AMUR GAS PROCESSING PLANT ENVIRONMENTAL AND SOCIAL SCOPING REPORT

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3				

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GLOSSARY OF ABBREVIATIONS

AGPP	Amur Gas Processing Plant
AIIB	Asian Infrastructure Development Bank
AO	'Акционерное общество' (Joint Stock Company)
CH_4	Methane
CNPC	China National Petroleum Corporation
CO	Carbon monoxide
CO_2	Carbon dioxide
DD	Detailed Design
EBRD	European Bank for Reconstruction and Development
ECA	Export Credit Agency
EGP	Eastern Gas Programme
EHS	Environmental, Health and Safety
EMS	Environmental Management System
EBRD	The European Bank for Reconstruction and Development
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
GAU	State Autonomous Agency ('Государственное автономное учреждение')
GHG	Greenhouse Gases
GKU	State-owned Agency ('Государственное казённое учреждение')
GPPB	OOO Gazprom Pererabotka Blagoveshchensk
GPP	Gas processing plant
FAU	Federal Autonomous Agency ('Федеральное автономное учреждение')
FEED	Front-end engineering design
IFC	International Finance Corporation
IPIECA	International Petroleum Industry Environment Association
MP	Management Plans
MPC	Maximum Permissible Concentration
NIPIGAZ	AO NIPIGazpererabotka
NO_2	Nitrogen dioxide

NO_x	Oxides of nitrogen
NTS	Non-Technical Summary
OECD	Organisation for Economic Cooperation and Development
OOO	‘Общество с ограниченной ответственностью’ (Limited Liability Company)
OVOS	‘Оценка Воздействия на Окружающую Среду’ (an Environmental Impact Assessment in the Russian regulatory practice/statutory permitting)
PAO	‘Публичное акционерное общество’ (Public Joint Stock Company)
PD	Project Design
PM	Particulate Matter
RF	Russian Federation
RZD	OAO RZD, Russian Railways
SEP	Stakeholder Engagement Plan
SO_2	Sulphur dioxide
SPZ	Sanitary Protection Zone
SSM	SvyazStroyMontazh
TSF	Temporary support facilities
VOC	Volatile Organic Compounds
WFLH	Wide fraction of the light hydrocarbons

1 INTRODUCTION

1.1 INTRODUCTION TO AMUR GPP PROJECT

The Amur Gas Processing Plant (GPP) will be built in the Far Eastern Federal District of Russia, Svobodnensky District of the Amurskaya Oblast (Figure 1.1). It will be the largest in Russia and one of the world's largest gas processing plants. The design capacity of the plant will reach up to 42 billion cubic meters of gas a year. The plant commissioning begins in 2021.

Figure 1.1 Location of the Amur GPP Project[1]

The Amur GPP is needed for processing of multi-component natural gas transported over the *Power of Siberia* gas transmission system from the Yakutsk and Irkutsk gas production hubs, created by PAO Gazprom within the framework of realisation of the Eastern Gas Programme (EGP). This Scoping Report focuses on the Amur GPP only and does not include assessment of the upstream gas fields or Power of Siberia pipeline system.

[1] http://www.gazprom.com/press/news/2016/april/article271729/

The gases produced at the Amur GPP will be commercial gas, methane, ethane, propane, butane, and pentane-hexane fraction, and helium. The Amur plant's 1.875 million-tonne/year production of ethane will be utilised by PAO SIBUR Holding to produce polyethylene at their nearby deep hydrocarbon conversion plant. The purified methane will be exported to China. The Amur GPP will also be the world's largest helium production facility with capacity up to 60 million cubic meters of helium a year.

Gazprom Pererabotka LLC and Gazprom Gazoraspredelenie LLC established OOO Gazprom Pererabotka Blagoveshchensk (GPPB) as a special-purpose company dedicated to implement the Amur Gas Plant Project. GPPB and AO NIPIGazpererabotka (NIPIGAZ, a part of SIBUR Group) concluded EPC contract on designing, coordinating equipment and material supplies as well as managing the construction of the Amur GPP. NIPIGAZ is acting as a general contractor responsible for the Project development.

1.2 INTRODUCTION TO THE SCOPING REPORT

This report represents the 'Scoping Report' for the Project and has been prepared as part of the Project's Environmental and Social Impact Assessment (ESIA) process. The ESIA, including this Scoping Report, is being developed in addition to the OVOS (environmental assessment) materials developed as part of the RF planning process, and is specifically developed to demonstrate compliance with international Lender requirements. In particular, the Scoping Report has been developed in line with good international industry practice including the EU guidance on scoping[2].

Scoping is the process of determining the content and extent of the matters that should be covered in the ESIA and associated documentation. It should be noted that the scoping report is not intended to provide detailed information regarding the Project. Instead, it is a preliminary overview of the Project intended to form the basis for early engagement with relevant stakeholders and to help identify potential Project impacts. Scoping is designed to ensure that ESIA is focusing on the most important impacts, project alternatives, and any other significant issues.

This report is structured in a manner that addresses the scoping requirements as follows:

Chapter 2 describes the approach taken to the ESIA scoping process.

Chapter 3 outlines the approach to stakeholder engagement.

Chapter 4 provides a description of Project alternatives.

Chapter 5 includes a brief description of the Project.

Chapter 6 provides a description of the environmental and social baseline conditions of the Project area.

Chapter 7 describes the Project's potential environmental and social impacts and outlines the approach to assessment and mitigation of such impacts in the ESIA.

[2] http://ec.europa.eu/environment/archives/eia/eia-guidelines/g-scoping-full-text.pdf

Chapter 8 outlines the work plan and timeframes for the entire ESIA process.

1.3 SOURCES OF INFORMATION

The following information sources provided by GPPB have been used to prepare this Scoping Report:

- results of geological, environmental and meteorological surveys;
- results of works on identification and assessment of historical ground contamination extent and characteristics;
- results of operational environmental monitoring;
- results of previous ESIAs carried out on behalf of GPPB, and materials of the Design documentation;
- results of the IFC Compliance Audit of the Project performed by Ramboll Environ in 2016;
- project design documentation, technical data on scheduled activities, production conditions, equipment specification, general layout plans, materials on construction management.

Other information sources, such as published literature and official statistics, have been consulted and these are referenced where relevant. During the further ESIA process Ramboll Environ will stay in close cooperation with GPPB for provision of any required data.

2 APPROACH TO PROJECT ESIA SCOPING

2.1 OVERVIEW

Scoping is the process of determining the content and extent of the matters that should be covered in the ESIA and associated documentation. The scoping process aims to identify the types of environmental and social impacts (both adverse and beneficial) to be investigated and reported in the ESIA, and to identify those aspects that are potentially of greatest significance. Further detail will be provided within a suite of additional documents that will be developed during the course of the full ESIA process.

The scoping process also covers:

- Identification of applicable legislation, policy, and Project standards.
- Project alternatives that have been considered.
- Baseline surveys and investigations that should be carried out to supplement those conducted for the OVOS process.
- Methods and criteria to be used for prediction and evaluation of effects.
- Mitigation measures which should be considered.
- Organisations to be consulted during the environmental studies.
- Definition of the boundaries of the Project assets, facilities, activities and Area of Influence that are to be considered in the ESIA.
- The structure and content of the ESIA.

It is important to note that although scoping can be considered as a discrete ESIA stage, the activity of scoping should continue throughout the ESIA process, so that the scope of work can be amended in the light of new issues and new information.

2.2 IDENTIFICATION OF APPLICABLE LEGISLATION, POLICY AND PROJECT STANDARDS

GPPB is seeking to procure project financing for the Amur GPP Project. The required funding is expected to be raised from Export Credit Agencies (“ECAs”), commercial banks (“Banks”), capital markets (including bond underwriters and bond investors), and other prospective lending institutions (collectively, the “Lenders”). In line with this financing strategy, the Project is being developed in compliance with the following environmental and social requirements:

- Russian law, codes and standards.
- All applicable international laws and conventions to which the Russian Federation is a signatory and which have been ratified into law in the Russian Federation.
- Applicable international Lender requirements, including:

- The Equator Principles (2013)[3].
- The Organisation for Economic Cooperation and Development (OECD) Common Approaches (2016)[4].
- The World Bank/IFC Environmental, Health and Safety Guidelines (2007) including the General EHS guidelines and applicable Industry Sector Guidelines[5].
- The IFC Performance Standards (2012)[6].
- The EBRD Performance Requirements as defined in the EBRD Environmental and Social Policy (2014)[7].
- Environmental and Social Standards of Asian Infrastructure Investment Bank (AIIB) (February 2016)

The Project performance will therefore be assessed against the standards provided within the above national and international environmental and social requirements. Should national regulations and/or international conventions differ from the levels and measures presented in the applicable Lender standards, the Amur GPP Project will apply the most stringent standard except where there is a strong justification to deviate from the most stringent standard.

2.3 METHODOLOGY FOR IDENTIFICATION OF POTENTIAL IMPACTS

The primary methods for identification of potential environmental and social impacts are through:

- **Review of existing Project assessments and information.**

  In the case of the Amur GPP Project, OVOS materials are being developed as part of the Russian planning approval process. These documents provide information on existing baseline data, impact assessments and mitigation measures. As such, the OVOS materials provide valuable input data to the development of the ESIA, including the scoping process. At the time of writing the Scoping Report, design documentation materials have been submitted to the Russian authorities for “Expertisa” review (this is a formal expert review under the Russian planning approval process) for the following proposed Project Stages:
  - Stage 1. Early works;
  - Stage 2. Railway infrastructure;
  - Stage 3. Project infrastructure and auxiliary facilities;
  - Stage 4. Gas processing plant;
  - Stage 5. Housing estate;
  - Stage 6. Solid waste landfill.

[3] http://www.equator-principles.com/index.php/ep3/ep3
[4] http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/ECG%282016%293&doclanguage=en
[5] Currently under revision: http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehs_guidelines_technical_revision
[6] http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Document.pdf?MOD=AJPERES
[7] http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/performance-requirements.html%20

The OVOS within the project design documentation has been developed by the Technological Engineering Holding Peton (Peton). The following set of environmental volumes within the project design documentation apart of OVOS has been also delivered by Peton:

- Design of the construction right-of-way;
- Section “Identification of the Environmental Aspects” (separately for the construction and operations periods);
- Design project for the norms of permissible waste generation and obtaining limits on waste disposal (separately for the construction and operations periods);
- Design project for the norms of the maximum permissible emissions of air pollutants (separately for the construction and operations periods);
- Design project for the norms of the maximum permissible discharges of water pollutants (separately for the construction and operations periods);
- Design project for substantiation of the sanitary protection zones;
- Design project of industrial environmental control (monitoring);
- Design project for the domestic and industrial wastes landfill.

- **Stakeholder Engagement.**

  Amur GPP will develop a Stakeholder Engagement Plan (SEP) for the Project as a part of the ESIA process in order to direct its engagement with relevant stakeholders, including potentially affected communities. A key objective of the engagement processes defined in the SEP is to identify stakeholder concerns and issues, and to ensure that these are appropriately and demonstrably addressed in the ESIA. The future engagement activities will build on the consultations already undertaken as part of the OVOS processes, and include routine engagement and a means to redress grievances. Further details on the stakeholder engagement process are provided in Chapter 3.

- ‘**Source-Pathway-Receptor’ Analysis.**

  Identification of potentially significant environmental and social impacts is also undertaken through a structured consideration of the potential sources of impact, the pathways through which impacts may affect the environment and humans (e.g. transport of emissions/ discharges through the environment) and the nature of receptors (e.g. humans, flora and fauna etc.) that may be impacted. In doing so, consideration is given to both:

  - The characteristics of the Project and associated activities that may impact on the environment and society (i.e. the ‘sources’ of impact). The sources of impact are identified systematically through consideration of:
    - Each of the different phases of the Project, namely Construction, Commissioning, Operations and Decommissioning.
    - The relevant different environmental and social aspects/topics.
  - The characteristics of the environmental and social baseline or other conditions that could be susceptible to significant adverse effects (the ‘receptors’ of impact).

In order to identify those aspects that may lead be to potentially significant impacts, consideration is given to:

1. Will there be a large change in environmental or socio-economic conditions?
2. Will new features/structures be out-of-scale with the existing environment?

3. Will the impact be unusual in the area or particularly complex?
4. Will the impact extend over a large area?
5. Will there be any potential for transboundary impact?
6. Will many people be impacted?
7. Will many receptors of other types (fauna and flora, businesses, facilities) be impacted?
8. Will valuable or scarce features or resources be impacted?
9. Is there a risk that applicable environmental standards will be breached?
10. Is there a risk that protected sites, areas, or features will be impacted?
11. Is there a high probability of the impact on environmental or socio-economic conditions occurring?
12. Will the impact continue for a long time?
13. Will the impact be permanent rather than temporary?
14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the impact?

The ESIA will use an impact assessment methodology that considers the above variables for each potential impact in turn taking likelihood and severity of impact into account. Where impacts are identified, mitigation measures will be developed based on the mitigation hierarchy, which comprises avoidance, minimisation, restoration and finally offset of impacts in that order of priority.

3 STAKEHOLDER ENGAGEMENT

3.1 BACKGROUND

Engagement with stakeholders is of key importance in ensuring that potential adverse impacts are identified and managed, and that benefits to the community stemming from the Project are enhanced. Initiating the engagement process in the early phase of the Project helps ensure timely public access to all relevant information and gives stakeholders an opportunity to input into the Project design, the identification and assessment of impacts and mitigation/enhancement measures. To best facilitate this process, the Project will develop a Stakeholder Engagement Plan (SEP) during the ESIA process which will be updated periodically throughout the life of the Project. The SEP describes:

- The identification of key stakeholders.
- The consultation activities that have been undertaken to date.
- Planned future stakeholder engagement processes through the Project lifecycle.

A brief summary of each of the above aspects is provided below.

3.2 IDENTIFICATION OF KEY STAKEHOLDERS

For the purposes of effective and tailored engagement, the following stakeholder categories have been identified:

- Affected Parties – persons, groups and other entities within the Project Area of Influence (see Section 5.10) that are directly affected (actually or potentially) by the Project and/or have been identified as most susceptible to change associated with the Project. They should be closely engaged in the identification of impacts and their significance, as well as in decision-making on mitigation and management measures;
- Other Interested Parties – individuals/groups/entities that may not experience direct impacts from the Project but who consider or perceive their interests as being affected by the Project and/or who could influence the Project and the process of its implementation in some way; and
- Vulnerable Groups – persons who may be disproportionately impacted or further disadvantaged by the Project relative to other groups due to their vulnerable status, and that may require special engagement efforts to ensure their equal representation in the consultation and decision-making process associated with the Project.

A comprehensive list of stakeholders at the local, regional, federal and international levels has been identified in the SEP.

3.3 CONSULTATION ACTIVITIES UNDERTAKEN TO DATE

To date, consultation in the form of statutory public hearings has been used as the primary method of involving the communities residing in the areas potentially impacted by the Project. The primary purpose of the public hearings has been to maintain regular and frequent dialogue with the communities, keep them informed about the Project developments, planned activities and the

associated potential impacts, and provide opportunities to give input during the development of mitigation measures.

The following main consultation activities have been undertaken by the Amur GPP Project to date are summarised in Table 3-1.

3.4 CURRENT AND FUTURE ENGAGEMENT ACTIVITIES

Future and ongoing stakeholder engagement activities will include the disclosure process associated with the release of the Project ESIA. This will comprise:

- Disclosure of the SEP and Scoping Report. The SEP and this Scoping Report are to be placed in the public domain. Consultation meetings will be held in Project affected communities and with other stakeholders in which the contents of the SEP and Scoping Report will be presented for discussion, thereby helping to ensure that stakeholders' views are taken into account in the development of the ESIA.
- Disclosure of the ESIA package. The ESIA materials (including a Non-Technical Summary (NTS), a final draft of the main Environmental and Social Impact Assessment report, Environmental & Social Action Plan (ESAP) and Environmental & Social Management Plans (ESMP)) will be placed in public domain. Disclosure of the ESIA package of materials will involve:
  - An anticipated 60-day disclosure period (the precise duration of the required disclosure period will depend on this specific requirements of individual Lenders); and
  - Public consultation meetings within the disclosure period. Meetings will be held with Project affected communities and with other stakeholders to present and discuss findings of the ESIA and measures proposed in the ESAP and ESMP.

Following the end of the disclosure period and receipt of all comments, the ESIA materials will be revised and the finalised ESIA materials disclosed.

In addition to the disclosure of the ESIA and the SEP, the Project will continue to regularly engage with its stakeholders throughout the Project lifespan. A summary of the future stakeholder engagement and disclosure methods is provided in Table 3-2 below. The SEP will remain in the public domain for the entire period of Project life and will be updated on a regular basis as the Project progresses through its various phases in order to ensure timely identification of any new stakeholders and interested parties, and their involvement in the process of collaboration with the Project. The methods of engagement will also be revised periodically to maintain their effectiveness and relevance to the Project's evolving status.

Table 3-1 Summary of Key Concerns and Suggestions Raised in Previous Stakeholder Engagement Activities

Date	Nature of engagement	Location of engagement	Key concerns and suggestions raised
30 April – 30 May, 2015	Public hearing of the Technical assignment for preparation of OVOS for Amur GPP (in a form of survey). Information about the OVOS procedure and the Technical assignment was published in the local and federal press.	• Svobodny District Administration office / webpage www.svobregion.ru; • Nizhnebuzulinsky District Administration office; • Dmitrievsky District Administration office; • VNIPI Gazdobycha, www. vnipigaz.gazprom.ru'.	No concerns have been expressed during the consultation period.
23-09-2015	Public hearing on a preliminary revision of AGPP Project EIA carried out by VNIPI Gazdobycha jointly with the Svobodnensky District Administration.	Tchernigovka village	Questions have been raised: • Construction schedule • Freshwater pollution prevention • Employment of the local population at the Project Conclusions: The public supported the Project development taking into consideration satisfactory answers to the discussed questions.
23-09-2015	Public hearing on a waste disposal facility project	Tchernigovka village	Head of Svobodnensky District Administration suggested that the waste disposal facility designed for the Project should be available for the domestic waste disposal by the local population. The Project representatives promised to consider this option. Conclusions: The public supported the Project development taking into consideration satisfactory answers to the discussed question.
11-05-2016	Public hearing of a housing estate design project in the Northern part of Svobodny for AGPP staff.	Svobodny	Questions have been raised: • Who would be responsible for exploitation of this housing estate? GPPB representative answered that this housing estate will be handed over to the Svobodnensky District Administration upon its commissioning. • Local population would like to have opportunity selling/ buying the local gardening products in a kiosk within this accommodation area. Conclusions: The public supported the Project development taking into consideration satisfactory answers to the discussed questions.

