- Applicable environmental and social standards;
- Specific activities to be performed in the sphere of management, mitigation and monitoring of environmental and social impacts.

In view of the dynamic nature of the Project development, the environmental and social management plan(s) will provide for operative response to the changing situation, unforeseen events, and results of monitoring and analysis of the Project activities.

In view of the natural, technical and socio-economic baseline of the project area which is described in sections above, the potential environmental and social impacts, as well as proposed prevention and mitigation measures, the following management plans and procedures must be developed for the Project (without limitation):

- Project specific Stakeholder Engagement Plan including comprehensive measures for provision of adequate information for local communities and stakeholders about INK projects in Ust-Kut District, a programme of various consultations, provision of personnel and public grievance mechanism;
- Updated Stakeholder Engagement Plan at the INK level;
- Environmental and Social Management and Monitoring Plan for the construction phase (for the main construction contractors, providing "umbrella" coverage for subcontractors);
- Waste Management Plan for the construction and operation phases;
- Land Mass Management Plan (including dust control and bank protection);
- Transport Traffic Management Plan;

- Workforce Temporary Accommodation Management Plan for the construction phase;
- Workforce and Working Conditions Management Plan;
- Personnel Code of Conduct for the construction sites (also applicable to contractors)
- Policy for counteraction to all forms of discrimination at work;
- Chance Finds Procedure for the construction phase.

11.3. Environmental and Social Action Plan (ESAP)

Pursuant to the Project management approach developed within the scope of the ESIA and described in this Chapter, and aiming to ensure compliance with the applicable requirements of the international financial institutions at all stages of the Project life cycle, the Company will prepare an Environmental and Social Action Plan (ESAP) and get it approved by the Lenders. ESAP development is intended to identify the key target actions and respective performance criteria, and to designate responsibility for successful management of the most sensitive environmental and social aspects of the Project. The Plan is an integral part of the Loan Agreement.

12. GENERAL CONCLUSIONS OF ESIA

The assessment of environmental and social impacts (ESIA) of construction and operation of the proposed Polymer Production Facility provided herein is intended to update and refine the PreESIA studies of 2017 considering the new solutions under the Gas Business Development Programme of the Irkutsk Oil Company (INK), adopted general engineering decisions, information on the land allocated for the Project sites, and other materials available by present time. Some of the ESIA conclusions are preliminary and may be revised in more detail considering the results of the environmental survey and the design documentation.

The main results of ESIA have been grouped by objects (receptors) and type of impacts, and tentative assessment of scale, significance and risk of the negative consequences has been prepared.

According to the available materials, Irkutsk Oil Company has selected the site located about 4 km to the north of the Ust-Kut site as the basic site location for the Polymer Production Facility and associated facilities. Disadvantages of this scenario include the remote location of the site in relation to the associated facilities, as well as the technical and environmental risks related to vicinity of a major source of air pollution – the wood processing waste dump that have been burning for multiple years. However, the key advantage of the selected option is its location in merchantable forest land. Therefore, the sensitive ecosystems of spawning protection forests are no more considered for construction of the Project facilities and impact on them will be avoided.

The Project is a part of the INK Gas Business Development Programme which is focused to gradually enhance utilization of gaseous components of the produced hydrocarbon mixtures using the existing or new gas processing and transport facilities of INK - the gas transportation system, LPG reception, storage and offloading terminal, gas processing plant. The Polymer Production Facility will utilize the benefits offered by the unique composition of the produced gas (including associated petroleum gas) for production of marketable products. The wasteful and environmentally unfriendly practice of flaring will completely cease; therefore, the negative environmental impacts will be reduced. At this background cancellation of the Project would not yield any environmental or social benefits for the district, as the main causes of the existing problems are beyond the scope of activities of the Irkutsk Oil Company.

The main negative environmental effect of the Project is condemnation of a part of modified forest land habitats (merchantable forests), along with fragmentation of the natural habitats in the designated spawning protection forests by communication corridors. Estimated total area allocated for the PPF facilities is 584 ha (100%) including 134.0 ha (23 %) for the process

areas, 358 ha (61 %) for the linear facilities, and 92 ha (16 %) for temporary facilities at the construction phase.

Significance of other anticipated impacts on the environment, e.g. pollution emissions to air, water abstraction from the Lena River and discharge of treated wastewater, as well as disposal of wastes, will be incomparably lower. Such impacts will not result in development of any pronounced deterioration trends in the quality of air, water, biological and subsoil resources.

The Project implementation the region that badly needs socio-economic development will produce a range of economic and social benefits. The Project will yield significant and permanent benefits for local communities in terms of new employment opportunities for young people and other local groups, attraction of new workforce, sales opportunities for local businesses through the Project procurement system, as well as guarantees within the scope of corporate social responsibility.

The main social risks are related to the construction phase when up to 7000 workers will be engaged for the Project. The main negative effects include:

- Increased load on the road infrastructure in the city and district due to the Project vehicles traffic (deterioration of road pavement, traffic restrictions on public roads, etc.), and respective risks of traffic accidents;
- Conflicts between the Project labour migrants and local communities are possible in relation to the Project implementation. A set of measures has been identified to minimize this impact of moderate significance.

The impacts' significance is assessed as high for the construction and moderate for the Project operation phase. Mitigation measures have been proposed to minimise it.

Potential negative impacts may also be caused by violations in the sphere of labour relations and working conditions for the Project personnel. Those include disregard of labour rights and occupational health and safety regulations, provision of temporary accommodation that fails to meet the applicable Russian and international requirements. Such impacts and risks are most attributable to the engaged contractors and subcontractors. Significance of the potential impact is assessed as moderate, however, mitigation measures have been proposed to further reduce it.

The Project will affect local land users - hunters using the Project area and nearby territories. Two hunters produce fur animals in the area, and other 20-50 hunters produce upland game and water fowl. The impact is assessed as moderate in significance. Mitigation measures have been proposed by the ESIA to minimise it.

Ramboll believe that the Project can be implemented on the conditions of prevention, minimization and compensation of any negative environmental impacts.