Table 3-2 Stakeholder Engagement and Disclosure Methods

Stakeholder Group	Project Information Shared	Means of communication/ disclosure
Local population in the Project Area of Influence	• SEP and Scoping Report • ESIA package (ESIA, ESAP, ESMP), Non-Technical Summary of the ESIA, and Stakeholder Engagement Plan • Public Grievance Procedure[8] • Regular updates on Project development	• Public notices • Electronic publications and press releases on the Amur GPP Project website • Dissemination of hard copies at designated public locations • Press releases in the local media • Consultation meetings • Information leaflets and brochures • Separate focus group meetings with vulnerable groups, as appropriate.
Non-governmental and community based organisations	• SEP and Scoping Report • International ESIA package (ESIA, ESAP, ESMP), Non-Technical Summary, and Stakeholder Engagement Plan; • Public Grievance Procedure; • Regular updates on Project development.	• Public notices. • Electronic publications and press releases on the Amur GPP Project website. • Dissemination of hard copies at designated public locations. • Press releases in the local media. • Consultation meetings. • Information leaflets and brochures.
Government authorities and agencies	• SEP and Scoping Report • ESIA package (ESIA, ESAP, ESMP), Non-Technical Summary, and Stakeholder Engagement Plan; • Regular updates on Project development; • Additional types of Project's information if required for the purposes permitting and statutory reporting.	• Dissemination of hard copies of the Scoping Report and SEP at municipal administrations. • Dissemination of hard copies of the ESIA package, NTS and SEP at municipal (district and village) administrations. • Project status reports. • Meetings and roundtables.
Related businesses and enterprises	• Non-Technical Summary and Stakeholder Engagement Plan; • Public Grievance Procedure; • Updates on Project development and tender/procurement announcements.	• Electronic publications and press releases on the Amur GPP Project website. • Information leaflets and brochures. • Procurement notifications.
Project Employees	• Employee Grievance Procedure; • Updates on Project development.	• Staff handbook. • Email updates covering the Project staff and personnel. • Regular meetings with the staff. • Posts on information boards in the offices and on site. • Reports, leaflets.

[8] See the SEP for a description of the Project's Public Grievance Procedure

3.4.1 COOPERATION AND ASSISTANCE AGREEMENTS

In addition to the engagement activities carried out as part of the statutory public review process and those planned for in accordance with international Lenders' requirements, GPPB has signed cooperation agreements with a number of the Amurskaya Oblast authorities (see Table 3-3).

Table 3-3 Cooperation and Assistance Agreements

Date	Authority Name	Summary of Agreement
22.04.2011	Government of the Amurskaya Oblast	<u>OAO GAZPROM will cooperate with the Government in following areas</u>: • Development and implementation of the Amurskaya Oblast Gasification Programme. • Development and implementation of the energy saving Programmes. • Researching and developing the energy sources projects in the Amurskaya Oblast. • Development and implementation of a complex system of environmental monitoring of the areas affected by the hydrocarbons transportation. • Registering for the tax purposes in the Amurskaya Oblast and paying the local taxes and other mandatory payments to the Amurskaya Oblast budget. <u>GPPB and the Government together</u> • will carry out joint investment projects in the Amurskaya Oblast in order to improve the local economy. • will ensure safety and security at the Project facilities and implement measures for avoiding any H&S or environmental emergency situations, <u>The Government promised to</u> • ensure (as far as the RF legislation allows) that GPPB is paid on time for any gas supplied to the consumers in the Amurskaya Oblast. • support GPPB in the land allocation process and changing the land categorisation for the selected plots if required. • support GPPB in the process of obtaining approvals and permits required for the Project. • support the engineering surveys carried out for the Project. • provide financial and tax benefits to the investment projects developed for gasification, energy efficiency, and environmental improvements in the Amurskaya Oblast. • Limit payments for renting the land plots used for the gas transportation networks.

Date	Authority Name	Summary of Agreement
06.07.2015	GKU Amuruprador, State Road Authority for the Amurskaya Oblast	GKU Amuruprador agreed to carry out the following: • Allow GPPB an unobstructed access to the roads according to the RF regulations. • Forward instructions to GPPB to carry out the road repairs according to the Article 31.10 of the Federal Law №253-FZ dated 08.11.2007 "On the Motorways and Road Works in the Russian Federation". GPPB agreed to carry out the following: • Inspect the initial condition of the roads planned for being used for the Project together with GKU Amuruprador representatives. • Carry out monthly inspections of the used roads together with GKU Amuruprador representatives. • Transport any oversized and/or dangerous goods according to the RF regulations. • Organise monitoring and repairs of the roads used for transporting goods to the Project sites. • Pay compensations for repairing the public roads used by the Project, but not exceeding the budget for such compensations allocated within the approved AGPP construction budget.
09.07.2015	The Employment Service of the Amurskaya Oblast	GPPB agreed a Plan for cooperation with the Employment Service in 2015-2017 in order to ensure engagement of the local population in the Project.
14.12.2015	Government of the Amurskaya Oblast	The Government agreed to carry out the following: • Provide support to GPPB in developing the Amur GPP Project. • Participate in the Land Allocation Commissions in order to provide information about the local gas infrastructure and help avoiding any incidents with the local gas infrastructure during the Project implementation. GPPB agreed to carry out the following: GPPB will cooperate with the Government in following areas: • Land allocation for the Project. • Development and implementation of the energy saving Programmes. • Development and implementation of a complex system of environmental monitoring of the areas affected by the Project. • Development of the joint investment programmes together with the Government. • Ensuring involvement of the local businesses and local staff in the Project. • Public engagements for updating the local population about the progress of the Project implementation, etc. GPPB promised to participate in the social and economic development of the Amurskaya Oblast by: • Registering for the tax purposes in the Amurskaya Oblast and paying the local taxes and other mandatory payments to the Amurskaya Oblast budget, and • Investing into the local social and engineering infrastructure projects.

Date	Authority Name	Summary of Agreement
21.12.2015	Ministry of the Amurskaya Oblast for Education and Science	The Ministry agreed to carry out the following: • Draft a list of the technical professional education bodies which are providing staff training for GPPB and forward it to GPPB for approval (yearly). • Enrol sufficient numbers of students to study for the professions required for GPP according to the GPP's requests (yearly). • Carry out presentations of the professions required at GPPB in the local schools (together with GPPB). • Ensure high level of the educational standards in the educational bodies of the Amurskaya Oblast. GPPB agreed to carry out the following: • Develop a forecast of the vacancies expected at GPPB (yearly). • Sign agreements with the local professional education bodies for training students who would be working at GPP. • Provide support and training to the teachers of the local professional education bodies. • Gift some teaching materials and equipment to the local professional education bodies.

4 PROJECT ALTERNATIVES

4.1 BACKGROUND

The basis for the development of the Amur GPP was set in the Gazprom's EGP, baseline document for developing the gas industry in Eastern Russia. EGP stipulates that gas processing and gas chemical industries will be developed in the Far East of the Russian Federation together with gas production centres and the unified gas transmission system.

AGPP is an essential part of the process chain of natural gas supply to China. In May 21, 2014 Gazprom and CNPC signed the Purchase and Sale Agreement for the Russian gas supply via the Eastern Route (Power of Siberia gas pipeline). The 30-year contract provides for Russian gas supplies to China in the amount of 38 billion cubic meters a year. Gas supplies under the contract will commence between May 2019 and May 2021. The Purchase and Sale Agreement is supported by the Agreement between the RF Government and the Government of the People's Republic of China in the area of gas supply from RF to China by the Eastern route signed in Moscow on 14 October 2014. The volume of exported gas will increase gradually as shown in Table 4-1.

Table 4-1 Schedule of gas production

Year	2021	2022	2023	2024	2025	2026 - 2030
Volume of gas exported to China, billion standard m^3 per year	3.08	10	15	22	30	38
Volume of produced helium, 10^3 standard m^3 per year	20	40	40	60	60	60

4.2 THE 'NO PROJECT' ALTERNATIVE

The 'no project' alternative considers the outcomes should the Project not go ahead. In this case, not developing the Project would mean that there would be no facilities available for treating gas transported to China via the *Power of Siberia* pipeline. This would result in:

- Failure of the Russian Federation commitments stipulated in the Purchase and Sale Agreement for the Russian gas supply to China via the Eastern Route;
- Consequent 'no project' alternative for the Sibur's deep hydrocarbon conversion plant as there would be no supply of ethane there;
- No facilities available for helium production; therefore, this valuable gas component would not be utilised.

The 'no project' alternative would also lead to:

- The loss of a development project of both national economic importance and international energy resource importance, and

- The loss of regional development and inward investment opportunities associated with the Project in the Amurskaya Oblast.

The 'no project' option would avoid the potential adverse environmental and social impacts identified in Section 7 of this scoping report. However, the economic, social and environmental benefits of the Project associated with the aspects identified above, coupled with the international demand for gas, are compelling.

4.3 PROJECT LOCATION OPTIONS

The Amur GPP is a greenfield development. Gazprom considered two options of the Project location (Figure 4.1):

1. Location in the centre of Seryshevsky Administrative District in 25 km North-East from Belogorsk and 20 km from Seryshev,
2. Location within Svobodnensky Administrative District in 13 km North from Svobodny.

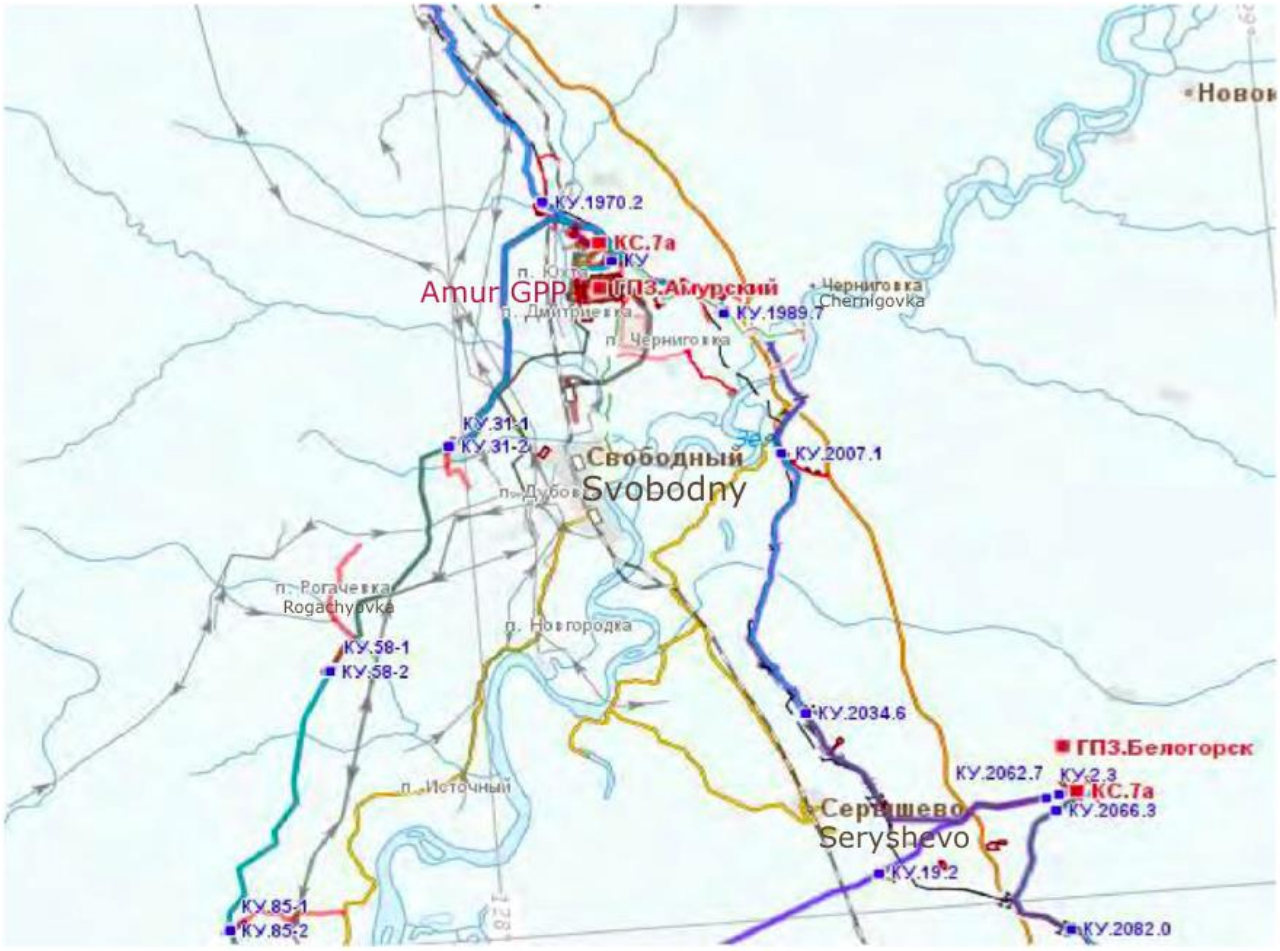


Figure 4.1 AGPP Project location options

These options are compared in Table 4-2.

Upon careful comparison of the two location options, Gazprom gave preference to the project site near Svobodny. This option received a strong support of the Svobodnensky District Administration.

Table 4-2 Comparison of the Project location options

Aspect		Project site near Belogorsk	Project site near Svobodny
Technical, economic, social & logistical	RoW of the Power of Siberia pipeline	• River crossing section under the Zeya River would be required for supplying gas to AGPP.	• River crossing section would not be required under the Zeya River. • The pipeline would be shorter in comparison with the Belogorsk option by 80-85 km. • Consequently, Gazprom would save about 1 billion USD.
	Export gas pipeline (supplying gas from AGPP to China)		Export pipeline would be 30-50 km shorter in comparison with the Belogorsk option.
	Available infrastructure / transportation routes	The Project site is close to: • Trans-Siberian railway, • R-297 'Amur' motorway, • Blagoveshchensk airport, • There are no airports next to the Project site, • There are no river ports or navigable rivers close to the Project site.	Shortest import / export shipping distances. The Project site is close to: • Trans-Siberian railway, • R-297 'Amur' motorway, • Blagoveshchensk and Svobodny airports, and • Four river ports: Blagoveshchensky, Svobodnensky, Poyarkovsky, and Zeysky.
	Available workforce, accommodation, and social infrastructure	• The skilled workforce would be transferred from other RF regions and also hired from the nearby settlements; • The nearest town is Seryshev located 20 km away from the Project site. Another town close to the Project site is Belogorsk located 25 km from the Project site. • The social infrastructure and some accommodation in these towns would be available to the Project staff. Although, an investment into the social infrastructure and accommodation would be necessary.	• The skilled workforce would be transferred from other regions and also hired from the nearby settlements; • The nearest town is Svobodny located 13 km from the Project site. • The social infrastructure and some accommodation in this town would be available to the Project staff. Although, an investment into the social infrastructure and accommodation would be necessary.

Aspect		Project site near Belogorsk	Project site near Svobodny
	Distance for transporting ethane to the Sibur's deep hydrocarbon conversion plant	About 80 km.	Sibur's deep hydrocarbon conversion plant would be located immediately next to AGPP.
	Overall cost comparison		Overall savings in comparison with the Belogorsk option: about 22 – 24 billion Russian roubles.
Environmental		Impacts on the freshwater environment and Zeya River banks resulting from the construction of the underground crossing of the gas pipeline.	Eliminates impacts on the freshwater environment due to avoidance of the gas pipeline river crossing.

4.4 TECHNOLOGICAL OPTIONS FOR NATURAL GAS PROCESSING

Initially, GPPB planned installing seven technological lines at the Amur GPP, but the Project structure was optimised and reduced to six technological lines in the beginning of 2016. The total annual capacity of the remaining six process lines at 42 billion m^3 will be sufficient for fulfilling the contractual requirements for exporting gas to China.

The natural gas processing equipment for Amur GPP has been proposed by two engineering contractors:

- Kriogenmash utilising technology provided by Air Liquide S.A., France and
- Peton utilising technology provided by Linde A.G.

The Air Liquide and Linde's technological options comparison is provided in Figure 4.2 and Table 4-3. Although both technological options appeared to be in compliance with RF environmental requirements, it was estimated[9] that the Linde option would release noticeably lesser amounts of the greenhouse gases, use significantly less water, and discharge smaller volumes of wastewater (Table 4-3). This option is definitely preferable from the environmental point of view.

These two technological options were carefully assessed by GPPB based on the engineering, financial and environmental criteria, and the technological option provided by Linde A.G. was finally given a preference.

[9] As stated in the OVOS Report for the Project

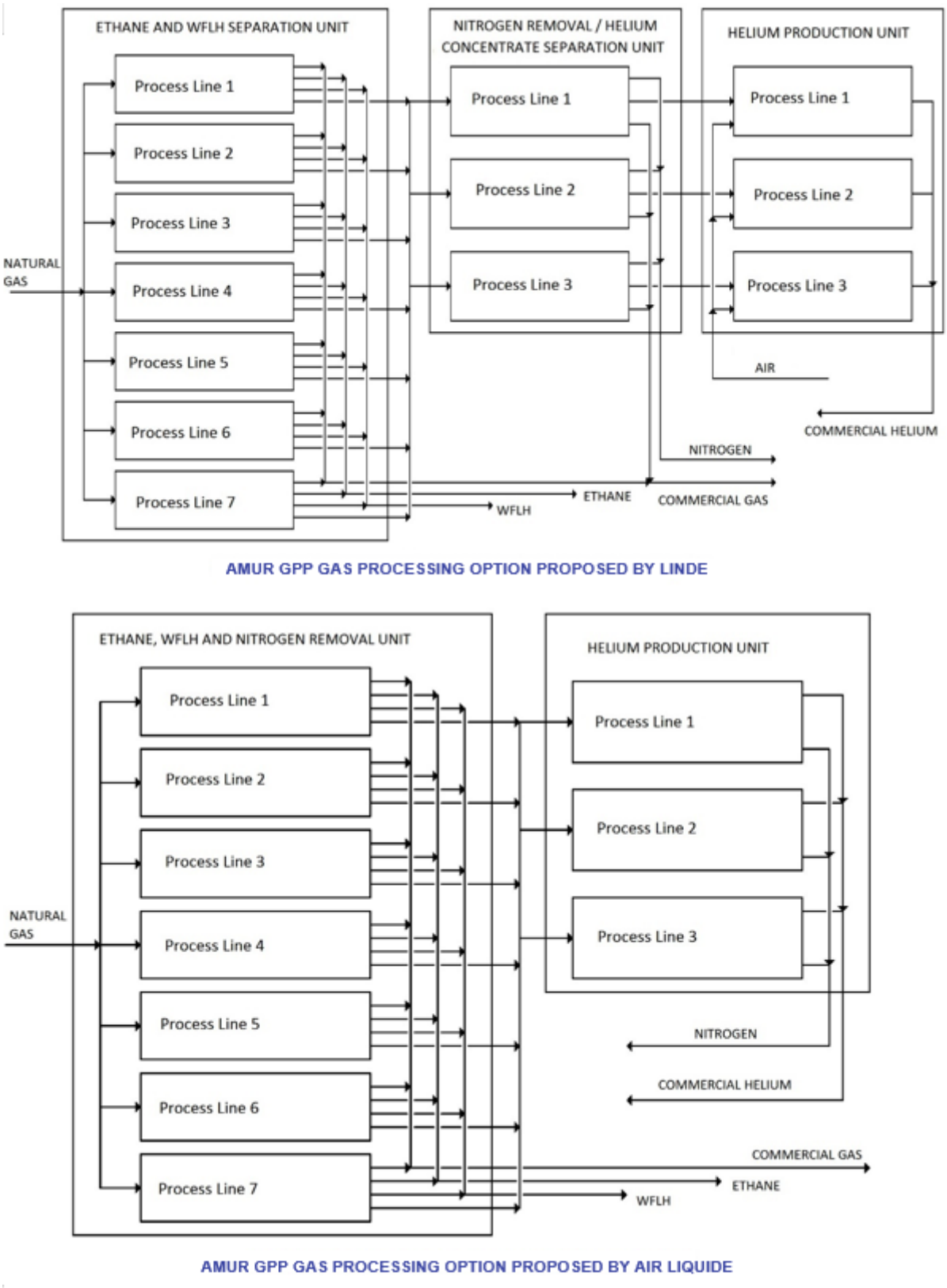


Figure 4.2 Technological options for natural gas processing at AGPP

Table 4-3 Comparison of two gas processing technology options

Aspect		Criteria	Linde Option	Air Liquide Option
Environmental (N.B.: Data is quoted from OVOS)	Air Emissions	Total emissions per year, tons	11,578.3	6,307.5
		Main air pollutants	• CO - 71.2 %, • NO_2 – 17.8 %, • NO - 10.9 %, • Saturated hydrocarbons C_1-C_5 – 4.2%.	• CO - 31.7 %, • NO_2 - 18.4%, • NO - 11.4% • Methane – 29.2%.
		Maximum concentrations of pollutants during the normal AGPP operation calculated at the border of Yukhta settlement, units of MPC (maximum permissible concentration)	• NO - 0.57 - 0.60 MPC, • CO - 0.53 MPC, • NO and SO_2 jointly – 0.37 – 0.39 MPC.	• NO – 0.64 - 0.70 MPC, • CO – 0.55 - 0.56 MPC, • NO and SO_2 jointly – 0.42 – 0.46 MPC.
		Zone of impact of the designed facilities on the air quality during the normal operation of AGPP (as calculated for NO_2), m from the Project site border	7,250 – 11,180	13,800 – 15,500
	Water consumption (total for six Project Stages), 10^3 m^3 per year	1531.026		3867.186
	Wastewater discharges (total for six Project Stages / including rainwater drainage), 10^3 m^3 per year	2345.494		2831.144
	Noise (at the Project site boundary)	6.8 dBA		61.9 dBA

5 PROJECT DESCRIPTION

5.1 GENERAL INFORMATION

AGPP with a design capacity of 42 billion cubic meters of gas per year is being constructed by Gazprom near Svobodny town in the Amurskaya Oblast. AGPP is designed to extract important components from natural gas and serve as a valuable link in the process of supplying natural gas to China through the eastern route. AGPP will include the world's largest helium production facility. A number of products of a high market value will be produced there (Table 5.1):

Table 5-1 Products of gas separation (as of 2026)

Products	Units per year	Value
Commercial gas (methane fraction)	10^9 standard m^3	39.05
Commercial helium	10^6 standard m^3	60
Ethane fraction	10^3 tons	1875
Propane fraction	10^3 tons	972.6
Butane fraction	10^3 tons	452
Pentane/Hexane fraction	10^3 tons	205.2
Wide light hydrocarbons fraction	10^9 standard m^3	0.88
Total losses including excessive nitrogen	10^9 standard m^3	1.39

The RF Government Decree №1686-r from 31 August 2015 announced support to developing the major infrastructure projects required for fulfilling the RF obligations under the gas supply contract with China. This Decree included AGPP in the list of priority major projects supported by the RF Government. As one of the support measures, the RF Government can waive the customs taxes and VAT on the imported engineering equipment which is not produced in Russia.

The AGPP Project organisational structure is summarised in Figure 5.1.

GPPB was set up by Gazprom Pererabotka and Gazprom Gazoraspredelenie as the company dedicated to implementation of AGPP Project. NIPIGAZ is acting on behalf of GPPB as a general contractor responsible for AGPP Project development.

Linde AG, Germany will deliver the core process equipment for AGPP, including engineering and supply of units for ethane and natural gas liquids extraction and nitrogen rejection, as well as for helium purification, liquefaction, and storage. The Technological Engineering Holding Peton has been selected to adapt Linde technologies under the localisation programme. Front-end engineering design (FEED) development and project documentation are also provided by Peton.

A state-of-the-art training centre was opened by Peton as part of the Project to prepare staff for management of the processing facility and helium complex. Scheduled to begin operation in 2015, the training centre will be equipped with technology.

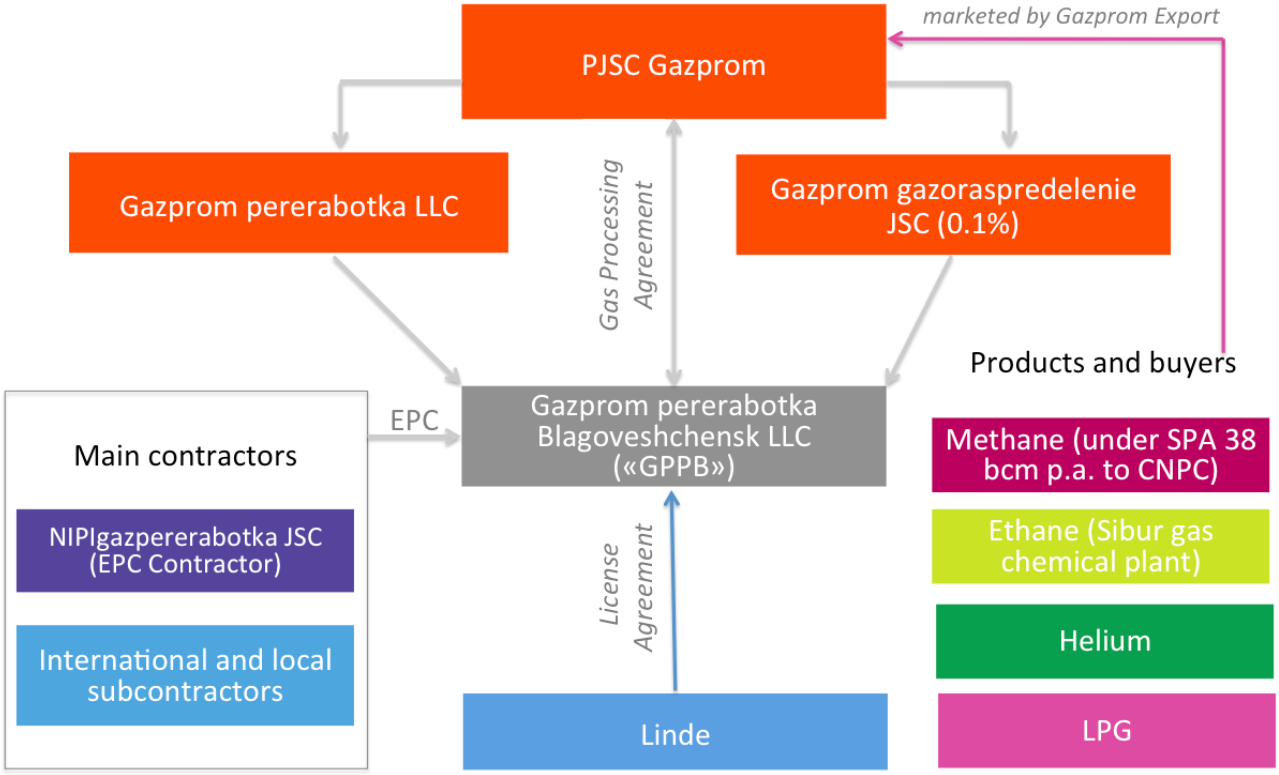


Figure 5.1 Organisational structure of the Amur GPP Project

5.2 PROJECT LOCATION

The AGPP Project site is located in the Svobodnensky Administrative District of the Amurskaya Oblast at a distance 10-15 km (or about 22 km by road) from Svobodny town[10] (Figure 5.2, Figure 5.3).

The distances from the AGPP Project site to other nearby settlements are as follows:

- Yukhta settlement – 2.3 km,
- Garden/Vegetable allotments of the Yukhta settlement – 1.7 km,
- Tchernigovka village – 7.14 km,
- Dmitrievka village – 2.9 km.

The Project site is located in 10-15 km (or about 30 km by the R-297 'Amur' motorway) from the Zeya River and about 45 km from the Svobodny port. The AGPP Project is conveniently placed at the crossroads of the transnational and transregional transport corridors:

[10] The Project site GPS coordinates: 51°32'11"N 128°10'55"E.

- The nearest airports are located near Blagoveshchensk and Svobodny.
- There are four river ports in the Amurskaya oblast: Blagoveshchensky, Svobodnensky, Poyarkovsky, and Zeisky, which are serviced by nine river transportation companies. All these ports are providing facilities for exporting/importing goods to/from China.
- The Trans-Siberian Railway is passing only 2-5 km West to the Project site.
- The Federal motorway R-297 ('Amur') is passing about 7-8 km North-East to the Project site. The distance by road between the Project site and R-297 is 23 km.

A temporary berth will be constructed on the right bank of the Zeya River for transportation of oversized cargos during the construction period (6 km from Tchernigivka village near the point where the River Gashchenka falls into the Zeya River).

The gas supply to AGPP will be provided by two underground pipelines connected to the Power of Siberia pipeline" located at a distance of 3 km from the Project site. The processed gas (methane fraction) will be directed to the compression station KS 7aZeiskaya by two underground pipelines and exported to China over the Power of Siberia pipeline.

The Project site is located next to the planned development of the Sibur's deep hydrocarbon conversion plant which would start utilising ethane produced by AGPP by 2024.

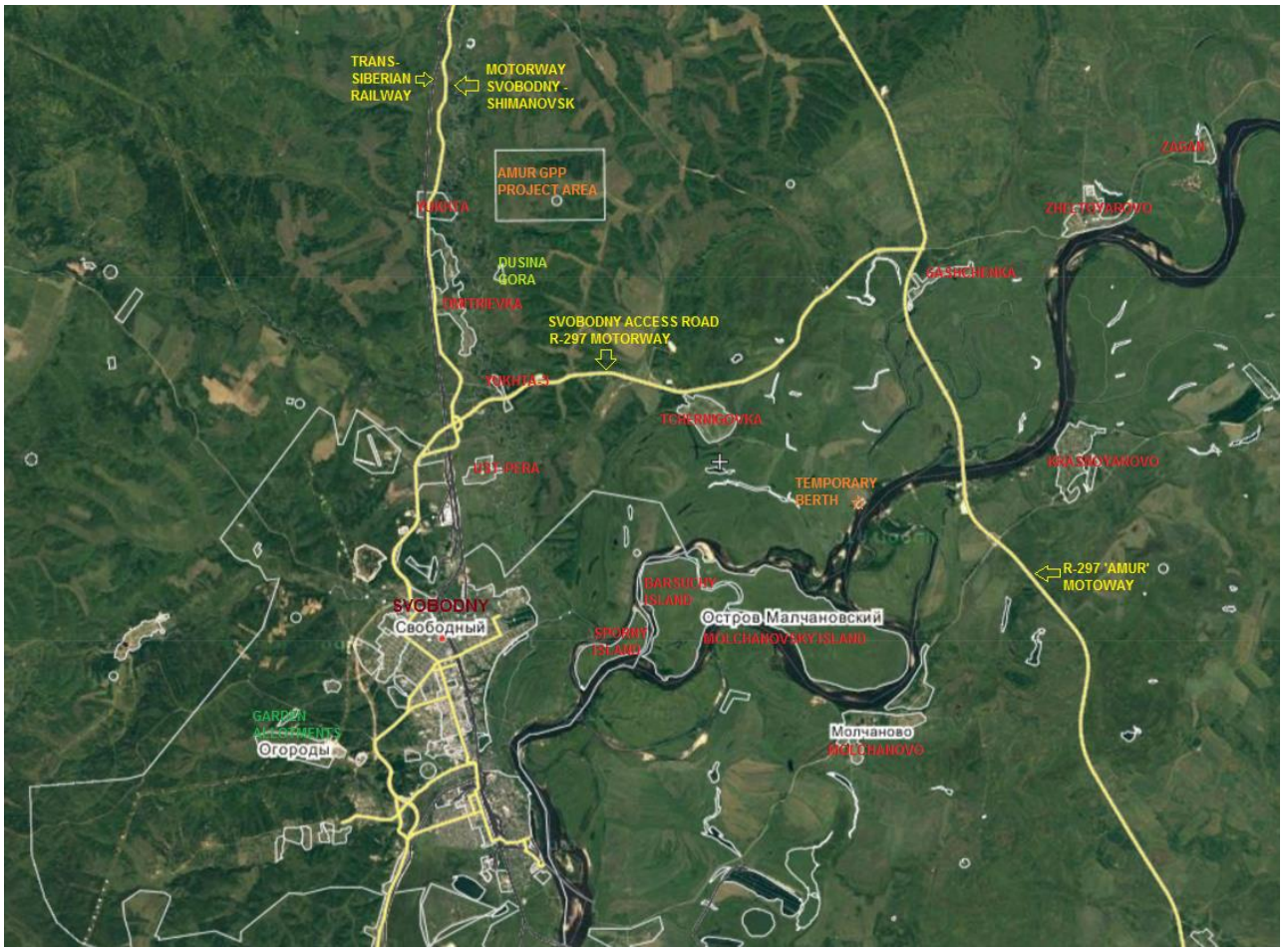


Figure 5.2 Satellite map of the Project location

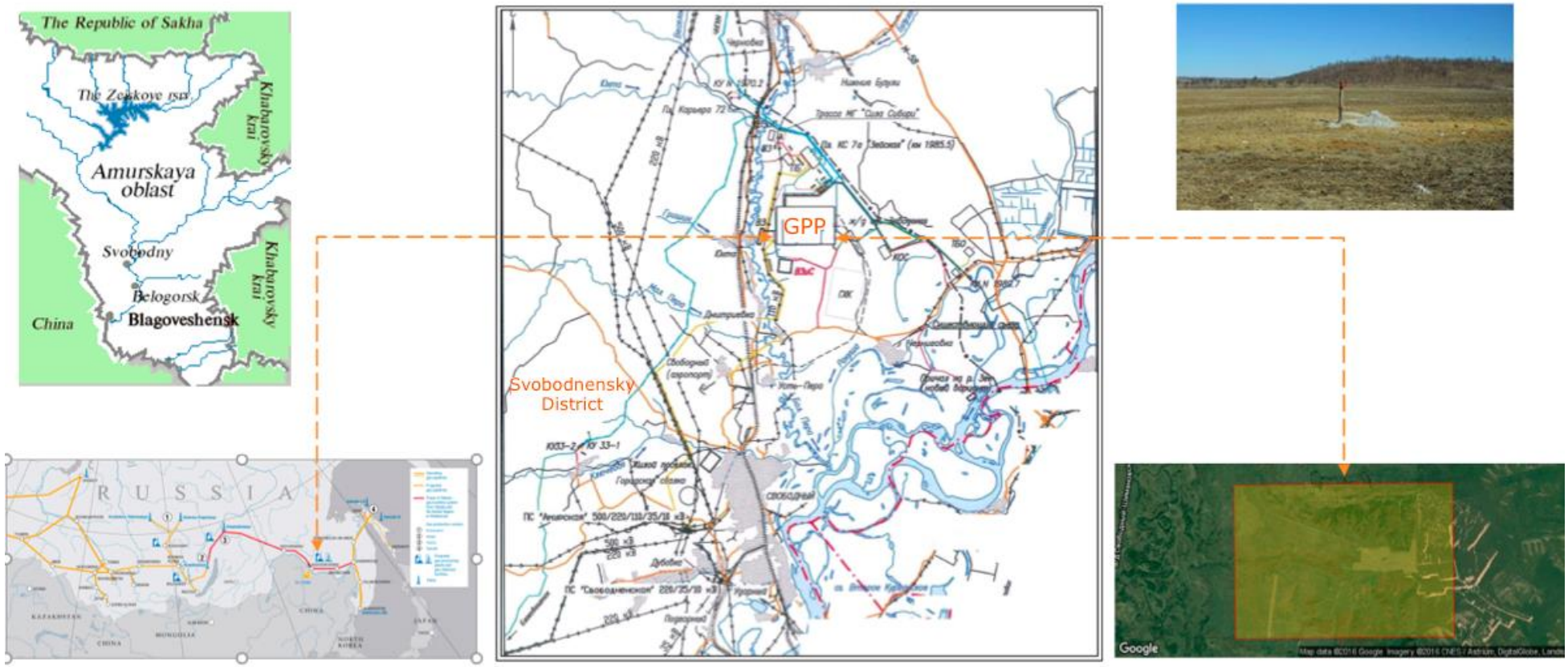


Figure 5.3 Overview of the Amur GPP Project location

5.3 PROJECT DEVELOPMENT TIMELINE AND CURRENT STATUS

The AGPP Project has been started in December 2012 when Gazprom appointed Gazprom Pererabotka as the Client responsible for developing the Project. Consequently, OOO Gazprom Pererabotka appointed PAO VNIPI Gazdobycha as General Design Contractor in April 2014. OOO "Gazprom Pererabotka" and OOO "Gazprom Gazoraspdeleie" established OOO "Gazprom Pererabotka Blagoveshchensk" (GPPB) in December 2014 as a special-purpose company dedicated to implementing the Amur Gas Plant Project.

Gazprom synchronised development of gas production, construction of the pipeline, and start-up of gas processing activities specifically under the EGP framework. The first phase of the Power of Siberia gas pipeline, Chayanda - Blagoveshchensk is expected to be commissioned in 2020 providing gas supply to AGPP from Yakutia. Process trains of AGPP will be commissioned in five phases in accordance with the development of the production centres in the Yakutia and the Irkutsk Oblast. The first AGPP phase is planned for completion in 2018 while the whole Project is scheduled for commissioning in 2025.

The Project Design Documentations have been completed in May 2016 and submitted to Glavgosexpertiza for review and approval, a positive conclusion of Glavgosexpertiza has been received in August 2016. The completion of Detailed Project Design documentation is planned in the second quarter of 2017. Receiving of Glavgosexpertiza conclusion is planned in July 2017, for Phase 5 - in second quarter of 2017

Construction of AGPP main engineering facilities and infrastructure is planned in six stages:

- Stage 1. Early works facilities;
- Stage 2. Railway infrastructure;
- Stage 3. Project infrastructure and auxiliary facilities;
- Stage 4. Gas processing plant;
- Stage 5. Housing estate;
- Stage 6. Solid Domestic & Production Wastes Landfill.

Some of these stages are overlapping or running concurrently according to the Project schedule in Figure 5.4. The current status of the Project stages is reflected in Table A-1, Annex A.

The start of AGPP construction was officially announced by the RF Government in October 2015 with initiation of **Stage 1, Early Works Facilities**. It involves site clearance and landscaping; building temporary facilities; providing site accommodation for the construction contractors and other Project staff; providing water, heat, power supply, and wastewater treatment equipment, etc. As of April 2016, the Early Works Stage was ongoing with about 82% of the priority activities already carried out. This Stage is planned for completion in December 2016.

Stage 2, **Railway infrastructure and facilities** construction has been launched in July 2016. OOO SvyazStroyMontazh (SSM) was awarded a contract to construct the railway track section from the Ust-Pyora public station of the Trans-Siberian railway to the Project site (about 15 km long). Two rail stations will be built close to the Project site, Zavodskaya-1 and Zavodskaya-2. SSM is carrying out design, preparatory and excavation works; setting up the permanent railway,

utility networks and equipment; and erecting associated engineering structures, buildings, and railroad infrastructure facilities.

Stage 3, Auxiliary facilities started in May 2016 and includes construction of the Project infrastructure designed to transport and store over 2.6 million tons of cargo a year. This Stage is including construction of the access roads and bridges. The auxiliary facilities that will be constructed include vehicles parking and repairs workshop, fuel storage and fuelling station, water treatment plant, etc. A temporary berth will be constructed at the Zeya River for the materials and equipment shipments by the river during the construction stage.

GPPB plans to begin **Stage 4, Gas processing plant** in the end of 2016 starting with construction of the AGPP foundations. The first stage of Stage 4 involves construction of two C_2H_6 and WFLH (propane, butane, pentane and hexane mixture) extraction and N_2 rejection units, and a helium production unit[11]. They are scheduled to be commissioned in 2019. Four more such gas processing units will be built further by 2025, i.e. one gas processing unit each year.

The design documentation for **Stage 5, Residential area** for the Project staff in Svobodny**,** and **Stage 6, Solid Domestic & Production Wastes Landfill** have been completed, but their construction is not commenced yet.

[11] http://www.gasworld.com/russia-helium-surge-continues-as-linde-contracted-by-gazprom/2009834.article

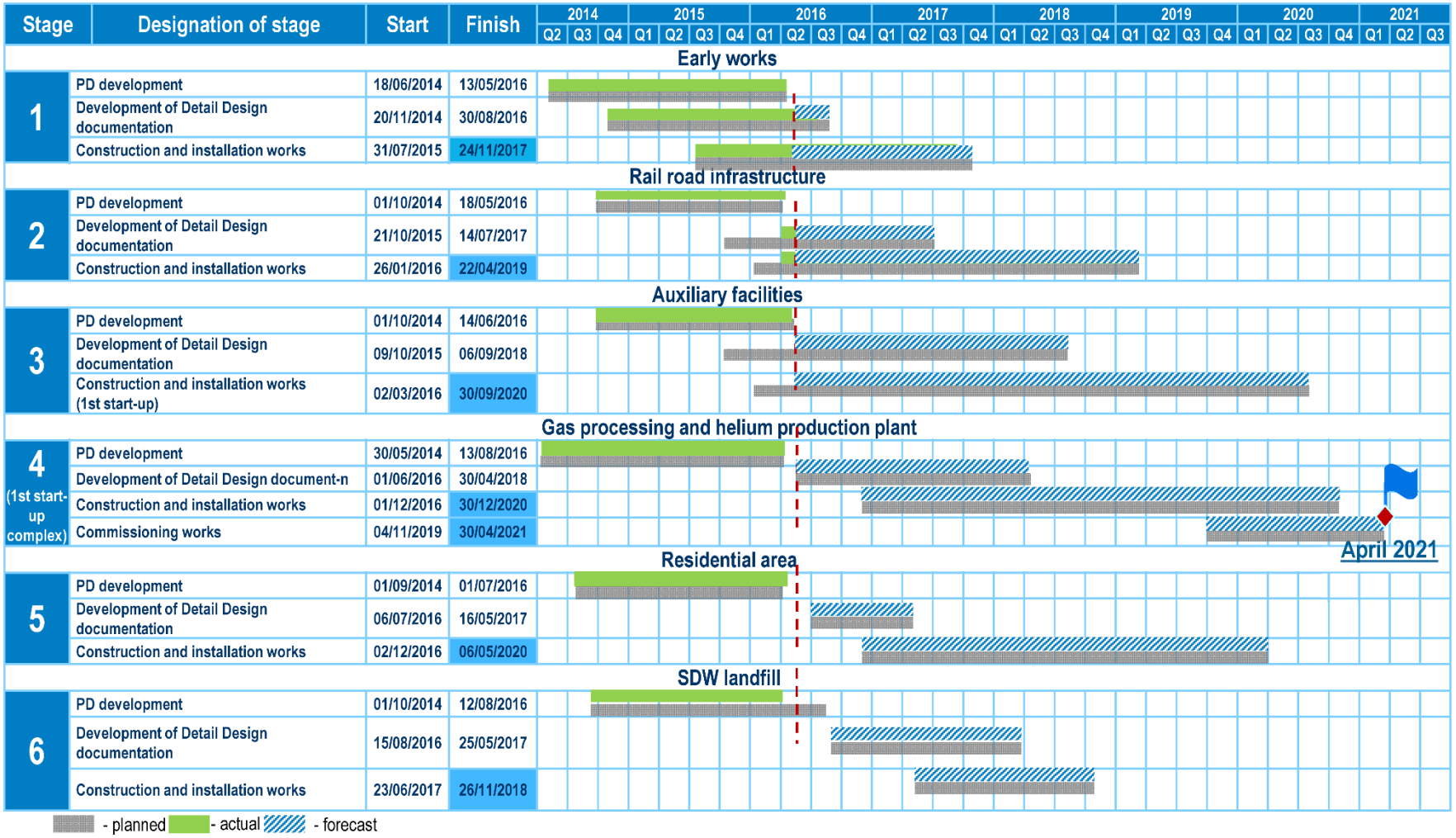


Figure 5.4 Amur GPP Project schedule

5.4 MAIN FACILITIES AND PROCESSES

The natural gas is supplied to AGPP by two lines of the Power of Siberia gas pipeline. It is satisfying the requirements of Gazprom's internal standard STO 089-2010.

The AGPP Project design is based on six process lines capable of processing 7 billion m^3 of the natural gas per year each (Figure 5.5), i.e. up to 42 billion m^3 of the natural gas per year in total. A section of the Project site is reserved for the 7th and 8th process lines should the demand for the gas export to China increase. The process lines are performing independently, but they are all necessary for ensuring the quantities and properties of the exported gas according to the conditions of the Purchase and Sale Agreement. A simplified natural gas processing flowchart is pictured in Figure 5.6.

The Amur GPP includes the following main technology components (Table 5-2):

Table 5-2 Main components of the gas processing plant

№№	Process units	Number of process lines
1	Natural gas metering units	2
2	Gas purification and drying units	6
3	Ethane and WFLH separation, nitrogen removal and nitrogen/helium concentrate production unit	6
4	Ethane metering units	6
5	Gas fractioning unit	3
6	WFLH purification unit	3
7	Helium production unit[12]	3
8	Methane fraction booster compression stations	6
9	Methane metering units	2
10	Flaring system units	3
11	Tank farm for storing liquefied gases (commercial products)	3
12	Trestles and a section of railway for loading the exported liquefied gases	2
13	Fuel gas metering units	2
14	Fuel gas preparation unit	1
15	Air and nitrogen production units	3

[12] Another 3 process lines are planned in the future.

Figure 5.5 Designer's view of the Amur GPP

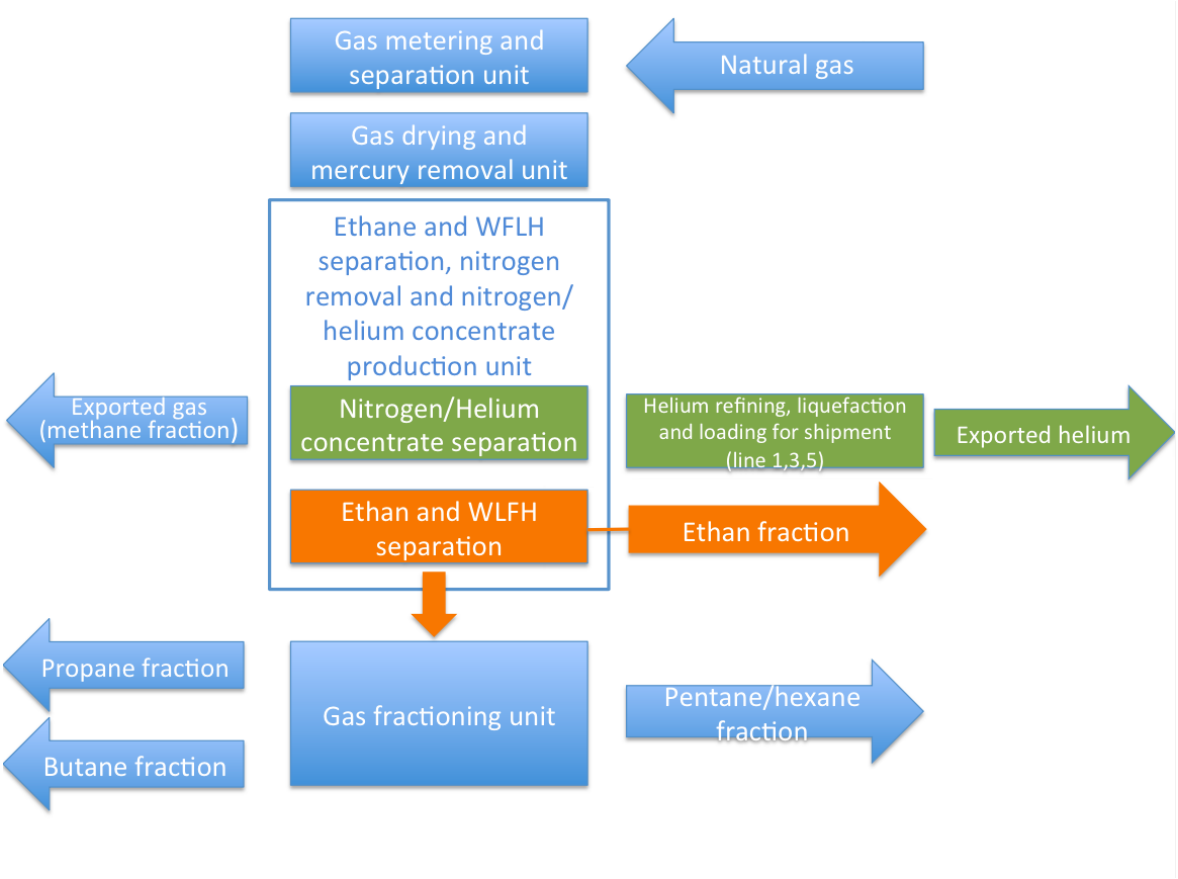


Figure 5.6 Natural gas processing flowchart

All process lines are designed identically; therefore, the following description of a process line is applicable to any of them.

The incoming gas is metered at entering AGPP and supplied to the gas purification and drying units where it is dried by a zeolite absorbent. The used absorbent is regenerated and re-used.

The dried gas is further stripped of any mercury and methanol contamination by an absorbent and is treated at the cryogenic ethane and WFLH separation, nitrogen removal, and nitrogen/helium concentrate production unit. Gas separation is ensured by the cryogenic temperatures resulting from expansion of gas in the turbine expanders and also by means of the heat pumps.

The products of gas separation at this stage are methane, hydrocarbons C2+B, and helium/nitrogen gas fractions. These fractions are further processed at this unit:

- The methane fraction is compressed in the booster compression station; compressed methane is metered and supplied into the export pipeline;
- The nitrogen/ helium fraction flows to the helium refining, liquefaction and loading unit where it is separated at the cryogenic temperatures into nitrogen and helium. Nitrogen is forwarded in the nitrogen management system, and any excess nitrogen released into the atmosphere. The liquefied helium is transported to the consumers in specially designed tanks either by road or by rail.
- Fraction C2+B is separated into WFLH and ethane fractions:
    - WFLH fraction is stripped of mercaptan impurities by a zeolite absorbent and forwarded to the gas fractioning unit; WFLH can be sold as a final product if required.
    - Ethane fraction is transported to the deep hydrocarbon conversion plant (N.B.: initially ethane would be forwarded to the gas export pipeline until the deep hydrocarbon conversion plant is commissioned).
- WFLH fraction is further separated at a cryogenic gas fractioning unit into propane, butane, and pentane/hexane fractions. These fractions are loaded into specially designed tanks and traded commercially.

In the Amur GPP development, The Linde Group (Linde) is the supplier of all core process equipment used in the site's cryogenic recovery of helium. Linde will deliver licensing for cryogenic gas separation technology including engineering and supply of units for ethane and natural gas liquids extraction and nitrogen rejection, as well as for helium purification, liquefaction, and storage. Linde will engineer and supply units for ethane (C_2H_6) and WFLH extraction and nitrogen rejection, as well as for helium purification, liquefaction, and storage.

5.5 FLARING SYSTEM

The flaring system is located on two Project sites:

- Flaring separators and liquid collectors site, and
- Flares site.

Flaring separators are used for preventing liquids from directly entering the flair stacks during the gas discharges. The separated gases are metered and sent to the flair stacks for combustion. The remaining condensate is collected in a drainage tank provided with a submersible pump.

AGPP's flaring system comprises:

- Dry gas flaring system utilising the wet warm gas coming from the gas cleaning and separation unit and gas drying unit;
- Wet gas flaring system utilising the dry and cooled gas produced at the ethane and WFLJ separation unit, nitrogen separation and helium concentrate preparation unit, and the dry gas from the gas fractioning unit;
- Gas venting stacks for releasing nitrogen separated from the nitrogen-helium concentrate.

The flaring system is also used during the non-routine operations or emergency situations resulting in gas releases.

5.6 WATER SUPPLY

5.6.1 PROJECT CONSTRUCTION

Water is provided to the Project construction sites for the following purposes:

- Public water supply for the construction staff;
- Water for the construction activities: preparation of drilling muds used for drilling underground water wells, preparation of concrete, hydrotesting of the pipelines and tanks, etc.

Construction contractors are independently responsible for water supply to their Project sites including obtaining permits and contracts for water use.

The following options of the water supply have been considered:

1. Underground water abstraction near the Bolshaya Pera river;
2. Beregovoy underground water reserves (Zeya river);
3. Underground water abstraction at the watershed area near the GPP site;
4. Freshwater abstraction from the Zeya river.

Since the first option was preferred, a water abstraction facility was designed with 6 main and 3 backup water wells with flow rate of 864 m^3 per day each.

The main sources of water are:

- Project Stage 1, Early Works: Water is supplied by a contractor using the road tanks coming from Svobodny.
- Project Stages 2 – 4: Water is supplied by an underground pipeline from the underground water abstraction facility.

A water treatment plant is planned at the temporary facilities site for treating water according to the RF drinking water requirements.

It is estimated that the total water consumption during the construction period would be 2,797,947 m^3 (including 7,780 m^3 supplied from Svobodny by the road tanks).

5.6.2 PROJECT OPERATIONS

Water is required during the Project operations period for the following purposes:

- Water for drinking and domestic use,
- Water for industrial use, e.g.: AGPP facilities cleaning, water for the heating system, cleaning cars, watering green areas and trees, cleaning pavements, etc.

The main source of water supply for AGPP is underground water provided from the wells located in the Bolshaya Pera river valley. The water abstraction site comprises seven wells (4 working wells, 2 backup wells and 1 observation well). The wells are planned to be drilled up to 150 m deep. The water abstraction site is fenced at a distance of 50 m away from the wells in order to restrict access to the sanitary protection area around the wells. Since the underground water quality is not satisfying the RF sanitary requirements, a water preparation plant is planned.

Water required for the rail stations is provided from the AGPP water supply system, and treated wastewater used for the fire protection.

Water is supplied to the water preparation plant and fire protection water reservoirs over the underground pipelines. Treated wastewater is used for feeding the fire protection system. There are separate water pipelines for supplying various types of water in the Project area:

- Drinking water,
- Fire protection water,
- Industrial water,
- Recycled water, and
- Underground water supply.

5.7 WASTEWATER MANAGEMENT

5.7.1 PROJECT CONSTRUCTION

The following categories of wastewater are generated at the Project sites during the construction period:

- Wastewater resulting from the human activities at the construction sites, offices and temporary accommodation, and
- Wastewater resulting from the Project facilities hydrotesting.

Construction contractors are independently responsible for disposal of the wastewater generated at the construction sites. The following wastewater management options are planned:

- Wastewater resulting from the human activities at the construction sites is accumulated in storage tanks and removed by a licensed contractor to the wastewater treatment facility in Svobodny.
- Wastewater generated in the temporary accommodation area is treated using a biological wastewater treatment plant located in the temporary facilities area.
- Wastewater released after the hydrotesting procedures is moved by the road tankers to the mechanical wastewater treatment facility located in the temporary facilities area.

The purified wastewater satisfies the RF fisheries water quality requirements. It is released to the Bolshaya Pera river over an underground pipeline (Figure 5.7).

Figure 5.7 Treated wastewater discharge location

5.7.2 PROJECT OPERATIONS

The following categories of wastewater are generated during the Project operations period:

- Wastewater resulting from the human activities at the Project sites, offices and accommodation,
- Wastewater discharged from the Project main facilities,
- Rainwater drained from the Project sites,
- Wastewater discharged after car washing.

GPPB is responsible for treatment of wastewater generated at the Project sites / facilities. The Project comprises a number of wastewater treatment plants designed for treating each of the above listed wastewater categories. The wastewater is collected into the storage tanks over a system of underground pipelines, treated according to the RF fisheries water quality requirements, and discharged to the Bolshaya Pera river over the underground pipeline (Figure 5.7).

5.8 WASTE MANAGEMENT

The following types of wastes are expected at the Project sites throughout the Project development cycle:

- Domestic: waste accumulating at the staff accommodation, kitchens, and offices;
- Industrial: construction waste, waste resulting from servicing the construction machinery, waste resulting from the water wells drilling, wastewater treatment wastes, etc.

These type of waste are described below for the Project construction and operations periods. Waste generated by activities of general contractor is owned by general contractor.

5.8.1 PROJECT CONSTRUCTION

Wastes are stored temporary at specially prepared locations, handed over to the licensed waste processing contractors, and disposed of at the licensed solid waste landfills outside the Project scope.

The anticipated waste types are listed in Table 5-3:

Table 5-3 Types of waste produced during the Project construction

Waste category[13]	Location	Waste
II	Project contractor's service bases	Disposed batteries
III	Project contractor's service bases	Waste oils and oiled materials: lubricants, oiled filters
	Wastewater treatment plant	Oil collected from the drainage
IV	Project offices	Office waste
	Underground water abstraction site	Drilling waste resulting from the water wells drilling
	Construction sites	Mineral wool
		Plasterboard cuttings
		Asphalt / bitumen containing wastes
		Painting tools and materials
		Welding slugs
	Project contractor's service bases	Oiled rugs and clothes
		Used PPE
	Wastewater treatment plant	Sludge
		Sediments resulting from the oily water treatment
	Project contractor's service bases	Used tires
		Oiled filters
V	Project contractor's service bases	Vulcanised rubber cuttings
		Clean packaging materials (wood, plastic, paper)
	Construction sites	Scrap metal
		Cable and wire cuttings
		Cement and concrete wastes
		Broken bricks
		Used welding rods
		Used brake pads
		Timber cuttings and wood chips

[13] As defined in in the RF Federal Waste Classification approved by the Order of *RF Federal Service for Control of the Natural Resources Use* №445 issued on 18.07.2014.

Waste category[13]	Location	Waste
	Kitchens serving the Project staff	Kitchen waste

5.8.2 PROJECT OPERATIONS

The waste types and waste disposal options anticipated during the Project operations are listed in Table 5-4:

Table 5-4 Types of waste produced during the Project operations

Waste category[14]	Location	Waste
II	Machinery servicing areas	Batteries
III	Machinery servicing areas	Copper cuttings
		Oiled sand
		Waste diesel fuel
		Waste filters
		Waste oil
IV	GPP yards	Non-industrial / low toxicity waste
	Machinery servicing areas	Tires with a metal cord
	Main and auxiliary facilities	PPE
	Metal processing workshops	Abrasive powder
	Project offices and accommodation	Domestic / Office waste
	Storage areas	Non-industrial / low toxicity waste
	Wastewater plants	Oiled wastewater treatment sludge
		Wastewater treatment sludge
V	Machinery servicing areas	Clean packaging materials (wood, plastic, paper)
		Used brake pads
		Used welding rods
		Vulcanised rubber cuttings
	Metal processing workshops	Clean metal scalps
		Grinding disks
		Metal chips

Waste of each category is collected separately, temporary stored in the dedicated locations, and processed further, i.e. scrap metals are handed over to the licensed waste management contractors, combustible waste is incinerated, and any remaining solid waste is disposed of at the Project landfill (Figure 5.8).

[14] As defined in in the RF Federal Waste Classification approved by the Order of *RF Federal Service for Control of the Natural Resources Use* №445 issued on 18.07.2014.

Figure 5.8 Location of the Project landfill

5.9 POWER SUPPLY AND HEATING

5.9.1 PROJECT CONSTRUCTION

The temporary facilities require about 30 MW of electric power supply. 'Zavodskaya' substation (35/10 kV; 11 km away from Svobodny) is under construction and will be used for supplying electric power to the Project temporary facilities. The deadline for its completion is July 2017.

In the meantime, electric power supply to the Project construction sites will be provided from the 'Stroitelnaya' substation (35/10 kV) and autonomous diesel power plants.

5.9.2 PROJECT OPERATIONS

The forecast of the regional electric power supply and consumption in Amurskaya Oblast indicated a power shortage by 2020[15]. Therefore, power supply for AGPP will be provided from the Power of Siberia's own thermal power plant. AGPP will be connected to the thermal power plant in 7 stages (Figure 5.9) according to the Project commissioning schedule.

The 'Zavodskaya' substation (220/110 kV) linked to existing 'Amurskaya" substation (500/200 kV) will be constructed for supplying electric power to the AGPP's main facilities. The overhead power lines will be placed along the RoW of other linear engineering facilities.

[15] http://www.ampravda.ru/2016/07/13/68146.html

The main source of heating at the GPP site is an automated water heating boiler plant. The boiler plant is fuelled initially with diesel which would be substituted by gas as soon as the fuel gas preparation unit is commissioned.

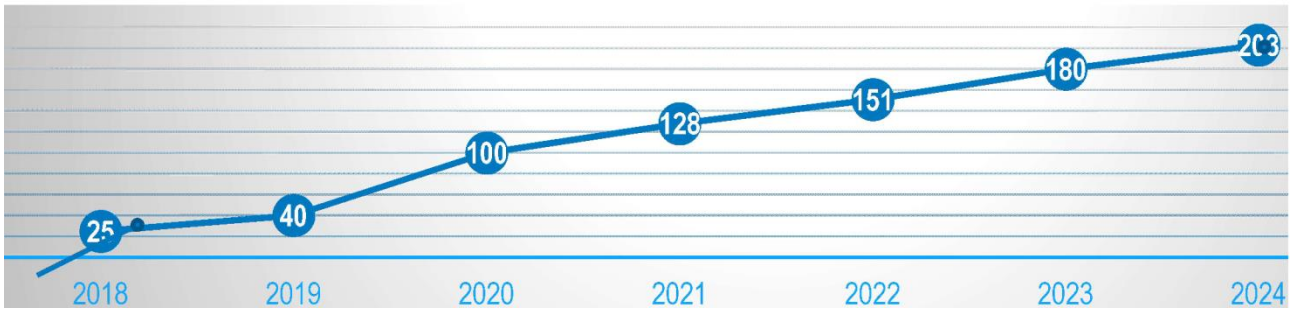


Figure 5.9 Electric power delivery schedule to Amur GPP year-wise, MW

5.10 AREA OF INFLUENCE, ASSOCIATED AND OUT-OF-SCOPE FACILITIES

5.10.1 AREA OF INFLUENCE

The Area of Influence will include areas both directly and indirectly affected by the Project within and beyond the Project area.

The areas directly affected by the Project include those affected by the direct physical impacts from the gas processing plant and associated auxiliary facilities which are all within the Project area

In addition to impacts within the Project area, the Project will also have direct and indirect impacts beyond the Project area including:

- AGPP construction:
  - Light and visual impacts outside the Project area.
  - Impacts on the river water quality downstream from the temporary berth at the Zeya River (only during the construction period).
  - Noise and air pollution resulting from the construction traffic.
  - Damage to the local roads from heavy lorries and construction machinery.
  - Socio-economic benefits to nearby communities and settlements within the Svobodnensky Administrative District.
- AGPP operation:
  - Light and visual impacts outside the Project area.
  - Noise and air pollution resulting from AGPP operations.
  - Noise and air pollution resulting from exporting commodities produced at AGPP by road tankers or railway.
  - Socio-economic benefits to nearby communities and settlements within the Svobodnensky Administrative District.

5.10.2 ASSOCIATED FACILITIES

In accordance with IFC Performance Standard, Associated Facilities are those activities and facilities that are not part of the financed project and would not be conducted, built or expanded if the Project was not carried out, and without which the Project would not be viable. Table 5-5 substantiates attribution of facilities/activities as Associated:

Table 5-5 Associated Facilities / Activities

Facilities / Activities	Is this facility / activity funded as part of the Project?	Would this facility / activity exist if the Project was not developed?	Would the Project be viable without this facility / activity?	Comments
Associated engineering facilities / activities:				
Transportation of cargos required for the AGPP construction (by contractors)	No	No	No	
Transportation of the cargos required for AGPP operation (by contractors)	No	No	No	
Power of Siberia power station and associated substations	No	No	No	OOO Gazprom Energo is tasked by Gasprom with management and servicing of the Project power infrastructure.
Compression Station KS-7a Zeiskaya	No	No	No	KS-7a Zeiskaya falls in the Project's area of influence because it is interconnected with the AGPP site with the dedicated gas import and export pipelines which are integrated in the Project.
Logistics bases/terminals for distributing the liquefied gases	No	No	No	OOO Gazprom Gazenergoset will develop a special logistics base near Vladivostok for managing the helium transportation operations. LPG trans-shipment terminal in the Vanino Port will be developed under a contract between OOO Gazprom Export and OOO Sakhatrans
Trains, lorries, and ships equipped for transportation of the liquefied gases / Transportation of the liquefied gases	No	No	No	The liquefied helium will be transported in special isothermal tanks (Figure 5.10). These tanks together with a fleet of lorries equipped for their transportation are also viewed as Associated Facilities as they are not financed or owned by the Project.
Sections of the railway built for connecting to the Project facilities, and the rail stations Zavodskaya-1 and Zavodskaya-2	No	No	No	OOO Gazprom Trans is tasked by Gasprom with management and servicing of the Project rail infrastructure.
Sibur's deep hydrocarbon conversion plant	No	No	No	Ethane produced at AGPP would be utilised there.
Associated social facilities / activities:				

Facilities / Activities	Is this facility / activity funded as part of the Project?	Would this facility / activity exist if the Project was not developed?	Would the Project be viable without this facility / activity?	Comments
Social facilities associated with the apartment district in Svobodny: – School for 900 students, – Centre for Culture and Leisure, – Two kindergartens for 500 children in total (with an indoor swimming pool), – Medical centre ('policlinika') with capacity of 220 visits / day (together with a Chemist), – Administrative building (police station, post office, two bank branches, etc.)? – Firefighters station, – Boiler plant (using initially liquid fuel, but would be changed to gas later), – Engineering infrastructure (water and heat supply, wastewater collection and treatment, pump station for purified water supply, electric power supply, etc.), – Water abstraction facility in Svobodny, – Professional education bodies which are training staff for the Project and supported by GPPB, e.g., Amur Multi-Functional Centre for the Professional Qualifications (Belogorsk), Amur State University (Blagoveshchensk), etc.	No	No	No	The social infrastructure is sponsored by the Project and handed over to the Svobodnensky District administration. The Project would not be viable without the Project employees who require provision of the social infrastructure.

Figure 5.10 Isothermal tanks for transporting the liquefied helium[16]

5.10.3 OUT-OF-SCOPE FACILITIES/ACTIVITIES

A summary of activities that will not be addressed by the ESIA, typically because they fall outside of the Project's Area of Influence and GPPB's control, is provided in Table 5-6.

In particular, the Power of Siberia gas pipeline (except of the compression station KS-7a Zeiskaya) is considered as an Out-of-Scope Facility in relation to the AGPP Project for the following reasons:

(i) The AGPP Project does not include any sections of the Power of Siberia pipeline, and
(ii) The Power of Siberia gas pipeline is not directly owned, operated or managed by the Project.

Consequently, the Power of Siberia pipeline is regarded being outside of the Project's area of influence, and excluded from the Associated facilities list. The upstream gas production facilities supplying gas over the Power of Siberia gas pipeline are considered to be Out-of-Scope Facilities in relation to the AGPP Project as they are also located outside the Project's area of influence.

Examples of the out-of-scope facilities/activities related to the Project:

- Quarries and borrow pits used by the construction contractors during the construction period under agreements with the licensed quarry operators;
- Public roads/motorways and bridges, ports and airports. Although, AGPP would benefit from the planned projects for constructing bridges over the Amur River that would provide the shortest routes for exporting helium to China;
- The Amur Oblast electric power generation and distribution facilities (e.g., utilised during the construction phase and as a backup during the Project operation) is outside the Project scope. The additional power lines required for connecting the Project facilities to the power grid will be owned by the power distribution companies. AGPP would benefit from the new major power projects planned in the region. For example, a major Erkovetskaya thermal power station will be developed in the Amurskaya Oblast jointly with the State Grid Corporation of China, SGCC with total capacity 8 GW. The first phase of this power station is planned for commissioning in 2019.

[16] http://www.eastrussia.ru/news/logotsentr-obsluzhivaniya-iso-konteynerov-s-geliem-sozdast-v-primore-gazprom-gazenergoset/eastrussia.ru

5.10.4 SUMMARY OF THE PROJECT, ASSOCIATED, AND OUT OF SCOPE FACILITIES/ACTIVITIES

The Project, associated, and out of scope facilities/activities described above are summarised in Table 5-6:

Table 5-6. Summary of facilities/activities

Project Facilities/Activities	Associated Facilities/Activities	Out of Scope Facilities/Activities
Temporary facilities within the Project area during the construction period including a temporary berth at the Zeya River for transporting any oversized cargos.	Transportation of cargos required for the AGPP construction (by contractors).	Power of Siberia gas pipeline and upstream gas production facilities supplying gas over this pipeline.
Gas pipeline section connecting AGPP to the Compression Station KS-7a Zeiskaya.	Transportation of the cargos required for AGPP operation (by contractors).	The Amur Oblast electric power generation facilities / Power distribution systems outside the Project area
Gas processing plant, auxiliary facilities, and infrastructure within the Project area.	Trains, lorries, and ships equipped for transportation of the liquefied gas / Transportation of the liquefied gas.	Ports, public roads/motorways, and bridges used for transporting the commodities produced by the Project to the consumers.
Solid waste landfill designed especially for the Project operations.	Logistics bases/terminals for servicing and distributing the isothermal tanks loaded with the liquefied gases (e.g., logistics base near Vladivostok for helium distribution, and LPG trans-shipment terminal in the Vanino Port).	Waste disposal facilities other than the Project owned landfill.
Water abstraction facilities (underground water wells) and water supply pipelines.	Apartments district in Svobodny including associated social facilities (medical centre, culture and leisure centre, secondary school, two kindergartens, police and firefighting stations, water abstraction facility and engineering infrastructure).	Public railways and rail stations.
Wastewater treatment facilities of the Project contractors (construction period) and AGPP (plant operations period) including the sewage pipes for discharge of the treated wastewater to the rivers.	Sections of the railway built for connecting to the Project facilitates; rail stations: Zavodskaya-1, Zavodskaya-2, Ust-Pera.	Communal wastewater treatment facility in Svobodny servicing the Project staff apartments.
Project staff accommodation facilities owned by the Project.	Sibur's deep hydrocarbon conversion plant.	Rented accommodation for the Project staff.
		Airports near Svobodny and Blagoveshchensk.
		Quarries and borrow pits used during the construction period.

6 BASELINE CONDITIONS

6.1 EXISTING BASELINE STUDIES

An extensive range of the baseline studies has been completed in the Project area; examples of these studies are listed in Table 6-1. The complete list of baseline surveys carried out to date will be provided in ESIA.

Table 6-1 Baseline studies

Project Stage	Survey Report Name	Name of organisation carried out survey	Year
	Svobodnensky Administrative District territorial planning scheme	OOO Kariatida	2010
	Technical report on the engineering and environmental surveys for the trunk gas pipeline Yakutia-Khabarovsk-Vladivostok, Skovodino-Khabarovsk section	VNIPIgazdobycha	2011
	Technical report on the engineering and environmental surveys for the Power of Siberia trunk gas pipeline, Linear infrastructure facilities at the section KS7-KS7a	Geounzhstroy	2013
	Report on the initial Project and survey data collection scope for the Amur GPP	VNIPIgazdobycha	2014
Stage 1, The Early Works Facilities	Technical report on the engineering surveys for the Amur GPP.	VNIPIgazdobycha	2014
Stage 1, The Early Works Facilities	Comprehensive engineering surveys. The main area. Part 1: Topographical, geological, and hydro-meteorological engineering surveys	VNIPIgazdobycha	2015
Stage 1, The Early Works Facilities	Comprehensive engineering surveys. The main area. Desktop study. Technical report, Part 2: Environmental engineering surveys	VNIPIgazdobycha	2015
Stage 1, The Early Works Facilities	Technical report on the engineering surveys for the Amur GPP. Seismological studies and seismic zones in the Project area	VNIPIgazdobycha	2015
Stage 3, Auxiliary Facilities	Comprehensive engineering surveys. Desktop study. Technical report, Topographical, geological, and hydro-meteorological engineering surveys	VNIPIgazdobycha	2015
Stage 1, The Early Works Facilities; Stage 3, Auxiliary Facilities	Comprehensive survey for development of the Project documentation for the Amur GPP Project sites and external engineering auxiliary facilities. Project Documentation. Technical Report, Archaeological Studies: • Early Facilities: Archaeological studies. Development of the section on preservation of the sites of archaeological significance; • Auxiliary Facilities. Gas processing and helium complex. Accommodation. Solid waste landfill: Archaeological studies. Development of the section on preservation of the sites of archaeological significance	VNIPIgazdobycha	2015
Stage 4, Gas processing plant	Gas processing and helium complex. Comprehensive engineering surveys. Desktop study. Technical report	VNIPIgazdobycha	2016
Stage 1, The Early Facilities, Sub-Stage 2: Temporary facilities	Technical report on the engineering surveys for the Amur GPP.	VNIPIgazdobycha	2016
Stage 6: Solid waste landfill	Technical report on the engineering surveys for the Amur GPP.	VNIPIgazdobycha	2016
Stage 3.1: Auxiliary Facilities	Technical report on the engineering surveys for the Amur GPP.	VNIPIgazdobycha	2016

6.2 ENVIRONMENTAL BASELINE

6.2.1 ENVIRONMENTAL CONDITIONS

6.2.1.1 CLIMATE

In Svobodny, the climate is cold and temperate continental. It has both continental winds and monsoon streams, a combination that does not occur anywhere else in the world at the same latitude. The Köppen-Geiger climate classification is humid continental climate, Dwb. In winter, there is much less rainfall in Svobodny than in summer. The average temperature in Svobodny is -1.1 °C. The average annual rainfall is 557 mm.[17] The driest month is January, with 5 mm of rainfall. With an average of 132 mm, the most precipitation falls in July. The difference in precipitation between the driest month and the wettest month is 127 mm. The warmest month of the year is July, with an average temperature of 20.5 °C. January has the lowest average temperature of the year with an average temperature of -26.3 °C.

6.2.1.2 HYDROLOGY

The Amur Basin rivers are attributed to the Far Eastern type of the hydrological regime defined by the monsoon climate. The highest precipitation levels are usually in the summer resulting in frequent flooding. The winter flooding is usually less intensive due to lower precipitation levels.

Zeya river is the largest Amur's tributary; it is 1242 km long with the basin area of 233,000 km^2. The river basin is frequently subjected to catastrophic floods which are currently partially mitigated by the Zeya reservoir which regulates the river flow.

Bolshaya Pera river is a tributary to Zeya river with the basin of 4,400 km2 comprising 218 lakes. This river is 145 km long with 41 tributaries.

6.2.1.3 SOILS AND VEGETATION

The baseline surveys indicated that the Project area is covered by the burozem and alluvial types of soil. There are sporadic areas of permafrost within the Project area and along the RoW of linear facilities.

The baseline surveys in the Project area /Project area of influence identified 1257 species of flora with a dominance of the boreal species. Although, no protected flora species was found there. A substantial part of the Project area of influence is used for the agriculture.

6.2.1.4 FAUNA

Svobodnensky Administrative District is predominantly populated by two types of fauna: Eastern Siberian and Manchzhurian. The Eastern Siberian type of fauna is found mostly in the north-eastern part of the Project area of influence while the areas around the Zeya river are mostly

[17] http://en.climate-data.org/region/891/

populated by the Machzhurian fauna. The surveys noted presence of 388 fauna species in the Project area of influence including amphibian, reptiles, birds, and mammals, but no protected species was found there.

6.2.1.5 PROTECTED AREAS

A number of official responses received by GPPB from the local and regional authorities in the region proved that there are no protected areas within the Project area.

The Bolshaya Pera river is classed as a water body of the highest fisheries importance; this is confirmed by an official response from the Lena Basin Water Management Authority. Further details on the fisheries and water protection zones will be provided in ESIA.

6.2.2 EXISTING ANTHROPOGENIC DISTURBANCE

The agricultural lands are widely spread in the Project area of influence. Their anthropogenic disturbance is medium with changes in vegetation and mixed soil layers due to the agricultural activities.

6.2.3 IDENTIFIED HISTORICAL CONTAMINATION

The surveys did not identify any historic contamination significantly acceding the permitted levels. A detailed description of the contaminants found in the soil and their concentrations within the Project area and RoW of the linear facilities will be provided in ESIA.

6.3 SOCIAL BASELINE

6.3.1 INTRODUCTION

This Chapter provides an outline of socio-economic conditions in the Project Area of Influence. The main aspects covered in this Chapter include a description of the economic and demographic parameters, information about indigenous peoples active in the region, labour market, land use, social infrastructure, cultural heritage sites, and a number of other aspects.

This Section of the document has been developed basing on information contained in Russian OVOS materials, prepared for different Project facilities/activities; accompanying documents, provided by GPPB; socio-economic reports, developed by the local Administration and federal authorities; as well as another relevant data, received from public sources. Those sections will be significantly broadened within the international ESIA, including additional information, collected during further development of the Impact Assessment material.

6.3.2 ADMINISTRATIVE STRUCTURE

Svobodnensky Administrative District is located on the right bank of the Zeya River. The District covers 7234.4 km^2 and includes 42 settlements which are spread between 15 Village Councils (municipal entities).

6.3.3 POPULATION AND DEMOGRAPHY

Svobodny is the third largest city in the Amurskaya Oblast after Blagoveshchensk and Belogorsk. The population of Svobodny was 54,536 on 1 January 2016. The population dynamics in the city is negative because of the natural population decline and migration into the western parts of Russia (Figure 6.1; Table 6-2).

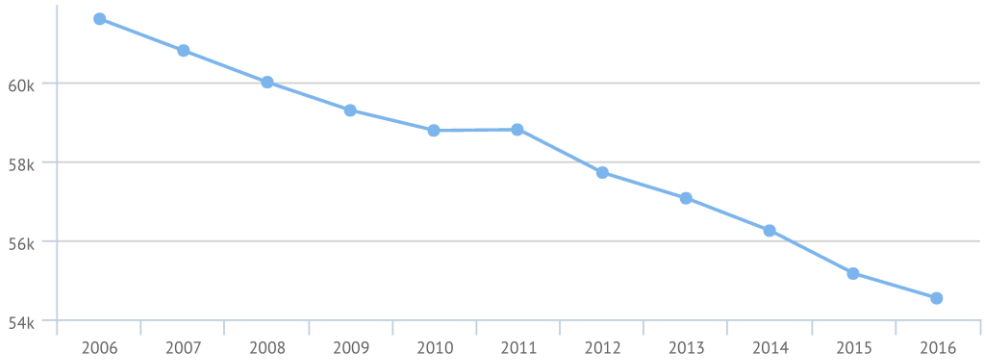


Figure 6.1 Population dynamics in Svobodny

Table 6-2 Svobodny population statistics (averaged annually)

	2012	2013	2014
Total born	690	762	724
Total died	1005	957	945
Natural population decline	315	195	221
Population density, persons per km^2	256.70	253.80	250.18
Average age in the beginning of the year	38.40	38.50	38.64
- man	35.30	35.40	35.53
- women	41.10	41.30	41.43

6.3.4 ECONOMIC SITUATION

The leading industries in Svobodnensky Administrative District are agriculture, food production, building materials production, and machinery construction. There have been 540 business entities and 1192 self-employed persons in Svobodny in the beginning of 2015.

The economic development in the District is helped by the municipal programme *'Economic Development Programme of Svobodny for 2015 – 2020'* including support to the medium and small enterprises.

The District's economy will soon get a boost with establishment of so called Advanced Development Territories (ADTs), the RF Government initiative to spur investment in this underdeveloped region. The RF Law on Advanced Development Territories (the ADT Law), enacted in December 2014 and entered into force in spring 2015 (and the related simultaneously

adopted acts that make corresponding amendments to the Tax Code and some 20 other laws) set out the “rules of the road” for these ADTs.

Under the ADT Law, an ADT is created by a government decree for a term of 70 years. Such decrees are based on a proposal by the Authorised Body. This proposal, in turn, is supposed to be based on preliminary agreements with one or more prospective investors into the planned ADT. A special federal government commission will also play a role in ADT selection and formation.

The relevant government decree will set out the main ADT parameters, including its territorial limits, types of commercial activities eligible for benefits to ADT residents, minimum investment and technology requirements, and a few other aspects. These decrees presumably will take into account the preliminary agreements with prospective investors mentioned above.

The ADT regime will address the general unevenness in development across Russia’s vast territory by incentivising investment in more depressed areas—starting with the underpopulated and relatively neglected Far East.

A special ADT will be established for the AGPP Project together with Sibur’s deep hydrocarbon conversion plant as the ADT’s residents. It would allow to diversify the local economy and provide strong grounds for its development. The package of documents for establishing this ADT is currently under consideration of the RF government.

6.3.5 LABOUR MARKET AND EMPLOYMENT

A number of settlements in the Svobodny Administrative District have overall population over 500 people of which 60% are of the working age, e.g. Zheltoyarovo, Kostyukovka, Novgorodka, etc. The largest by the population and workforce is the Malosazansky Village Council (municipal unit).

The number of people out of work in the Svobodny Administrative District in 2013 was 1220 while 4560 vacancies have been reported in the same period. The Employment Centre for the Svobodny population assists the local population with finding the employment opportunities.

6.3.6 VULNERABLE GROUPS

The areas of the traditional land use by an indigenous people groups are not present in the Svobodnensky Administrative District.

6.3.7 MIGRATION

The migration statistics in the Svobodnensky Administrative District for the first half of 2016 shows a negative dynamic with 243 persons arriving and 307 persons leaving the area.[18] No disaggregated migration data is available at the level of individual rural settlements.

[18] http://amurstat.gks.ru/wps/wcm/connect/rosstat_ts/amurstat/resources/9b9fb200420bb715af96ef2d59c15b71/07_2_2.htm

6.3.8 LAND USE

The state forestry lands occupy about 323,400 hectares which accounts about 44% of the Svobodnensky Administrative District area. The main land users in the District are the State Institution of the Amurskaya Oblast 'Stroitel', OOO Dalnefteprovod, OAO Dalnevostochnaya Kompaniya Electrosvyazi, OOO Ikat Plus. There are no areas of traditional land use by indigenous people in the District.

There are no land plots classed as forestry within the Project area. According to the RF Land Registry data, the Project Area is located on the agricultural land.

6.3.9 SOCIAL INFRASTRUCTURE AND SERVICES

There is one hospital in Svobodny with a number of branches across Svobodnensky Administrative District, and an ambulance/ medical emergency service.

There are 23 educational institutions in Svobodnensky Administrative District including: 5 pre-school institutions for 170 children in total; 18 secondary schools for 1398 children.

There is a public library in Svobodny which provides services across Svobodnensky Administrative District.

ESIA will provide a detailed analysis of the social infrastructure and services in the Project area of influence.

6.3.10 TRANSPORT INFRASTRUCTURE

Svobodny is a large transport hub at the crossroads of the rail, water and automobile transportation ways. It is a major rail station of the Zabailakskaya railway, a section of the Trans-Siberian railway. The Trans-Siberian railway is passing through Svobodnensky Administrative District stretching there for about 60 km.

The river port in Svobodny is not performing any economic activity currently. The airport in Svobodny is handed over to the forestry fire protection service and does not accept any regular passenger airlines.

Motorways are connecting Svobodny with Blagoveshchensk and other main cities in Amurskaya Oblast. The total length of the motorways in the District is 490 km of which 46 km are of the Federal importance.

There are public buses and taxies in Svobodny.

6.3.11 HOUSING AND PUBLIC UTILITIES, ENGINEERING INFRASTRUCTURE

There are 9224 houses in Svobodny with total living area 1,314,800 m^2. The largest municipal housing estate in Svobodnensky Administrative District, Orliniy is accommodating 1075 people. The engineering infrastructure includes water preparation plant, wastewater treatment facilities, communal supply of heating water, etc.

6.3.12 COMMUNITY SAFETY AND SECURITY

Natural hazards in the region are caused by extreme natural climatic conditions, e.g. extreme flooding, forest fires, high winds, sporadic permafrost. The man-induced hazards in the region are associated with major development projects including the Vostochny Cosmodrome, a new Russian spaceship launching area.

The Administration of Svobodnensky Administrative District is in charge of emergency response, civil defence, and fire protection in the District[19].

6.3.13 ARCHAEOLOGICAL AND CULTURAL HERITAGE SITES

There are no objects of cultural heritage located in the Project area according to an official response from the Ministry of Culture and Archives of Amurskaya Oblast. A detailed review of the archaeological survey results will be provided in ESIA.

[19] https://www.svobregion.ru/index.php?option=com_content&view=article&id=1684&Itemid=204

7 IMPACTS AND MITIGATION MEASURES

7.1 SOCIAL IMPACTS

7.1.1 INTRODUCTION

This section outlines the key potential socio-economic aspects associated with the construction, commissioning and operations phases of the Project. It also describes the approach to assessing and mitigating the socio-economic impacts to be taken as part of the ESIA process. In accordance with the specifics of a scoping report, this section does not intend to provide detailed evaluation of the potential impacts or description of the associated management measures, but to identify the issues that will be duly addressed as part of the ESIA.

Potential social impacts from the realization of the Project are being identified through a combination of previous, current and future stakeholder engagement activities (see Chapter 3 and specifically Table 3-1) and the performance of a systematic structured review of the Project activities in relation to the following socio-economic aspects:

- The company personnel, its contractors and local community health, safety and security, including the potential for impacts associated with:
  - Safety aspects associated with the construction and operation of the Project infrastructure and transportations (including emergency preparedness and response);
  - The presence of security services to guard the Project infrastructure and related assets;
  - Community exposure to adverse health effects, such as potential risks associated with the possibility of bringing contagious or not endemic human diseases[20]due to the presence of the Project construction workers, as well as any psychological impact experienced by local communities in the result of the Project implementation.
- Population influx, i.e. the inflow of non-local population into the Project licence area, including the workforce and opportunistic economic migrants in search of employment and business prospects;
- Land acquisition and displacement resulting from the establishment of the Project infrastructure and associated transport routes, including the potential for the impacts associated with:
  - Economic displacement.
  - Effects on indigenous lands and traditional land use practices, primarily the reindeer herding and related pastures and migration routes.
- Economic impacts, including the potential for impacts on:
  - Direct and indirect employment and additional job opportunities generation in the associated service and business sectors.

[20] Diseases not typical for the population of the region or certain territories within the Project Area of Influence

  - Indigenous livelihoods that are non-industrialised and based on the use of natural resources.
  - Fishing, hunting and gathering.
- Labour and working conditions, including the consideration of:
  - Occupational health and safety, taking account of the climatic conditions of the Amurskaya Oblast.
  - Ethics at the workplace.
  - Worker accommodation and amenities.
  - Workforce demobilisation upon completion of the main Project Stages.
  - Contractor labour practices.
- Cultural heritage, including:
  - Tangible heritage.
  - Intangible cultural heritage.
  - Cultural resources of indigenous peoples.
- Potential socio-economic benefits.

The potential impacts associated with each of the above aspects are addressed in turn in the following sub-sections, including separate consideration of the impacts during construction, commissioning and operation where appropriate. A matrix of potential impacts is given in Table B-2, Appendix B for the scoping purposes.

7.1.2 COMMUNITY HEALTH, SAFETY AND SECURITY

General Considerations

Community health, safety and security impacts and risks will be localised to the Project licence area and in particular individual onshore and offshore construction sites/areas. It is therefore not anticipated that there will be any direct adverse health, safety or security impacts on any local communities.

Construction

During construction of the Project, potential community health, safety and security impacts and risks will be primarily associated with the following aspects:

- Active construction areas. Areas of active construction with operating equipment and on-going works pose a risk to the public if access is not adequately controlled.
  - Access control methods and the establishment of appropriate alternative bypass routes and means of egress where necessary will be addressed within the ESIA and ESMPs, including both for the onshore construction sites and offshore construction areas (e.g., dredging areas). The ESIA will describe access control measures, including physical and human security measures.
  - In relation to security measures, the ESIA and ESMP will address relevant protocols (codes of conduct) for security arrangements, for example including control of the use of security dogs and firearms as well as the general principles of ethical behaviour by security personnel.

- Noise and air emissions associated with construction activities. Given the low frequency occupancy of the Project area, significant health impacts on local communities due to the elevated noise levels and air emissions are not expected.
- Construction Traffic. Increased traffic associated with construction, including the delivery of materials and personnel as well as localised movements of the equipment and machinery, may pose a potential safety risk to other users in the area. As construction equipment and materials will be transported to the Project site mostly outside the populated areas, the traffic risk is preliminarily estimated as low. Transportation of the construction personnel will be primarily by buses and cars. Nevertheless, these impacts will be considered within the ESIA, including the adoption of appropriate mitigation measures.
- Worker Influx:
  - The influx of Project workers potentially poses the risk of bringing contagious human diseases that are not endemic to the region and that may affect local communities. However, the risk of this impact is preliminary estimated as low due to the fact that all of the construction workforce will be housed in dedicated on-site residential facilities.
  - Another possible consequence resulting from the presence of a large-scale non-local workforce may be general disruption to the local lifestyle in the previously sparsely populated area. Such impacts, and associated mitigation measures, will be addressed within the ESIA. Mitigation measures to be considered in the ESIA will include medical examinations for all workers prior to deployment on site, the provision of medical facilities at the Project site and workforce vaccinations as appropriate, strict enforcement of the rigorous code of conduct for all personnel etc.

Commissioning and Operation

During commissioning and operation of the Project, community health, safety and security impacts and risks will be primarily associated with:

- Active operational sites. Active operational sites pose a risk to local communities if access is not adequately controlled. Access control methods during commissioning/operation will be addressed within the ESIA and ESMPs in a similar manner to construction (see above).
- General noise and air emissions associated with commissioning of AGPP (including flaring during the start-up) and operation. Given the low occupancy and seasonal migration frequency in the Project area, the potential health impacts on local communities will be limited. However, given the scale of noise and air emissions during commissioning and operation of the Project, such impacts on local communities will be assessed in the ESIA. The assessment will focus on the determination of the Sanitary Protection Zone (SPZ) around the Project facilities to ensure that adverse impacts to human health are not encountered (see also Section 7.2 in relation to air quality and noise impacts).
- Road traffic:
  - *Increased traffic* associated with commissioning and operation, relative to pre project levels, may pose a safety risk to local land users. The traffic risks and impacts will be considered within the ESIA, including the adoption of appropriate mitigation measures. However, transportation / shipping risks associated with the liquefied gases carriers are outside of the scope of the financed Project.
  - *Major accident hazards*. The assessment of risks associated with major accident hazards during the commissioning and operation of the Project facilities will include consideration of risks to any third party land users in the vicinity of the Project facilities.

Specifically, such third parties, if applicable, will need to be addressed within the Project's emergency response and preparedness plans.

- Due consideration will also be given in the development of *spill response measures* in the Project area. Information concerning emergency preparedness and response planning will be shared with the district and village administrations and other relevant authorities (e.g. territorial branches of the Federal Ministry of Emergencies) to ensure their awareness of the proposed measures, any planned drill exercises, requisite communication protocols, etc.

7.1.3 POPULATION INFLUX

A significant Project workforce, peaking at 15,000 personnel during construction, will be introduced to the Project licence area. It is expected that once the plant reaches its design capacity, about 3,000 people will work there.

The impacts of such influx will be mitigated as the majority of personnel will be housed in dedicated Project accommodation facilities, with the remainder being housed in satellite accommodation located close to Project facilities, and will be subject to the rigorous code of conduct. No negative impacts on regional housing are anticipated as GPPB plans to build their own accommodation.

Potential health impacts associated with the influx of workers to the area will be considered within the ESIA.

7.1.4 LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT

The Project will occupy about 800 hectares; most of this area is currently in the agricultural use. Acquisition of this land is subject to the Directive of the RF Government from 31 August 2015 №1686-r which established a procedure for acquisition of the federal and municipal land plots required for the gas transport infrastructure without a tender. The private land owners will be compensated according to the RF legislation.

There are a few permanent residential communities in the vicinity of the Project area and therefore the need in their physical resettlement will be investigated in the ESIA.

7.1.5 LABOUR AND WORKING CONDITIONS

The Project will employ a substantial workforce during the construction period: about 2,000 people in 2016; about 9,000 people in 2019; and 15,200 by 2019. The Project operations would require about 3,000 permanent staff.

Labour and working conditions will be regulated in compliance with the Project Standards, including Russian labour code and applicable ILO standards and guidelines. GPPB has overall responsibility for ensuring compliance with the Project standards, including responsibility for managing contractors' compliance in order to meet occupational health and safety standards during construction and operations. The ESIA (including the ESMP) will identify minimum requirements and a mechanism that ensures these are adopted.

In addition, proper consideration will be given to location-specific aspects including the physical and psychological health risks associated with any extreme environmental conditions occurring in the Project area.

The ESIA and ESMP will also address worker accommodation in line with Good International Industry Practice. Noise and air quality impacts on the workers' accommodation will also be assessed in the ESIA, including confirmation that the permanent accommodation areas used during operation are outside of the required SPZ. Further details of noise and air quality impacts are described in Chapter 7.2.

7.1.6 CULTURAL HERITAGE

Potential cultural heritage impacts may be associated with the disturbance or loss of either:

- Tangible resources, i.e. physical sites, structures, features, objects and parts of the natural landscape that have historical, ethnographic, spiritual, and cultural value (including archaeological, palaeontological and man-made assets).
- Intangible cultural heritage, including traditional skills, practices, customs, rituals, spiritual ceremonies and knowledge.

7.1.7 POTENTIAL SOCIAL BENEFITS

In addition to the assessment of potential adverse social impacts, the ESIA will also assess the potential beneficial social effects. Such beneficial effects include:

- Regional and local economic development.
- Direct and indirect employment opportunities (see also Chapter 7.1.4).
- Business development and spin-off effects.
- Construction and upgrade of the social infrastructure and housing.
- Educational opportunities for local community (including vocational training).

The Project will also seek to benefit the local communities through the provision of assistance via the existing Cooperation and Assistance Agreements with the regional authorities listed in Section 4.4.1.

7.2 ENVIRONMENTAL IMPACTS

This section outlines the key environmental considerations associated with the construction, commissioning and operations phases of the Project. It also describes the approach to be taken within the ESIA. However, consistent with the nature and intent of a scoping report, it is not intended to provide detailed analysis or findings, but rather outline the issues that will be fully addressed in the ESIA. A matrix of potential impacts is given in Table B-2, Appendix B for the scoping purposes.

7.2.1 ENVIRONMENTAL IMPACTS DURING THE CONSTRUCTION PHASE (INCLUDING PRE COMMISSIONING ACTIVITIES)

7.2.1.1 ATMOSPHERIC EMISSIONS

During preparatory and construction works, local air quality will be impacted by the emission of atmospheric pollutants. Air emission sources will include internal combustion engines of vehicles, construction and road machinery as well as diesel-fired power plants, boiler-houses and waste incinerators. These will lead to the atmospheric releases of hydrocarbon combustion products, primarily including: carbon monoxide (CO), oxides of nitrogen (NO_X), sulphur dioxide (SO_2), benz(a)pyrene, lead compounds, dioxins (associated with incinerator emissions) and soot/particulate matter (PM).

In addition, a significant impact on local air quality and nuisance may be caused by dust generated by the movement of construction vehicles, machinery, and also during earthworks.

When preparing this section of the ESIA for the Project operations period, a key focus will be given to activities at the Project sites associated with flaring which would represent a potentially significant source of air emissions.

Air emission sources, their locations and impact intensity will be assessed in respect to potential impacts on sensitive receptors, specifically residential areas and the most vulnerable natural complexes. Impacts will be assessed through the estimation of emission inventories, modelling assessment of the changes to local air quality levels and comparison against applicable air quality standards for the protection of human health and sensitive vegetation. Impact mitigation measures (including application of Project standards) along with air quality monitoring methods will be advanced.

7.2.1.2 NOISE AND VIBRATION

There will be a range of noise and vibration sources during construction including:

- Underground water wells drilling activities.
- Heavy equipment to be used during construction activities.
- Temporary power generators.
- Piling activities associated with the construction of pile-supported structures for the gas plant and auxiliary facilities (leading to vibration-induced underwater noise and airborne noise) and AGPP's modular facilities (also leading to noise and vibration impacts).

All primary noise and vibration sources will be identified.

Noise and vibration sources, their locations and impact intensity will be assessed in respect to the impact on sensitive receptors, such as personnel accommodation camps and both terrestrial and freshwater environment. In the event that the expected impact levels exceed standards applicable to the Project, relevant mitigation measures will be developed.

Noise modelling will be completed where necessary to confirm that relevant noise standards are met. Moreover, approaches to noise/vibration monitoring will be considered for construction activities causing significant noise/vibration levels.

7.2.1.3 IMPACTS ON SURFACE WATER BODIES

Impacts on surface water bodies are expected to occur as a result of the treated wastewater discharge during early construction and late construction/AGPP operations. More specifically, construction activities will result in the generation of sanitary wastewater, storm water, and 'hydrotest water' generated in the course of hydraulic pressure testing of pipelines, storage tanks or other equipment.

The Project ESIA will contain a description of applicable Project discharge limits and measures that will be used to ensure the standards are met. Measures will be defined in the ESIA, depending on the volume and nature of contaminants in the wastewater, but are likely to include information on site drainage controls, interceptors, wastewater treatment plants amongst other measures. Similarly, the volume and characteristics of the hydrotest waters will be described in the ESIA, for example use and concentration of chemical additives if deemed to be necessary by engineers. Disposal options for hydrotest waters will be assessed; if hydrotest water containing harmful additives is to be discharged to a water body dispersion modelling will be undertaken to optimise the hydrotest philosophy, assess the magnitude of any harm, and identify any need for mitigation measures.

Consideration will be given to impacts associated with the dredging activities in the Zeya River, especially during the removal of any river bed sediments and placement of dredge spoil within a licensed disposal area (see also Section 7.2.1.6).

In addition, consideration will be given to potential oil/chemical spills; appropriate measures aimed at preventing potential spills and their migration on the ground surface and in water bodies will be described.

Where potential impacts to surface water quality are identified, appropriate methods will be developed to monitor impacts/verify effectiveness of protection measures designed to mitigate construction impacts. Monitoring measures will be captured as part of the ESMP.

7.2.1.4 IMPACTS ON LANDSCAPE, SOILS AND GEOLOGICAL ENVIRONMENT

Construction activities may significantly impact the landscape, soils, and geological environment within the construction sites. Impacts are associated with significant volumes of earthmoving operations, soil compaction, and creation of new land relief forms. All the facilities will rest on similar rocks and substrata.

Consideration will be given to the occasional presence of permafrost in the Project area, and to potential complications that may arise during construction activities. For this reason, consideration will be given to methods to be applied for the construction of facilities/structures on permafrost rocks. In addition, appropriate measures for the prevention of permafrost degradation processes and the reinstatement on temporarily affected areas will be presented in the ESIA and within soil management plans.

Moreover, measures aimed at maintaining existing hydrology, thus preventing activation of hazardous natural processes (erosion, bog formation, flooding, etc.) as a consequence of both construction activities and changes in surface water runoff, will be detailed. Measures to monitor hazardous natural process will be proposed, as required, in areas where they are deemed likely to occur.

At the Zeya River, the construction of berthing facilities will have the potential to alter river processes. The impacts on the river processes, including accelerated erosion and sedimentation processes will be presented in the ESIA.

Potential impacts to groundwater may result from piling and drilling activities (where preferential contamination pathways to groundwater horizons may be generated) and such risks will be assessed in the ESIA and, where necessary, additional mitigation measures will be developed. Other potential sources of groundwater contamination relate to the risk of hydrocarbon and chemical spills. Pollution prevention measures that reduce the risk of spills occurring and entering the environment will be described in the ESIA.

7.2.1.5 BIODIVERSITY CONSERVATION (TERRESTRIAL AND FRESHWATER ECOSYSTEMS)

The natural complexes in the Project area are vulnerable and characterised by limited potential for self-regeneration. The region is occupied by ichthyofauna, mammals, and bird species listed in the Red-Data Books[21].

In this regard, all the environmental survey reports necessary for elaboration of design documents for each Project facility will be thoroughly studied (see also Section 6.2). Based on data currently available, and additional studies commissioned as part of the ESIA where appropriate, an assessment of the Project's impact on regional biodiversity will be completed and ecosystem services of natural complexes will be assessed.

The approach to ecological assessment and protection will be based primarily on the standards and guidance described in IFC Performance Standard 6: Biodiversity Conservation and Sustainable management of Living Natural Resources and its associated guidance. Project affected habitats will be categorised as modified, natural or critical habitats, and consistent with the entire ESIA, the mitigation hierarchy will be adopted, in which avoidance of impacts will be the preferred option. Where avoidance is not possible, measures to minimise impact and restore damage will be developed, with compensation and/or offsets for residual damage if applicable. Where offsets are required, the concept of 'no net loss' as defined in the IFC Performance Standards (PS6) will be adhered to and preference will be given to 'like-for-like' and 'in-kind' offsets to preserve the same biodiversity values.

The approach will also include full consideration of ecological value within the context of 'ecosystem services' i.e. the benefits derived from ecosystems in terms of:

(i) provisioning services, which are the products people obtain from ecosystems;
(ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes;

[21] Refers to lists of threatened Species (also known as the Red List or Red Data List), The International Union for Conservation of Nature (IUCN) maintains the IUCN world Red Data List. A series of Regional Red Lists are also produced by countries, including the Russian Federation.

(iii) cultural services, which are the non-material benefits people obtain from ecosystems; and
(iv) supporting services, which are the natural processes that maintain the other services.

Short and long term ecological monitoring requirements will be developed as part of the ESIA. Where necessary, recommendations for additional biodiversity survey studies and or conservation efforts will be specified.

7.2.1.6 IMPACTS CAUSED BY DREDGING OPERATIONS

The impacts from dredging performed in the Zeya River during the construction phase will be assessed to the extent possible within the ESIA.

The overall impact of dredging activities on both river water quality and biodiversity will depend on alternatives to be selected for carrying out of soil excavation/soil dumping works. The ESIA will give full consideration the ecological value and presence of historical contaminants in the dredge and disposal areas.

Impacts will manifest themselves in increasing turbidity levels within the river flow (due to removal/alteration of the river bed), smothering of the river bed, and temporary change in the water chemical composition that, in turn, may affect the aquatic organisms. In addition, it will be necessary to consider potential impacts on ecosystem food chains as a potential instrument of an indirect impact of the freshwater biota.

7.2.1.7 WASTE MANAGEMENT

Construction activities will result in the generation of domestic waste and industrial waste including hazardous wastes.

To effect adequate waste management, all types of waste will be identified and a Waste Management Plan (for the construction period) will be developed. This plan will comprise an estimation of expected amounts of waste generated, the description of waste generation sources, and requirements for waste handling, recycling and disposal to interim waste management facilities based on good international industry practice.

The plan will adopt the principles of ‘waste management hierarchy’ that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes and also environmental protection in terms of protection of:

- Soils and water resources.
- Air quality (in the case of incineration).
- Human health and safety.
- Impacts to fauna (with consideration given to scavenging animals).

Dedicated waste management facilities will be constructed for the Project including a solid waste landfill. In the interim period, wastes will be either recycled, incinerated, temporarily stored or transported to existing landfall sites.

7.2.2 ENVIRONMENTAL IMPACTS DURING THE COMMISSIONING AND OPERATIONS STAGES

7.2.2.1 ATMOSPHERIC EMISSIONS

During the Operations period, main air emission sources will be concentrated in: the main gas processing plant; gas-turbine generators; tanks for storing gases, etc. During commissioning, and to a lesser extent during upset/maintenance conditions, emissions from flaring activities will also occur.

Thus, the bulk of air emissions will be associated with fuel combustion operations that will emit NO_x, SO_x, CO, CO_2, PM, and hydrocarbons. Fugitive volatile organic compound (VOC) releases will also be associated with the gas processing systems, liquefied gases loading, breathing/working losses from gas storage tanks and cargo vessels.

Air emission sources (based on a range of operational scenarios), their locations and impact intensity will be assessed in respect to an impact on sensitive receptors, specifically, residential areas and the most vulnerable natural complexes.

An inventory of all air emission sources will be completed, modelling of dispersion of contaminants will be carried out, and the predicted air quality impacts will be assessed against applicable air quality standards for the protection of human health and sensitive vegetation. In addition, recommendations relating to a sanitary protection zone (SPZ) for each facility will be issued as required under RF regulations. When preparing this section of the ESIA, impact mitigation measures, including application of best available techniques along with air quality monitoring methods will be identified.

Emissions of greenhouse gases (GHG) during commissioning and operation will also be assessed, including CO_2 emissions from combustion of hydrocarbon, and fugitive emissions of other GHG, principally methane (CH_4). Measures to reduce GHG emissions will be optimized through measures such as good housekeeping (minimising fugitive emissions), a flaring strategy that reduces emission from flaring (and venting), and on-going quantification of GHG emissions during operations.

7.2.2.2 IMPACTS OF NOISE, VIBRATION AND ILLUMINATION

The main noise and vibration sources at all the facilities during the operational will be:

- The AGPP trains.
- Flaring (during Project commissioning, operations, and upset/maintenance conditions).
- Other operational machinery (mobile gas-fired power plants, boiler-houses, etc.).
- Transport.

Noise modelling will be completed where necessary to confirm that relevant Project noise standards are met. In the event that the expected impact level exceeds standards applicable to the Project, relevant mitigation measures will be developed. Moreover, approaches to noise/vibration monitoring will be considered for AGPP facilities under operation.

The potential impact of lighting at Project facilities on fauna (and in particular migratory bird species) will be considered, and appropriate mitigation measures will be developed, where necessary.

Vibration induced impacts are expected to be negligible once piling activities have been completed.

7.2.2.3 IMPACTS ON SURFACE WATER BODIES

Operations of all facilities will result in the generation of process wastewater, sanitary wastewater, and storm water. Impacts on surface water bodies will take place in the course of wastewater discharge to the water bodies. The ESIA will contain a description of all water treatment plant that will provide treated waste water quality in conformity with applicable standards. The ESIA will give particular consideration to the protection of aquatic organisms during the discharge of treated wastewater to the rivers.

Relevant methods will be proposed to monitor the impacts of both the main Project facilities and supporting infrastructures with the potential to affect the surface water quality and hydrology.

7.2.2.4 IMPACTS ON SOILS AND THE GEOLOGICAL ENVIRONMENT

The management measures initiated during construction will continue in the operations period. As such, soil management measures developed for the construction phase will also be implemented during operations, albeit with amendments that reflect the different activities associated with the operations phase. Ongoing restoration of previously disturbed areas will be central to the operations phase soil management.

Similar to the construction phase, appropriate methods for prevention of permafrost degradation and activation of hazardous natural processes will be assessed. Based on an assessment of expected impacts, methods to monitor detrimental natural processes in areas of their most probable initiation/activation will be proposed.

Potential impacts to groundwater during the operations period may result from pathways from the contaminated surface to groundwater horizons in case of hydrocarbon and chemical spills. Pollution prevention measures that reduce the risk of spills occurring and entering the environment will be described in the ESIA.

7.2.2.5 BIODIVERSITY CONSERVATION (TERRESTRIAL INCLUDING FRESHWATER ECOSYSTEMS)

For projects of this nature the construction period will typically present the major risks to biodiversity. However, there will remain a potential to impact biodiversity through the operation of the Project, including associated infrastructure, as a result of:

- Ongoing air emissions and wastewater discharges.
- Disturbance of fauna, both intentional and unintentional.
- Transportation including ongoing road traffic movements.
- Introduction of scavenging and/or invasive species.

- Noise and vibration.
- Illumination.
- Impacts associated with induced access etc.

The same approach to the assessment and management of ecological impacts described for the construction phase will also apply throughout the operations phase. Thus, based on the findings of existing surveys of flora and fauna in the region, and potentially additional focused surveys as required, the impact of the Project on regional biodiversity will be assessed along with an assessment of ecosystem services of natural complexes.

The ESIA will make recommendations for terrestrial flora and fauna monitoring within the Project's Area of Influence as necessary.

7.2.2.6 WASTE MANAGEMENT

Wastes to be generated during the Operations period will comprise domestic waste and industrial waste of various hazard classes. To facilitate appropriate waste management, all types of wastes will be identified, and a Waste Management Plan will be developed.

The ESIA will describe the waste disposal options available to the Project including dedicated sloid waste landfill. The waste management facilities will be designed and operated in accordance with good international industry practice. The design of the various waste management facilities and waste management practices, relevant to environmental protection, will be described in the ESIA. Monitoring and inspection requirements will also be described.

When commissioning the Project facilities, obligatory permits for waste disposal will be obtained on the basis of waste stream data as required by the Russian legislation.

7.2.2.7 ENVIRONMENTAL RISKS

The ESIA will consider the environmental risks arising from the Project operations including the consequences of natural events such as flood risk and seismic activities. The ESIA will also consider the risks to the Project posed by climate change.

The findings to be obtained will be used when preparing:

- Hydrocarbon and Chemical Spill Response Plan,
- Emergency Response Plan, and
- Flood Protection and Mitigation Plan.

7.3 CUMULATIVE IMPACTS

Cumulative impacts are described as those impacts from other existing, planned or reasonably defined developments that will result in the incremental impact on areas/resources also used or directly affected by the Project.

The ESIA will seek to identify other existing or planned projects that have the potential to result in incremental impacts. Other projects will be described and cumulative impacts assessed at a qualitative level, based on an understanding of any such projects at the time the ESIA is prepared.

7.4 ENVIRONMENTAL AND SOCIAL MANAGEMENT

GPPB will establish management programmes that describe mitigation and performance improvement measures and actions that address the potential environmental and social risks and impacts identified through the ESIA process. These programmes will include procedures, practices and plans to ensure that all environmental and social aspects of the Project are managed in a comprehensive and systematic way. The programmes will apply across the Project, including both GPPB and the contractors over which it has control.

In particular, GPPB will produce the following as part of the ESIA package:

1. Environmental and Social Management Plan (ESMP):

An ESMP comprising a suite of individual environmental and social management plans (MPs) will be developed that define the Project's environmental and social requirements and how these requirements are to be managed throughout the Project development. In particular, the MPs will describe:

- The organisational approach to environmental and social management, including definition of roles and responsibilities.
- The environmental and social standards to be applied.
- The specific management, mitigation and monitoring measures to be implemented.

Recognising the dynamic nature of the Project, the MPs will be responsive to changes in circumstances, unforeseen events, and the results of monitoring and review.

2. Environmental and Social Action Plan (ESAP):

The ESAP will describe and prioritise any additional actions needed to enable the development and implementation of further relevant mitigation measures, corrective actions and/or monitoring measures necessary to manage the environmental and social impacts and risks identified in the ESIA. Additional actions captured in the ESAP will typically be those actions that require additional time for their full development after the finalisation of the ESIA.

These plans will sit within the Project's overarching management systems, including GPPB's Environmental Management System (EMS) that would be developed to the international ISO14001 standard.

8 ESIA WORK PLAN

8.1 WORK PLAN

As described in Chapter 3, engagement with interested stakeholders is required during the ESIA process. This includes disclosure of appropriate information and consultation with stakeholders at various stages of the process. Disclosure and consultation of ESIA materials will be undertaken in compliance with the Lenders' policy requirements. The main disclosure materials are listed below.

Stakeholder Engagement Plan (SEP) – this plan will be disclosed in the public domain in accordance with Lenders' requirements. The SEP will be revised periodically during the course of the Project.

Scoping Report – this report is produced to give stakeholders an understanding of a proposed project during the planning stage. The Scoping Report will be made available to legitimate stakeholders in the manner described in the SEP and form the basis for continuing consultation activities.

ESIA Report – the report will amongst other matters, provide a comprehensive Project description, outline the applicable legislative framework, baseline environmental and social setting, assessment of potential impacts and mitigation measures to minimise or avoid adverse impacts and maximise benefits. In addition to the main ESIA report, the overall ESIA package will also include:

- A Non-Technical Summary (NTS - this is a standalone document that will provide a simplified summary of the key findings of the ESIA report).
- The ESMPs (see also Section 7.4).
- The ESAP (see also Section 7.4).

The ESIA package will be disclosed for public consultation.

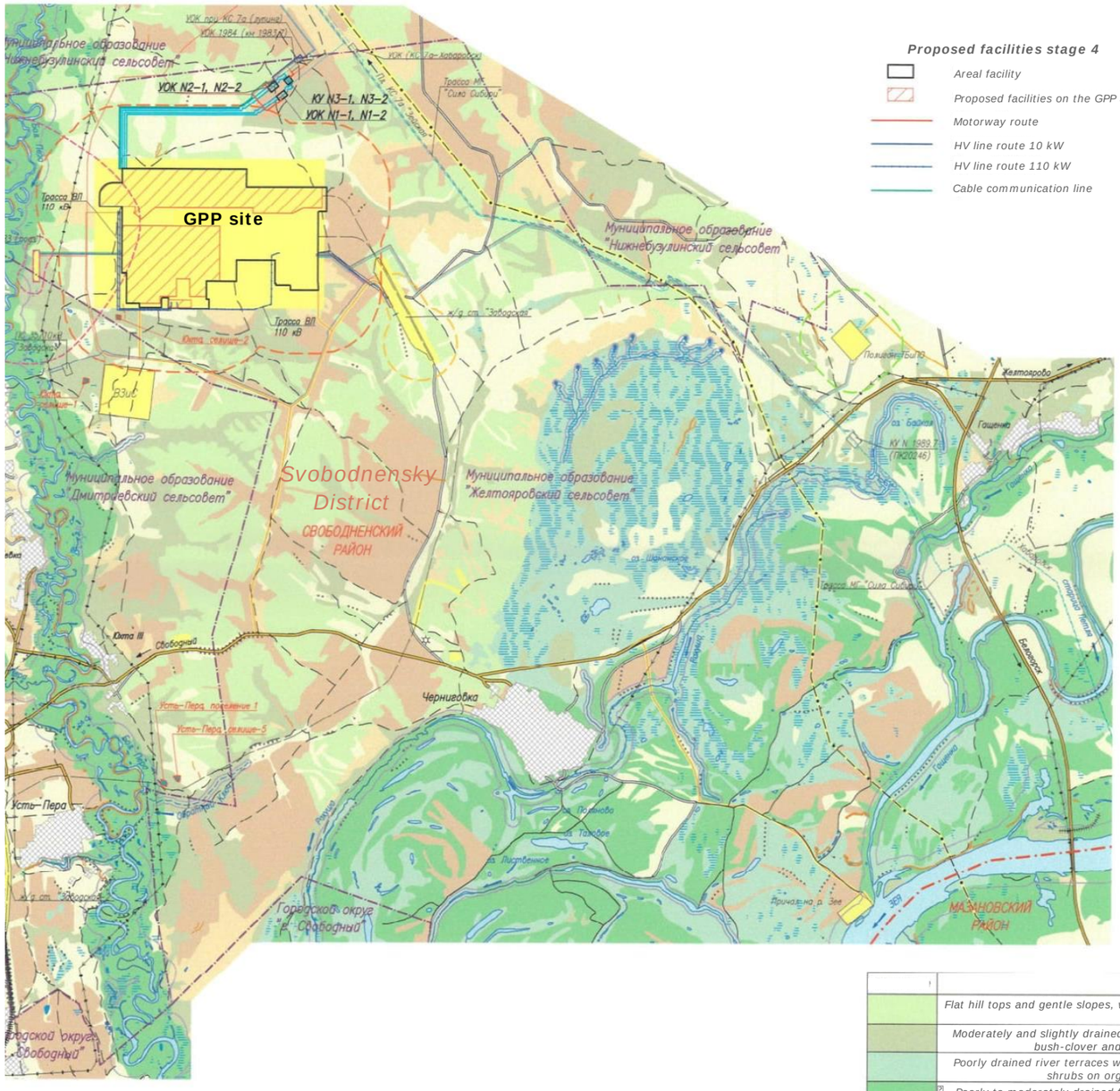
8.2 TIMEFRAMES

Indicative timeframes are provided below.

Planned activities	**Deadlines**
Disclosure of Scoping Report and Stakeholder Engagement Plan	Q4 2016
Disclosure of ESIA package for consultation including: • ESIA Report • NTS • ESMPs • ESAP • SEP	 Q4 2016 Q4 2016 Q4 2016 Q4 2016 Q4 2016
Finalisation of ESIA Package	To commence after the disclosure period (typically 60 days at the discretion of Lenders)

ANNEX A: FIGURES

Figure A-1. Amur GPP Site Plan and Natural Landscape Complexes



Legend

Proposed facilities stage 4

- Areal facility
- Proposed facilities on the GPP area
- Motorway route
- HV line route 10 kW
- HV line route 110 kW
- Cable communication line

Proposed facilities other stages

- Areal facility
- Motorway route
- Railway route
- HV line route 10 kW
- Gas pipeline route
- Sewage conduit route
- Offsite communications
- Water conduit route
- Main gas pipeline «Power of Siberia» facilitie

Existing facilities

- Hard-surfaced roads
- Unsurfaced roads
- Dirt field roads and forest roads
- Railway
- Power line 100 kW
- Forest belt
- Main oil pipeline ESPO
- Settlement
- Back-yard farms and gardens
- SDW landfill

Hydrography

- Water stream
- Water pond
- Swampiness
- Source

Other designations

- Water protection zone boundary
- Sanitary protection zone boundary (calculate and preliminary)
- Regulatory sanitary protection zone boundar domestic and industrial waste landfill
- Protective sanitary zone boundary of water c
- Sanitary protection zone boundary (calculate and preliminary) of Zavodskaya railway stati
- Municipal entities boundary
- Administrative districts' boundary
- Precipices, ravines
- Archaeological heritage site

	The name of natural habitat
	Flat hill tops and gentle slopes, well drained, covered with cherry birch forests with bush-clover ground cover on mor-humus and typical brown soils
	Moderately and slightly drained lower parts of wall slopes and bottoms of gullies with white birch forests with bush-clover and reedgrass ground cover on mor-humus and typical brown soils
	Poorly drained river terraces with swamps dominated by woodreed, cotton-grass and sedges vegetation and shrubs on organic (peaty) and associated soils underlain by loam deposits
	Poorly to moderately drained floodplains with combination of willow shrubs and meadow swamps on alluvial stratified soils underlain by loam and sand deposits
	Middle-aged areas affected by forest fires on watershed slopes on typical brown soils
	Sedge-graminoid fallow land affected by growing willow, pine and birch on brown soils

ANNEX B: TABLES

TABLE B-1. STATUS OF THE AMUR GPP PROJECT

Project Stage	Project Sub-stage	Lot	Works Area	Scope of Work	PD Status	DD Status	Construction Status
Stage1: Early Works Facilities	1	1	Temporary access roads to GPP and TSF	• Falling of trees and underwood • Removal of topsoil • Levelling of the area • Construction of temporary roads	100%		100%
		2	GPP area	• Falling of trees and underwood • Removal of topsoil • Levelling of the area	100%		100%
		3	TSF area	• Falling of trees and underwood • Removal of topsoil • Levelling of the area	100%		100%
	2	1	GPP area	• Levelling of GPP area			2.12%
		2					1.78%
		3					0.29%
		4	Access motor roads (road 4 to Zavodskaya station, road 6 to temporary jetty at the Zeya River)	• Construction of roads			14.79%
		5	TSF area	• Construction of fencing, check point and hard-faced lay-down area			0%
		6		• Construction of foundations, erection of steel structures of modular buildings			0%
		7		• Construction of foundations, erection of steel structures of infrastructure facilities			0%
		8		• On-site passages, levelling and landscaping			0%
		9		• Erection of process pipelines			0%
		10		• Construction of foundations, erection of steel structures			
	3		TSF area / temporary access roads / temporary communications and utility networks	Construction of: ▪ Areas for temporary storage of equipment and for the period of construction (supplies, temporary customs control areas) ▪ Temporary administration and service building ▪ Areas for layover and storing on the way of heavy-weight and oversized cargo ▪ Supplementary access roads ▪ Temporary power supply for construction areas, security	In progress / Estimated date of DD completion is September 2016		0%

Project Stage	Project Sub-stage	Lot	Works Area	Scope of Work	PD Status	DD Status	Construction Status
				and fire alarm of Amur GPP ▪ Shop floor communications and telecommunications ▪ Information infrastructure ▪ Temporary on-site roads for the time of construction ▪ Temporary utility networks for the period of construction ▪ 6 temporary check points			
Stage 2: Development of Railway Infrastructure	1		Ust-Pera station, Zabaikalskaya railways, RZD branch	Construction of the public railway infrastructure of Ust-Pera station	100% Issued to FAU Glavgosexpertiza for review based on RZD resolution		
	2		• Zavodskaya rail station • Zavodskaya-2 rail station and railway haul to GPP	Development of non-public railway infrastructure composed of: • Zavodskaya, Zavodskaya-2 stations • Railway haul from Zavodskaya-2 station to GPP site	100% 16.11.2015 positive result of non-public expert review of Design Documentation (non-electrified railways). 15.04.2016 - Complete Design Documentation issued to Amurgoseksertiza (regional	0.6%	

Project Stage	Project Sub-stage	Lot	Works Area	Scope of Work	PD Status	DD Status	Construction Status
					State Expert Review agency) for review		
Stage 3: Auxiliary facilities	1		Auxiliary facilities areas	Construction of on-site facilities: ▪ Storage facilities with two areas for unloading equipment off rail road ▪ Machine shop with area for repair of electrical ▪ Service and operation building of power supply service ▪ Water treatment facilities ▪ Sewage treatment facilities ▪ Boiler room ▪ Other auxiliary facilities and utility networks in-between Construction of off-site facilities: ▪ Interconnections ▪ Feed and product storage area, loading rack with required railway infrastructure ▪ Auxiliary off-site facilities (nitrogen/oxygen station, flare facilities, etc.) ▪ On-site power supply facilities	100% 27.04.2016 PD is transferred for State Expert Review to FAU Glavgosexpertiza (Moscow).	0%	0%
	2		Temporary jetty area on the Zeya River	River dredging (initial / annual)	In progress		0%
				Jetty construction and installation works: • 125 m long berth • 3,500 m^2 open storage • 190 m^2 temporary administration and amenity camp • Parking lot for temporary storage of vehicles with 16 slots • Check point • Mobile diesel-electric substation	100%	In progress	0%
	3		Access roads	Construction and Renovation of Access roads: • Access roads to GPP (one is adjacent to the production area, the other is adjacent to the Plant facilities); • Renovation of the section of the public motorway (to Svobodny) at the junction to the road going to Amur GPP; • Access roads to the jetty facilities, to the Zavodskaya railway station, TSF, water intake facilities area.	100% 28.04.2016 PD is transferred for State Expert Review to GAU		0%

Project Stage	Project Sub-stage	Lot	Works Area	Scope of Work	PD Status	DD Status	Construction Status
					Amurgosexpertiza (Blagoveshchensk).		
Stage 4: Gas Processing Plant			GPP area	Construction of Licensed Units: • Ethane / NGL Units; • NRU and Helium Unit; • Helium Fine Purification & Dehydration Units; • Helium Purification, Liquefaction and Unloading Construction of Non-Licensed Units: • Dehydration and Demercurisation Units; • Gas Fractionation Units: • NGL Treatment; • Booster Compressor Stations	100% 28.04.2016 PD is transferred for State Expert Review to FAU Glavgosexpertiza (Moscow)	Start-up Complex I: 10% / as a part of EPC-Contract	0%
Stage 5: Residential area			Residential area	Construction of residential area: • Administrative building; • Residential buildings for full development; • Social infrastructure facilities; • Utility infrastructure to ensure for the Residential area a 15% capacity margin for further development.	100% 01.06.2016 – design documentation is transferred for State Expert Review to GAU Amurgosexpertiza (Blagoveshchensk)		

TABLE B-2. SCOPING TABLE

Environmental and socio-economic aspects	Impacts	Receptors	Geographical scope of impact	Potential impact mitigation measures
Construction and commissioning / decommissioning				
Environmental aspects				
Air quality and climate	Air emissions from vehicles, machinery, drilling facilities, welding equipment, and power generation facilities Dust generated by earth excavation work, traffic of vehicles and construction equipment on unpaved (earth) roads Air emissions of hazardous chemical substances used in construction Energy efficiency of the equipment and electric power generation plants	Communities Terrestrial ecosystems Natural resources	Local Regional	Regular maintenance of machinery and engines Traffic management plan aimed at minimisation of impacts of automotive exhaust fumes
Geological environment	Impact on geological formations during the underground water wells drilling resulting in disruption of natural integrity of geological formations (interference with formation geology), changes in temperature regime and natural physiochemical characteristics of formations, potential crossflows of fluids, etc.	Geological formations Ground water	Local	Compliance with drilling process requirements: approved design documentation, standard process and operating procedures, etc.
Ground and surface water	Disruption of hydrological regime, in particular in permafrost soils Pollution resulting from leaks and small spills of fuels and lubes. Emergency spills of fuels/lubes and hazardous chemicals (e.g. surfactants, inhibitors, hydrate suppression agents, etc. Accidents during the underground wells construction or plugging Transfer of soil into surface watercourses Changes in hydrological regime caused by earth/ excavation works Discharge of water used for hydrotesting into pits Leaks of drilling mud from drill strings as a result of potential well hole sealing failure	Surface and ground water Terrestrial ecosystems	Local	Fuel/lubes spill prevention measures (fuelling procedures, waterproofing of fuelling sites and aboveground diesel storage tank areas, etc.) Construction in compliance with requirements for operations in permafrost conditions, compulsory construction of water diversion ditches and other drainage facilities Condition monitoring of water disposal system Provisions for temporary storage of domestic and construction waste

Environmental and socio-economic aspects	Impacts	Receptors	Geographical scope of impact	Potential impact mitigation measures
	Disposal of drilling waste into mud pits Operation of water disposal system Temporary waste storage			
Soil	Earthworks will result in disturbance and loss of soil resources Erosion caused by vegetation clearance Pollution caused by leaks and small spills of fuels and lubes/ Emergency spills of fuels/lubes and hazardous chemicals Accidents during underground wells construction or plugging	Terrestrial ecosystems Surface water	Local	Topsoil preservation Implementation of land rehabilitation plans allowing for permafrost soil specifics Erosion control measures Control of compliance standard operating/ process procedures during construction of the underground water wells
Noise, vibration, electromagnetic radiation/ illumination	Noise and vibration caused by vehicular traffic and equipment operation Electromagnetic radiation from communication systems Construction site illumination at night time	Communities Terrestrial ecosystems (fauna)	Local	Acoustic shielding of noise-generating equipment Moving of noise-generating equipment away from noise sensitive resources Planning of traffic routes with account of proximity to noise-sensitive resources and time of day (light conditions)
Ecosystems and protected resources	Loss of habitats as a result of vegetation clearance and withdrawal of land for construction	Terrestrial ecosystems	Local	Vegetation recovery/ restoration, conservation of biodiversity
Waste	Waste generation, storage, disposal Lack of adequately equipped landfills	Soil Surface and ground water Terrestrial ecosystems Communities	Local, regional	Maximisation of waste re-use and recycling Compliance with RF waste management legislation
Natural resources	Import of construction materials Use of water for construction purposes and needs of construction	Soil Surface and ground water	Local, regional, national – depending on supply	Sustainable management of water resources

Environmental and socio-economic aspects	Impacts	Receptors	Geographical scope of impact	Potential impact mitigation measures
	camps, hydrotesting, and equipment cleaning Fuel for vehicles and equipment	Terrestrial ecosystems Communities		Maintenance of vehicles and equipment to reduce fuel consumption and increase fuel efficiency
Social and economic aspects				
Imported construction labour	Presence of a large number of imported workers (primarily during construction) may cause tensions in relations with the local community Unfavourable impacts may include: • tensions in relations with the local community (particularly if these workers belong to a different ethnic group); • potential violence hazards; • potential spread of infectious diseases, STD (sexually transmitted diseases), prostitution; • potential growth of alcohol and drug abuse; • potential (though insignificant) increase of load on the existing infrastructure (healthcare facilities, primarily to provide medical services for construction personnel).	Local community health Religious and ethnic composition of the population Social environment and comfort Safety of life	City level	Effective stakeholder engagement, personnel management plans (including strict rules of conduct for workers and regulations for the rotational camp operation). Implementation of medical examination procedures for imported/ newly recruited workers Consider local community attitudes in relation to increased load on the local infrastructure. The Company and Project contractors must inform the local community about facility and infrastructure construction plans.
Development of small and medium enterprises	Construction process stimulates growth of demand for local goods and services to support construction and personnel. This creates incentives for development of small and medium enterprises, which may be followed by cumulative effects on growth of incomes in related sectors.	Local labour market Community income/ earnings Small and medium enterprises of the district Agricultural sector	City and district level	A local supply system development project approved by competent local authorities is required.
Impact on roads	Potential considerable increase in the number of vehicles and traffic intensity within the Project implementation area during construction. This may result in increased noise and air pollution. Project works may affect the quality of roads (damage, etc.)	Local (district) road network	District level	Proper traffic management planning
Change of land use type	The Project provide for the use of agricultural land. The land plots were acquired on lease. Withdrawal of land may result in reduction of potential ecosystem services.	Ecosystem services	Local	Development of land withdrawal compensation programme
Use of Svobodny utility infrastructure	The Company will use for the Project construction purposes certain resources provided by local utility infrastructure (water intake facilities, solid domestic waste landfills, sewer network). The Company' operations may increase the load on local utility infrastructure affecting stability of its operation.	Utility infrastructure in Svobodny	City level	Use least loaded utility infrastructure facilities. Financing expansion or capacity building of utilities used by the AGPP Project.

Environmental and socio-economic aspects	Impacts	Receptors	Geographical scope of impact	Potential impact mitigation measures
Operation				
Environmental aspects				
Air quality and climate	Air emissions from vehicles, machinery, and power generation facilities Dust generated by vehicular traffic on unpaved (earth) roads Air emissions of hazardous chemical substances during operation of AGPP and auxiliary facilities. (including scheduled and emergency equipment shutdown) Energy efficiency of the equipment and electric power generation plants	Communities Terrestrial ecosystems (fauna) Natural resources	Local Regional	Regular maintenance of machinery and engines Traffic management plan aimed at minimisation of impacts of automotive exhaust fumes
Geological environment	Impact on geological formations during underground wells operation and maintenance, liquid waste re-injection	Geological formations Ground water	Local	Compliance with drilling and re-injection process requirements: approved design documentation, standard process and operating procedures, etc. Well condition monitoring
Ground and surface water	Leaks of chemicals used in the maintenance operations, fuel spills during refuelling the vehicles.	Surface and ground water Terrestrial ecosystems	Local	Equipment condition monitoring and timely maintenance/ repair Compliance with standards equipment operating procedures
Soil	Erosion caused by vegetation clearance Pollution caused by leaks and small spills of fuels and lubes/ Emergency spills of fuels/lubes and hazardous chemicals Accidents during the underground water wells operation	Terrestrial ecosystems Surface water	Local	Topsoil conservation Erosion control measures Control of compliance standard operating/ process procedures during the wells operation
Noise, vibration, electromagnetic radiation/ illumination	Similar to the Construction Phase			
Ecosystems and protected resources	Loss of habitats as a result of vegetation clearance and withdrawal of land for construction	Terrestrial ecosystems	Local	Vegetation recovery/ restoration, conservation of biodiversity
Waste	Similar to the Construction Phase			
Natural resources	Import of consumables Water consumption for the personnel site camps and field operations	Soil Surface and ground water	Local, regional, national – depending on supply	Sustainable management of water resources

Environmental and socio-economic aspects	Impacts	Receptors	Geographical scope of impact	Potential impact mitigation measures
		Terrestrial ecosystems Communities		Maintenance of vehicles and equipment to reduce fuel consumption and increase fuel efficiency
Social and economic aspects				
Employment opportunities for local community	New jobs for local community members. Increased earnings of the population. Stimulation of service sector development.	Local labour market Community income/ earnings City and district service sector (indirectly)	City and district level	Company HR strategy must provide for the maximum use of local labour resources.
Educational level of local community	Employment of local community members will provide opportunities for new skill acquisition.	Educational and professional community structure	City and district level	Review existing education/ training programmes and industry-specific schools and, if practical/ feasible, develop cooperation programmes
Change of land use type	Similar to the Construction Phase			
Increased local budget revenues	Implementation of the Project and growth of production contribute to budget revenue gains for the Svobodnensky Administration District and Amurskaya Oblast	Local budgets	Municipal entity, city, and district levels	Registration of the Company in the region to maximise deductions to local budgets/ economy
Implementation of social project within the city and district area	GPPB is one of the primary city and district assets. GPPB plans to implement a number of social projects under cooperative agreements with the local administration.	Social infrastructure in Svobodny and Svobodnensky Administrative District	District and city level	Development of social projects list in consultation with the local administration
Impact on archaeological sites and tangible cultural heritage	According to available information, no sites of archaeological value were identified immediately within the Project area. Cultural heritage sites exist (as per monitoring data), but at a distance from the Project area.	Archaeological sites and tangible cultural heritage in Svobodnensky Administrative District	District level	Implement Procedure for management of chance archaeological finds.